

Kwakwaka'wakw Dzaxwan: The Development and Evaluation of a Cross-cultural Oolichan
Fisheries Curriculum

by

Donna Cranmer
BEd, Simon Fraser University, 1992

A project Submitted in Partial Fulfillment
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ABSTRACT

The Kwakwaka'wakw (people who speak the Kwak'waka language) sustained themselves for thousands of years prior to contact because of their mayaxa'la – respect for the land, water (both fresh and salt) and the resources, such as the dzaxwan – oolichan that were found in their territory. This thesis describes the development of a cross-cultural science curriculum on dzaxwan, using information gained from interviews with knowledgeable elders that have participated in the annual trips to work with dzaxwan and the rendering of t'kina (oolichan oil). Traditional Ecological Knowledge and Wisdom (TEKW) and Western Modern Science (WMS) concepts are woven into the creation of the dzaxwan curriculum.

Lessons were pilot tested in the spring of 2009 with grade 6/7 students at the 'Namgis First Nation band operated T'lisalagi'lakw School in Alert Bay, BC. Evaluative techniques showed that the students understood the TEK of the people, a range of WMS concepts, and practiced mayaxala (respect for the people, the land and water, and the dzaxwan).

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CHAPTER 1: Overview of the Study

When the Transformer Kaniki'lakw, traveled around the world, he eventually returned to the place where Gwa'nalalis lived. In an earlier encounter, the Transformer had been beaten by Gwa'nalalis, who was ready for his return. Kaniki'lakw asked, "Would you like to become a cedar tree?" Gwa'nalalis replied, "No, cedar trees, when struck by lightning, split and fall. Then they rot away for as long as the days dawn in the world." Kaniki'lakw asked again "Would you like to become a mountain?" "No". Gwa'nalalis answered, "For mountains have slides and crumble away for as long as the days dawn in the world." The Transformer asked a third question. "Would you like to become a large boulder?" Again, Gwa'nalalis answered, "No, do not let me become a boulder, for I may crack in half and crumble away for as long as the days dawn in the world."

Finally, Kaniki'lakw asked, "Would you like to become a river?" "Yes, let me become a river that I may flow for as long as the days shall dawn in the world." Gwa'nalalis replied. Putting his hand on Gwa'nalalis' forehead and pushing him down prone, Kaniki'lakw said, "There, friend, you will be a river and many kinds of salmon will come to you to provide food for your descendants for as long as the days shall dawn in the world. And so, the man Gwa'nalalis became the river, Gwa'ni.

*Pal'nakwala Wa'kas (Dan Cranmer) 1930
(D. Cranmer, 1930)*

Gilakas'la, nugwa'am Nalaga, gayutlan laxa 'Yalis, 'Namgiyaxsaman, wanuks Gwa'ni.

Xanukwas Gwimolas dlu Owaxalagalis. Welcome, I am Nalaga, Donna Cranmer, I live in Alert Bay, a 'Namgis woman from the River Gwani. I am the daughter of Gwimolas, Vera Newman and Owaxalagalis, Chief Roy Cranmer.

I am the second of five children. I have been fortunate to have grown up in a very culturally and politically active family. My father has been a member of the 'Namgis Band Council for over thirty years as well as a commercial fisherman. My mother initiated the first cultural program in the Nimpkish Nursery School in the early 70's and has gone on to teach cultural classes to; elementary, secondary and college students. I have heard our Kwak'wala language all my life, but am not a fluent speaker. With my research into the traditional practices of dzaxwan (oolichan fishing and rendering the oil – t'fina) my goals are three fold: to design curriculum based on local TEK, to increase my Kwak'wala proficiency, and to contribute to Indigenous scholarship in the field of TEK.

As far back as I can remember, t'lina was always a central part of my familial, social and cultural life. As a little girl I remember every summer we would go to Big Granny's (my paternal grandmother) house and we would all work on salmon. I never really thought much about it at the time, my only thought as a little girl was "I couldn't wait till I was old enough to cut the fish instead of wash the fish." She'd make us wash the fish again if we didn't get all the blood out. We would start right after breakfast. The adults cut the fish and filled the cans, usually my dad or uncle sealed the cans. The men would also be responsible to gather the wood and keep the fire burning under the 45 gallon oil drum where the canned fish were cooked. While everyone was busy working Big Granny would get the potatoes boiled and boil fish heads and tails. She would call everyone in to eat and then send everyone back out to finish filling the cans. For supper we would have barbequed fish with baked potatoes and t'lina. Usually the fire was burning under the 45 gallon oil drum where the canned fish was cooking by supper time. When the water in the drum cooled down it was the kid's job to wash the cans. Everyone had their job. It was like a mini cannery out back at my Big Granny's house. This continues today, but now we work on the fish at my sister's house since my Big Granny has passed on, and instead of a 45 gallon oil drum we use a propane cooker to cook the canned fish. This process of canning salmon is also shared in Diane Jacobson's recently published book *My Life in A Kwagul Bighouse*, (2005). My uncle once told me that "our people always adapted (to change),it made things easier."

Despite these changes in how to do things to make the work more efficient, t'lina remained a central feature of our gatherings, whether thatbe the production of it or the distribution of the precious oil. My grandparents on both sides of my family potlatch, even when a large majority of Kwakwaka'wakw gave up this important practice for a number of

reasons, not the least of which was federal statute. The majority of potlatches I saw when I was younger were memorials for family members who passed on. My Maternal Grandfather T'lakwagila, Chief Arthur Dick hosted four potlatches during his life time; a memorial for his father, an honoring of the treasures received from his daughter-in-law's uncle on my uncle's wedding night, memorial for three of his relatives and finally a memorial for his mother and my little granny. The last three of his potlatches were T'finagila - T'fina potlatches, which means he gave gallons of T'fina away to his guests. My Gramp use to say, "giving away t'fina was the highest thing for a chief to do, it took a real man to have the means to be able to go and make T'fina and then give it away." In the film, T'fina – the rendering of wealth, my uncle Arthur Dick Jr. talks about T'finagila, "When you give T'fina away, you T'finagila and you can't go any higher than that in our tradition (B. Cranmer, 1999).

T'fina (oolichan oil) like the salmon is a staple in the diet of the Kwakwaka'wakw and many other First Nations on the British Columbia coast. The oil is rendered from the oolichan by many tribes on the coast. Our people use the t'fina to dip our fish into and pour into fish soup. It also has medicinal uses; when people suffer from a bad cold, they are told to heat up t'fina on the stove and then rub it on the chest then cover with a warm towel. There are stories of chiefs in our area in the 1930's giving away 100's of five gallon cans filled with t'fina. This was a big thing to do. Today this quantity of T'fina is not given away. A Chief may give away two hundred gallons or as little as fifty gallons. There are few families who still T'finagila today.

In the late 1980's my Dad started traveling to Dzawadi and make T'fina with his own crew. In 1997 when the T'fina documentary was being shot in Dzawadi, my brother Edgar who was 9 at the time and some of his cousins, who were between the ages of 8 and 10 had their own

pit and made their own T'fina with the help of one of their dad's and a few uncles. They each came home with 4 gallons. The tradition is strong and it has been handed down since time immemorial from one generation to the next.

Oolichans are smoked or preserved by salting, but the major reason to go to Dzawadi is to make t'fina- oolichan oil. I have had the opportunity to travel to Dzawadi with him and other family members and have participated in the process of rendering the oil from beginning to end. Our people were and are truly amazing, to render oil from these small oily fish. How did this process come about? Ogawa proposes that every culture has its own science and refers to the science in a given culture as its "indigenous science" (Ogawa, 1995, p.585). The knowledge it took to create the nets needed to fish the oolichan and then to process the oolichan I would consider all 'indigenous science'. The preservation of food, taking raw stinging nettle fiber and creating fishing nets are all science.

Some of the important aspects of Kwakwaka'wakw culture are; the Kwak'wala language, origin stories, our mayaxala (treat others and things the way you want to be treated) for the land, sea and sky and creatures which inhabit each. We could not look at one of these aspects without including another. Everything is connected. "'Indian Thinking' is 'seeing' things from a perspective emphasizing that circles and cycles are central to the world and that all things are related within the universe" (Fixico, 2003, p. 1).

Since I started my own family and live in my own home, we have smoked salmon with oolichan oil or salted oolichans when my Dad invites us to my sister's house where he lives. On one of the times we were invited for supper, we entered my sister's house and we could smell the salted oolichans as soon as the door was opened and my 3 ½ year old daughter says, "Emmm I love salted oolichans". I was so proud of her appreciation for our (traditional) food which our

people have been eating since Gwa'nalalis was changed into the river Gwan'i and before.

Over the past twenty years in my community of Alert Bay the number of families that continue to harvest the oolichan has continually declined. There are a number of reasons for the decline; only a small number of families have fishing boats as previously mentioned and are able to go out and gather the oolichan, and the cost to go out on the water has increased considerably. A major reason is the steady decline in the number of oolichan returning to Dzawadi every year. It is easier for some families to get their food from the local grocery store, so the knowledge of how to gather and preserve their resources is slowly being lost by some families.

I've lived in Alert Bay all my life except for the two years I lived in Burnaby to finish my B.Ed. at Simon Fraser University and for the year and a half I taught in the Bella Bella Community School. While growing up I wanted to be an elementary school teacher, but didn't pursue it until SFU brought a 3 year Native Teachers Education Program to Alert Bay in the late 80's. I wanted to integrate our culture and academics so that our children could learn about themselves and their history in our own school, unlike my own school experience which had very little Kwakwaka'wakw history or knowledge. Knowing that much of our own culture and history has been left out of our school curriculum makes me want to help educate our children about our history and help them to see what they can become.

Rationale

In 1972 the National Indian Brotherhood (NIB) issued the historic policy paper Indian Control of Indian Education. This was based on ...an educational system in which traditional and contemporary values could intertwine and provide quality education for Aboriginal students. (MacIvor, 1995, p. 73)

After this paper was presented the Nimpkish Band (now the 'Namgis First Nation) in Alert Bay established the Tłisalagi'lakw School which has been in operation for 32 years. The Namgis Education Board's plan was to offer an alternative to the program offered by School District #85 at the Alert Bay Elementary Secondary School. In 1974 the 'Namgis Education Board began to plan how they would implement more Kwakwaka'wakw culture into their new school.

At this time the 'Namgis First Nation had the vision of teaching children the knowledge that the elders had to share about the traditional territory and resources gathered in that territory. In recent years there has been a growing movement by science educators both Aboriginal and non-Aboriginal to acknowledge the value of Aboriginal knowledge. Berkes (1993) states that Traditional Ecological Knowledge and Wisdom is a subset of traditional science, and is considered a branch of biological and ecological science. As Salmon states in his article, Decolonizing Our Voices "We should be accepted as intellectual equals, and our knowledge needs to be accepted without strings attached" (1996, p. 206). Today this area of education is called Traditional Ecological Knowledge and communities such as ours, since the mid-seventies have moved to formalize traditional knowledge through our educational infrastructure. Where transmission of traditional knowledge at the abstract level, the 'Namgis, among other First Nations, have applied these concepts through local traditional practices.

The 'Namgis First Nation have lived in our traditional homeland since Kaniki'lakw the transformer was here changing things. The knowledge our ancestors had of the land and ocean which they lived on sustained them until the coming of the Europeans. They knew that the balance had to be maintained for the survival of all. With the changing times that we live in today the balance has shifted. No longer do the fishermen take just what they need, but what big business and companies will pay for. The increasingly efficient resource extraction methods

have resulted in, (but are not the sole cause of) the decrease in local Traditional Ecological Knowledge (and accompanying attitudes and value systems) of practice and customs centering on fisheries such as the oolichan.

At approximately the same time as the Native Brotherhood published their now famous education policy paper, about 35 years ago a traditional foods list along with other important cultural teachings was created with the help of local 'Namgis elders and placed in a binder titled "Seasonal Food" (Ambers, 1974). This binder was to be the base of a 'Namgis TEK in our own school. Two other binders were created; one was a photo essay of T'ina making in Dzawadi, Knight Inlet and the other drag seining on the Gwa'ni (Nimpkish River). While this was the extent to which these ideas were developed, we have much to build on when we combine these first efforts with the living memory of our community members today.

The most recent Ministry of Education document, the *Science K-7: Integrated Resource Package* (2005), has included a number of prescribed learning outcome that focuses on the Aboriginal people of BC. (See Appendix 1b for the specific areas in which Aboriginal people are mentioned in the 2005 PLO's.) This is a beginning for the First Nations students to begin to gain knowledge of their own people's science, as mentioned in Salmon's article. This acknowledgement by the Ministry of Education that First Nations knowledge needs to be included will begin to create a balance between the teaching of Traditional Ecological Knowledge and Western Modern Science.

In the article, "Bridging Native and Western Science" (1988), Pam Colorado states that, "Because we are a dominated people, our young are educated in non-Native systems. Elders are unable to speak to the young or pass on the traditional knowledge and science to their grandchildren" (Colorado, 1988, p. p.61). In 1974 the issue of passing on TEK was being

addressed by the 'Namgis Education Board of the day. With the changes in Board membership and changing priorities the original board's idea for the school has drastically changed. A struggle in the minds of many community members caused by an internalized colonial attitude which pits the idea that there needs to be either a "traditional academic" education with just the two "traditional culture" class.

We Native people have become dependent on a foreign system of thought for answers to the major cause of our destruction. In research, we try to use Western glasses, not Native glasses, to see the meaning of problems in our lives and to find solutions. (Colorado, 1988, p. 60)

Today at the T'łisalagi'lakw school the extent of traditional Kwakwaka'wakw teachings taking place includes; Kwakwaka'wakw songs, dances and a formal but limited Kwak'wala language program. The rest of the program offered at the school is like any other non-Native school in BC. Vine Deloria questions: 'How does what we receive in our educational experience impact the preservation and sensible use of our lands and how does it affect the continuing existence of our tribes?'" (MacIvor, 1995, p. 74). The 'Namgis First Nation believes that they are in control of their children's education at the T'łisalagi'lakw School, and to a certain extent, perhaps they are. However, following Deloria's question, how are the children attending T'łisalagi'lakw School learning to care for and preserve the lands in the traditional territory of the 'Namgis, and how does this lack of teaching diminish the continuation of the 'Namgis First Nation traditional teachings, beliefs and values?

A main Kwakwaka'wakw teaching is "mayaxala" which means to treat others or things the way you want to be treated. Today some people use the English word "respect" to define mayaxala. Prior to contact a major Kwakwaka'wakw teaching was to give words of thanks

(words of prayer) before taking a resource from nature because if this did not happen then this resource could be taken and the people would suffer. We might well ask in what way does this lack of respect for the oolichan fishery contribute to its catastrophic collapse? To understand our peoples' way of thinking it is important to know the language. In the article "Squamish Speakers Keep Language Alive" (2005), the following statement is shared by Peter Jacobs a Squamish/Kwagul linguist, who notes that,

Squamish is more than just a collection of words: it contains the views and beliefs of his culture. If you speak English all the time, it starts to change your view of the world. It influences your way of thinking (Efron,2005).

Jacobs' observation supports the necessity of not only maintaining traditional values, but also supports the movement toward reclamation of land practices through language practices – that these two would seem to be intimately connected as we see how the fundamental value of *mayaxala*, which provided moral guidance about how to be in respectful relationship with the people and the resources of the territory has been largely forgotten in the bigger picture of resource extraction using efficient environmentally destructive methods.

Purpose

In general, this project had a two-fold purpose. The first purpose of my study was to learn Kwakwaka'wakw traditional methods of gathering, preparing and preserving dzaxwan - oolichan and the making of tina (oolichan oil); and in the process of interviewing the elder to understand how this information was passed on from one generation to another.

The second purpose was to develop and evaluate a cross-cultural science curriculum at the grade 5, 6, 7 level that would be respectful to the Kwakwaka'wakw culture and that can be

accepted for its value beside the BC Science curriculum.

Research Questions:

1. What are Kwakwaka'wakw traditional methods of gathering, preparing and processing dzaxwan - oolichans?
2. What are Kwakwaka'wakw traditional words and phrases that can be incorporated into dzaxwan -oolichan curriculum?
3. What environmental resource issues are related to the depletion of dzaxwan -oolichans?
4. How can a Kwakwaka'wakw traditional knowledge and wisdom curriculum on dzaxwan -oolichans be located within the Science K-7: integrated resource package 2005,? What traditional concepts, skills and attitudes that are consistent with western science can be integrated into a cross cultural science curriculum at the grade 6/7 level?
5. What teaching methods, strategies, and evaluative techniques are culturally appropriate? Are there examples of traditional wisdom (stories and examples) that can be incorporated into the oolichan fishery.
6. How effective are the strategies of Instruction? Increasing knowledge, skills, and positive attitudes?

Study Site

'Yalis, Alert Bay is located on Cormorant Island and is the traditional homeland of the 'Namgis First Nation. Cormorant Island is a small island 3 miles long and half a mile wide, just off of the Northeast end of Vancouver Island. It is known by some locals as "paradise island" and others as "the rock"! There are approximately 1350 people living in Alert Bay. Alert Bay is made up of a municipality on one end of the island and the 'Namgis First Nation reserve on the other. Every other person used to be a fisherman in Alert Bay prior to the drastic changes to the commercial fishing industry, caused by Department of Fisheries regulations and declining returns beginning in the 1980's. Today there are few commercial fishing boats. The major employer in the Village now is the 'Namgis First Nation, which operates the Administration office, Treaty Office, Forest Management Office, Health and Dental Centre, Elders Centre,

Alcohol and Drug Centre, T'lisalagi'lakw School, Amlilas playgroup, waste management facility, Lawrence Amber's Recreation Centre, Gwani Fish Hatchery and Youth Employment Centre.

Alert Bay is also considered the heart of Kwakwaka'wakw culture. Our community is home to one of the six traditional *gigukwdzi* (bighouses) where our ceremonies take place. The young are learning the songs and dances which are so important to the culture. There are still also a few smoke houses found in the back yards of the men and women that still go out and gather the resources which the creator has provided.

The original home of the 'Nāmgis is the Nimpkish Watershed and the Nimpkish Valley. The territory extended up to the head of Wa'as, Woss Lake and up into the mountains. (See Figure 1)



Figure 1 Map of 'Namgis Territories (Pasco, 1998).

Where the water begins to run to the west side of Vancouver Island is the agreed upon border between the 'Namgis and Mowachat. The 'Namgis began moving to Alert Bay in the 1860's and as the island became more developed as a business centre for the area it became the permanent 'Namgis village by 1914 (Galios, 1994a, p. 315).

Participants

This project involved Kwakwaka'wakw community members from Alert Bay and Port Hardy who have traveled up to Dzawadi Knight Inlet to catch dzaxwan - oolichans to barbeque, smoke, salt and make t̓ina (oolichan oil). The elders interviewed have visited Dzawadi in the

spring and participated in the oolichan fishery;

Chief Owaxalagalis	Roy Cranmer and family	'N <u>am</u> gis First Nation
Chief Tłakwagilakw	Arthur Dick and family	Mamalilikala
Chief Jack Nolie		Danaxdakw
Harriet Joseph		Ławitsis

The T'łisalagi'lakw School is run by the 'Namgis Education Board in Alert Bay. The student population changes yearly, but ranges between 80 – 100 students. Students begin at four years old in Nursery School which is a Kwak'wala immersion program, then to Kindergarten and on to Grade 1 through to Grade 7. The majority of the students who attend the T'łisalagi'lakw School are First Nations students; either members of the 'Namgis First Nation or the We-la-la-u Area Council.

With help and suggestions from the principal and teachers at the T'łisalagi'lakw School the oolichan curriculum created was taught to the Grade 6/7 students of T'łisalagi'lakw School. The Grade 6/7 class was made up of all First Nations students, 10 boys and 7 girls. The Dzaxwan curriculum was taught by the researcher with help from the Grade 6/7 teacher.

The Curriculum

In his book *Igniting the Sparkle: An Indigenous Science Education Model* (1999), Cajete states that “Indigenous science is a broad category that includes everything from metaphysics to philosophy to various practical technologies practiced by Indigenous peoples past and present” (Cajete, 1999, p. 83). The intent of the curriculum that I created was to present a balance between Traditional Kwakwaka'wakw dzaxwan – oolichan knowledge and western science oolichan knowledge. The important Kwakwaka'wakw teachings, included: preparation of the

mind, body and spirit prior to entering Dzawadi; the different methods of fishing, preserving and processing the oolichan; and the ceremonial use of this resource; reasons for the decline of the oolichans; and ways oolichans could be respected and preserved for future generations. The western science concepts taught were; the oolichan life cycle, fresh water and ocean oolichan food webs, habitat and habitat destruction, environmental issues affecting the oolichan populations, and issues of sustainability.

The Ministry of Education's *K- 7 Science Integrated Resource Package* (2005) listed a number of Prescribed Learning Outcomes that the newly created Dzaxwan curriculum fit. An example of this is in the Grade 6 Earth and Space Science: Exploration of Extreme wherein one of the PLO's describe contributions of Canadians to exploration technologies. Within the dzaxwan curriculum is a lesson on the use of the evolution of dzaxwan fishing methods in Knight Inlet. For example, prior to contact the most frequent fishing method was the use of a tagaʔ, conical net created with nettle fibre; whereas the modern fishery uses a seine net with a commercial herring net.

Methodology

It is important to mayaxala respect and acknowledge the local knowledge in the creation of the oolichan curriculum. Participatory Action Research is known for "collecting Indigenous knowledge and promoting social change in Native communities." (Hoare, Levy and Robinson, 1993, p. 51). The Kwakwaka'wakw community that participates in the annual trip to Dzawadi was gathered to discuss the questions relating to the handing down of knowledge and specifically the catching, preserving and storing of oolichans. Hall (1981) and Tandor (1989) define Participatory Action Research as "an integrated approach involving the participation of community members to investigate social reality, build local skills and capacity for the purpose

of increasing community autonomy through a process of praxis” (Hoare et al., 1993, p. 51). In his book *Qualitative Inquiry and Research Design: Choosing Among Five Traditions* (1998), John W. Creswell outlines the following steps for interviewing;

- Determine what type of interview is practical and will net the most useful information to answer research questions.
- Whether conducting one-on-one or focus group interviews, I recommend the use of adequate recording procedures, such as a lapel mike for both interviewer and interviewee or an adequate mike sensitive to the acoustics of the room.
- Design the interview protocol, a form about four or five pages in length, with approximately five open-ended questions and ample space between the questions to write responses to the interviewee’s comments.
- Determine the place for conducting the interview.
- After arriving at the interview site, obtain consent from the interviewee to participate in the study.
- During the interview, stick to the questions, complete within the time specified if possible, be respectful and courteous, and offer few questions and advice. (p. 124-125)

I recorded interviews to gather information on Kwakwaka’wakw traditional methods of gathering, preparing and preserving oolichans. I conducted one interview on my own in English. Three interviews were in Kwak’wala and questions were asked by my mother Vera Newman who is fluent in Kwak’wala. While gathering this information I documented many Kwak’wala words and phrases used during the gathering, preparing and preserving of these foods. I asked elders how this information was passed on from one generation to another. When interpreting the results of the interviews the common themes and patterns were taken from the transcripts. For example several individuals shared that their grandparents always said to take care not to throw garbage in the river, and so the theme of respect became an important teaching theme that

was explored in depth.

Archival research and document analysis were other methodologies used to gather information. Published information by anthropologists who worked among the Kwakwaka'wakw in the late 1800's and the early 1900's was also added to my data base. In addition researcher's journals were used to record information and check the accuracy of the building of models and equipment used in the processing of dzaxwan.

Evaluation of the Curriculum

There were several ways in which I evaluated the curriculum. I made observations of students' involvement and kept a journal of observations and reflections. During the first lesson students were asked to record all their dzaxwan knowledge. This same step was repeated at the end of the unit to see if change had taken place. For example student's would make scientific drawings of an oolichan, build a model of an oolichan pit with the help of a knowledgeable community member who made his own observations and shared that with me, create a life cycle chart of an oolichan, observe a map of oolichan migration routes and participate in an oolichan food chain game.

The elders that were interviewed shared the ways in which learning occurred in the traditional way and those examples were used as a guide to create evaluation methods with regards to the oolichan curriculum. For example, when learning to harvest the oolichan for t'lina making the students watched what was going on and were expected to join in on the work at hand. This informal evaluation method was used during the presentation of the dzaxwan curriculum.

Resources

Many research documents and journals, government archives and libraries, museum collections and internet websites were searched in the process of identifying and documenting information related to the oolichan. These included the following:

Alert Bay Library's collection of photograph of the Alert Bay area and information on Kwakwaka'wakw.

British Columbia Archives Victoria Kwakwaka'wakw documents, photographs, and audio recordings in their files.

Department of Fisheries and Ocean (DFO) statistics and documents provided scientific information on the by-catch of oolichans caught by draggers as well as natural history such as the life cycle of the oolichan, food relationships, habitat, migration, and conservation practices..

'Namgis First Nation Treaty Office contained a collection of information about 'Namgis land and resource use.

Nimpkish Wind Production Inc., a local film company owned by 'Namgis First Nation Tribal Council member Barb Cranmer, provided hours of film footage for review about t̓ina making at Dzawadi.

Royal British Columbia Museum in the Anthropology Department contained an extensive collection of Kwakwaka'wakw data; photographs, film footage, and written material regarding Knight Inlet in the early 1970's relating to the collection and processing of the oolichan.

U'mista Cultural Centre archived a wealth of resources relating to Kwakwaka'wakw knowledge; books, articles, video recording of elders, audio recordings of elders, photographs. They also have a library with many of the writings of early anthropologist and photographers to the area such as Franz Boas and Edward Curtis.

Limitations

A potential limitation of this study, as with all studies was the influence of bias. I was the researcher, curriculum developer and teacher and so could have been open to some bias. Knowledgeable elders were interviewed and their Traditional Ecological Knowledge and wisdom was used to create the curriculum and inform how the students were evaluated. I used their words for word responses to my questions and thus helped reduce the bias of the researcher. Also these community members shared the different teaching and evaluation methods they learned which would also be included in the curriculum. Another teacher besides myself helped pilot test the curriculum and this helped to reduce bias. Input from this teacher provided helpful additional opinions, ideas and evaluation comments. Hence several sources were used to collect the data. Another possible limitation of this project was that the focus was solely on Kwakwaka'wakw ways of using dzaxwan, oolichans. However, a focus on one tribal group provided a richer and more in-depth analysis, and other schools or First Nations in BC may use this case study to compare their ways of teaching with Kwakwaka'wakw ways of teaching and evaluating learning.

Chapter 2: The Literature Review

The Kwakwaka'wakw have gathered, processed and stored the dzaxwan at Dzawadi in the spring since time immemorial. This important knowledge has continued to be passed down since long before the arrival of Europeans on the BC coast. The focus of this chapter is to examine this important handing down of traditional knowledge and wisdom, also the teachings of caring for the land and the continuation of speaking the traditional language Kwak'wala. It is the language that connects the people to the land.

Areas to be discussed in this chapter are; “The Teachings”, which looks at the high regard which First Nations people held for resources found within their traditional territories, and an examination of Traditional Ecological Knowledge. Cross-cultural science deduction examines the importance of presenting a curriculum that has a balance of traditional knowledge with western science. The Kwakwaka'wakw like many other First Nations in Canada and the US are struggling to keep their traditional language alive. The Kwak'wala language and the traditional territory are as one. Kwakwaka'wakw ways describes who the Kwakwaka'wakw are and their important teachings and ways of interacting with all things. The section on the oolichan fishery describes the oolichan and areas in the Kwakwaka'wakw territory where they can be found. In Words of Thanks the vast amount of Kwakwaka'wakw dzaxwan knowledge that was collected by anthropologist Franz Boas in the late 1800 is examined. T'fina is a staple in the Kwakwaka'wakw diet that this is discussed in T'fina use. The steady decline in the number of oolichan returning to the Klinaklina River is discussed and its impact to the people.

Yupiaq educator Oscar Kawagley shared the following words while teaching a course in Alert Bay 2004, which his grandmother used to start Yupiaq stories with, “Nunam gainga mamkillrani – When the world's crust was thin,” (personal communication, 2004). All First

Nations in Canada have their stories of when the world's crust was thin, 'the beginning'. These stories tell and have taught the next generation of First Nations how to live on, share and mayaxala (treat others and things the way you want to be treated 'respect') all things in their territory. Continuing to hand this Traditional Ecological Knowledge and Wisdom is the focus of this paper. In her article, "Traditional Ecological Knowledge and Sustainable Development: Towards Coexistence", (2004) Deborah McGregor shares the following statement by Mohawk educator Taiaiake Alfred. "The Indigenous belief, reflecting a spiritual connection with the land established by the Creator, gives human beings special responsibilities within the area they occupy as Indigenous peoples, linking them in a "natural" way to their territory" (p. 6). The special connection that First Nations have for their land and its resources continues to be taught in Native communities throughout Indian Country.

First Nations and a growing number of non First Nations educators are beginning to see the importance of learning the Traditional Ecological Knowledge (TEK) of the original inhabitants of the land. First Nations and non First Nations students need to be exposed to the TEK of local First Nations in the schools in the Province. Many educators have begun the teaching of TEK in schools in Canada and the United States. Another teaching that is taking place in many First Nations schools today is the passing on of traditional languages.

In the land of the 'Namgis an important food is the dzaxwan – oolichan. It provides the much sought after t'lina which families still travel to the two mainland rivers in Kwakwaka'wakw territory to make each year. Families continue to preserve the dzaxwan in numerous ways—the way their ancestors have done since the world's crust was thin.

Anthropologist Franz Boas gathered information on the many uses of the oolichan among the Kwakwaka'wakw (people who speak the kwak'wala language). Information that included the

way people behaved on the river during oolichan fishing time, to preserving and serving salal berries and crabapples mixed with t'łina during the salal berry and crabapple feast, to the nets made from stinging nettle to catch the oolichan. Key points are as follows:

First Nations Education

The Alaska Native Knowledge Network developed the document, *Alaska Standards for Culturally Responsive Schools Cultural Standards for: Students, Educators, Schools, Curriculum, Communities* (2002) as a guide in the assessment of local cultural knowledge that is taught in Alaskan Native schools.

- Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.
- Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.
- Culturally-knowledgeable students are able to actively participate in various cultural environments.
- Culturally-knowledgeable students are able to engage effectively in learning activities that are based on traditional ways of knowing and learning.
- Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.

(Elmes, 2002, p. 647).

The above guiding points are an effective method to judge the success of locally developed cultural curriculum and the involvement of all of the major players; students, educators, schools, curriculum and communities. The development of such a document in British Columbia would

aid in the assessment and integration of more local First Nations knowledge in the provincial education system.

In British Columbia there is currently an under representation of Aboriginal students in high school science courses and underrepresented in the sciences (Snively & Williams, 2004, p. 1). Snively and Williams in their article, “The Aboriginal Knowledge and Science Education Research Project” cite statistics from 2003 of Aboriginal grade 12 graduates and their participation in the sciences:

An examination of Aboriginal performance and participation patterns in British Columbia over the last five years (2002) indicates that 36% to 42% of Aboriginal students graduate from grade 12. Of the Aboriginal students who graduate, 8% to 14% have taken biology 12; 5% to 8% took chemistry 12; and 2% took physics 12. (Snively & Williams, 2004, p. 1)

The low numbers of Aboriginal students taking grade 12 science courses result in extremely low numbers of students eligible to enter post secondary institutes in the science related fields due to lack of science 12 prerequisites:

Not surprisingly, Aboriginal people are very under-represented in science, technology, and health -related programs and professions” (MacIvor, 1995, p. 74). In recent years there has been a steadily increasing number of Educators who have started discussing the importance of teaching First Nations students the science of their own cultures or Traditional Ecological Knowledge. “The work of Oscar Kawagley (Kawagley, 1995) in developing creative science curriculum materials for the Yupia’q people attempts to form bridges between western science and Aboriginal knowledge systems... (Snively & Williams, 2006, p. 3).

As stated by Snively and Williams (2004), presenting elementary, intermediate and high school students with science that reflects their own peoples’ science could have a positive impact on the number of First Nations students entering post secondary science programs.

First Nations Ways of Being

When First Nations peoples discuss ‘culture’, this includes all things involved in day to day life, which includes; origin stories, the interconnectedness of all things, food gathering and preserving methods, child rearing practices, and the passing on of traditional names, songs, dances, ceremonies, and behavior on and connection to the land. These are just a few of the important examples of the different aspects of First Nations culture. Basically it is all the traditions that have brought First Nations to this time in their history. The sacredness and interconnectedness of the web of life is described by O’Sullivan as “...a common understanding (First Nations culture) that the earth is not a dead resource for human consumption but a sacred community and web of life of profound intricacy” (O’Sullivan, 1999, p.67).

In the article, “*Native History, Native Claims and Self-Determination*” (1983). Thomas Berger describes some of the values of Native people;

The culture and values of native people amount to more than crafts and carvings. Their tradition of decision-making by consensus, their respect for the wisdom of their elders, their concepts of the extended family, their belief in a special relationship with the land, their regard for the environment, their willingness to share – all of these values persist in one form or another with in their own culture, even though there have been unremitting pressure to abandon them. (p.14)

Gwich’in elder Gleb Raygorodetsky shared, “that ‘Spiritual and ethical values have been woven into this (traditional) knowledge, creating a system that has guided the people and helped them survive” (McGregor, 2004. p.6). “Indigenous science is a broad category that includes everything from metaphysics to philosophy to various practical technologies practiced by Indigenous peoples past and present” (Cajete, 1999, p.83).

Traditional Ecological Knowledge

The traditional belief that all things are connected is put forth in the following words by

Pam Colorado in her article, “Bridging Native and Western Science” (1988), “Like a tree, the roots of Native science go deep into the history, body and blood of the land (p.50). H. Michell puts forth that, “Every culture and nation of people have a way in which they understand the world in which we live – that in a sense is their ‘science,’ (Mullen, 2001, p.8).

Snively and Corisglia (2000) define Traditional Ecological Knowledge as an important type of locally based knowledge held by Indigenous and other long-resident peoples. Aikenhead (1996) lists several features when describing Aboriginal knowledge; thematic, survival-oriented, holistic, empirical, rational, contextualized, specific, communal, ideological, spiritual, inclusive, cooperative, coexistent, personal and peaceful (1996, p. 221). “Berkes (1993) states that TEK is a subset of traditional science, and is considered a branch of biological and ecological science” (Snively and Williams, 2005).

McGregor (2004) goes on to argue that “the most significant difference between Native and non-Native views of TEK is the fact that Aboriginal people view the people, the knowledge and the land as a single, integrated whole. They are regarded as inseparable” (p. 7). One criticism of TEK by western science teachers is that it is dismissed as “non-scientific” in most school curricula. Students’ opportunities to learn TEK are restricted as well because of the time and energy devoted to meeting standard curriculum requirements (Thompson, 1994, p.1).

Michie (2002) elaborates on what he believes “the aim of the science curriculum should be to promote consideration of the differing worldviews, not solely to enrich Western science but to facilitate a two-way exchange of knowledge and of cultural understanding” (p.37).

Cross-cultural Science Education

In their paper “Transcending cultural borders: implications for science teaching” (1999), Jegede and Aikenhead describe the effects of assimilation on a child when students are forced to

abandon or marginalize their own life-world concepts and replace them with new (scientific) ways of conceptualizing. By ignoring the TEK which some students may have received, this assimilation can cause various social disruptions or can alienate students from science (Jegade & Aikenhead, 1999, p. 47).

In his book *A Yupiaq Worldview: A Pathway to Ecology and Spirit* (1995), Kawagley gives the following example which illustrates the importance of cultural teachings for young students:

For the Yupiaq, knowledge and skills are derived from their human effort to develop a worldview consonant with themselves, nature, and the spiritual world, so the Yupiaq youngster develops a sense of being part of the universe as a result of his or her culture's teaching and learning. (p. 154)

Kawagley goes on to state that, "Culture has much to do with our state of mind, and the stories are necessary tools for the transmission of appropriate attitudes and values of mind" (p. 33). In the documentary film *Laxwe'sa wa – Strength of the River* (1995, my Big Granny (paternal grandmother) talks about how when the time is getting closer to fishing for salmon in our river the Gwani, my dad starts to question whether or not the salmon are coming. She says it's like its marked in his (my Dad's) brain (Cranmer, 1995). He knows when it is time for them (the salmon) to come back. In his article, "Some Issues in Providing Culturally Appropriate Science Curriculum Support For Indigenous Students" (1999), Mark Linkson acknowledges a fundamental fact which I feel applies to all First Nations people. He says to, "Value the Indigenous knowledge for what it is-wisdom of tens of thousands of years of successfully living in harmony with environments, many of which we Westerners would see as harsh and unforgiving" (Linkson, 1999, p. 8).

A strong belief among traditional Kwakwaka'wakw is that for our children to be successful in their future, they need to know where they come from (Olin, 1983). These beliefs

are also shared by Colorado's Navajo culture,

The Navajo and the Natural World are one. My great grandfather expresses that unity in this way: "The foundation, you have to know your roots - where you are coming from. It is understood that we all come from God, God created us. But you have to understand your own Indian way, where your roots are." (Colorado, 1988, p. 50)

In Linda Tuhiwai Smith's Book *Decolonizing Methodologies: Research and Indigenous Peoples* (2004). Gerald Alfred states that,

It has been said that being born Indian is being born into politics. I believe this to be true; because being born a Mohawk of Kahnawake, I do not remember a time free from the impact of political conflict. (Smith, 2004, p. 110)

In his book *The American Indian Mind in a Linear World: American Indian Studies & Traditional Knowledge* (2003), Donald Fixico argues that "once traditional American Indians learn in the non-Indian educational system they can draw upon the traditional knowledge and mainstream knowledge to put forth a modern Indian intellectualism" (Fixico, 2003, p. 18).

For our children to know their history they need to go back to the land of their people and learn the knowledge and values our old people had for the land and the resources. Cajete (1994) states that "Tribal education presents models and universal foundations to transform American education and develop a 'new' paradigm for curricula that will make a difference for Life's Sake" (Cajete, 1994, p. 27). These educators believe that TEK has to be incorporated into the science curriculum which is taught to students today. It would expose both First Nation and Non-First Nation students to First Nations science, which allowed for the survival of First Nations for thousands of years prior to contact.

When creating the much needed curriculum Judy Thompson reports of a lack of TEK in BC's Prescribed Education Curriculum, she suggests that Eber Hampton's 12 standards of education for Aboriginal students should be used as a guide. Hampton suggests that curriculum

and program development should use the following guide when developing cross-cultural science/technology units:

1. spirituality – at the centre of spirituality is respect for the spiritual relationships that exist between all things.
2. service to the community – The individual does not form an identity in oppositions to the group but recognizes the group as relatives (included in his or her own identity).
The second standard is service. Education is to serve the people. Its purpose is not individual advancement or status.
3. respect for diversity – The respect for diversity embodied in the third standard requires self-knowledge and self-respect without which respect for others is impossible.
4. culture – Indian cultures have ways of thought, learning, teaching, and communicating that are different than but of equal validity to those of White cultures. These thought-ways stand at the beginning of Indian time and are the foundations of our children's lives. Their full flower is in what it means to be one of the people.
5. contemporary tradition – Indian education maintains a continuity with tradition. Our traditions define and preserve us. It is important to understand that this continuity with tradition is neither a rejection of the artifacts of other cultures nor an attempt to 'turn back the clock'. It is the continuity of a living culture that is important to Indian education, not the preservation of a frozen museum specimen.
6. personal respect – The individual Indian's sense of personal power and autonomy is a strength that lies behind the apparent weakness of disunity. Indian education demands relationships of personal respect.

7. sense of history – Indian education has a sense of history and does not avoid the hard facts of the conquest of America
8. relentlessness in championing students – Indian education is relentless in its battle for Indian children. We take pride in our warriors and our teachers are warriors for the life of our children.
9. vitality – Indian education recognizes and nourishes the powerful pattern of life that lies hidden within personal and tribal suffering and oppression. Suffering begets strength. We have not vanished.
10. conflict between cultures – Indian education recognizes the conflict, tensions, and struggles between itself and White education
11. sense of place – Indian education recognizes the importance of an Indian sense of place, land, and territory.
12. transformation – The graduates of our schools must not only be able to survive in a White dominated society, they must contribute to the change of that society. Indian education recognizes the need for transformation in the relation between Indian and White as well as in the individual and society. [Electronic Version, Hampton]

First Nations Language

To protect their heritage, Indigenous people must control their own means of cultural transmission and education. This includes their right to the continued use and, wherever necessary, the restoration of their own languages and orthographies – Principles and Guidelines for the Protection of the Heritage of Indigenous Peoples (Battiste & Henderson, 2000, p.73)

Like many of the First Nations languages in British Columbia, Kwak'wala the language spoken by the 18 tribes that make up the Kwakwaka'wakw "is in extremis." (Powell, Anthony

& Davis, 2001 p.1) The findings by J. Powell, R. Anthony and H. Davis the consultants hired by the U'mista Cultural Centre to do a Review of the Kwak'wala language retention and renewal programs are frightening. They report that, "Without immediate community-wide changes and additional language programming Kwak'wala will become extinct. "A traditionally oral society passes its history by the spoken word. "The way things are said are intrinsic to a culture. Translations lose much of the meaning" (Colorado, 1988, p.58). Recording the Kwak'wala language has continuously taking place at the U'mista Cultural Centre in Alert Bay. Unfortunately with the passing on of fluent Kwak'wala speakers, immeasurable amounts of language is being lost. Powell, Anthony and Davis provided the U'mista with a summary chart outlining immediate action which would need to be taken by the U'mista, Chief and Council, the School and the Tribal organization. They also outlined work that should take place between 3 – 5 years. The collection of all Kwak'wala words; by using U'mista's orthography and recording fluent speakers will be of great importance when creating curriculum based on TEK.

Kwakwaka'wakw Ways

The Kwakwaka'wakw (Kwak'wala speaking people) have lived on the central coast since the time when Kaniki'lakw (the creator or transformer) was moving through the world changing things. Each one of the 18 tribe within the Kwakwaka'wakw have their own origin stories which tell the oral history of the first ancestors. The stories also tell of the connection to the land and sea. The songs, dances and language share and tell of the Kwak'wala speaking people's connection to and mayaxala (respect) for the land and sea which provided and continues to

provide what is needed to live. The following song about the Gwa'ni (Nimpkish River) talks of the k'utala-fish and sisiutl-double headed sea serpent.

K'andam sa Gwa'ni

Oyi: A-a hiya-a hiya yi-ya a
A-a hiya a hiya yi-ya a
a-a hiya-a hiya yi-ya
a-a hiya-a hiya yi-ya

A-a ganam-das tsiya-yi-yey-dla (you are the only one)
Yu-us-gamey tla-keya-a-yi-yey-dla (the wind is blowing over you)
'wala-sa k'utala yi-ya (great is the fish)
a-a hiya-a hiya yi-ya

Oyi

A-a ganam-das tsiya-yi-yey-dla (you are the only one)
Yu-us-gamey tla-keya-ayi-yey-dla (the wind is blowing over you)
Sisyu-tla yi-ya (Double-Headed-Sea-Serpent is the fish)
a-a hiya-a hiya yi-ya

Oyi

A-a ganam-das tsiya-yi-yey-dla (you are the only one)
Yu-us-gamey tla-keya-ayi-yey-dla (the wind is blowing over you)
Maxmala-k'udiya k'u-tala yi-ya (fish shimmering in the river, fish)
a-a hiya-a hiya yi-ya (W. Wasden, 2004)

The song is an example of the mayaxala shown the Gwa'ni and the creatures that live there.

Mayaxala shown to all things was the most important Kwakwaka'wakw teaching. In pre-contact time there was an understanding that the balance between people and what nature had to provide was to be maintained.

This delicate balance is no longer recognized by all Kwakwaka'wakw. There are Kwakwaka'wakw who have had the benefit of old people (elders) who continued to practice their ways during the dark years when the culture was outlawed. There are Kwakwaka'wakw whose old people rejected their culture when the government created laws which made the

practice of the culture illegal. With the introduction of the English language and Western way of thinking brought by the non-Natives, a breakdown in language and cultural traditions has occurred over time. Many traditional teachings are not taught to the young, by families. Many other factors have come to disturb the balance; for example, children spending too much time watching television or playing video games, the breakdown of families because of substance abuse, and people not getting out on to the land and learning about the traditional territories and way of life. Clearly Western values and beliefs about lifestyle in general and one's responsibility to the land and to family and community has significantly eroded the traditional values and behavior of our young people.

'Namgis elder Gloria Cranmer Webster shared that ".....Everything is connected, we don't break things up into compartments or catagories" (Webster, 1994, personal communication). This idea of connectedness is found in most First Nations beliefs. The Lakota phrase Mitakuye Oyasin means "we are all related" (Cajete, 1994, p. 26). In his book *The American Indian mind in a Linear World* (2003), Donald Fixico postulates, "Indian Thinking" is "seeing" things from a perspective emphasizing that circles and cycles are central to the world and that all things are related within the universe (Fixico, 2003, p. 1). This connectedness and mayaxala (respect) shown by the people, for the land and the sea resources is what allowed the Kwakwaka'wakw to live on the coast for thousands of years. Dr. Richard Atleo in his book, *Tsawalk: A Nuu-chah-nulth Worldview* (2004) discusses how the "Nuu-chah-nulth paid respect to the arrival of the first salmon of the season by conducting a welcoming ceremony of recognition and thanksgiving" (Atleo, 2004, p. 20). Kawagley, in his book *Yupiaq Worldview* (1995), cites Richard Nelson who stated "wherever the Native person is, that place serves as a kind of cathedral, deserving of respectful behavior" (Kawagley, 1995, p. 23).

The passing on of traditional teachings in all areas has become a growing concern with traditional Kwakwaka'wakw community members. Today food gathering and preserving methods are continued by fewer and fewer families in the Kwakwaka'wakw communities. Traditional Kwakwaka'wakw people feel that cultural teachings need to be incorporated into our own school curriculum, which is not taking place at this time

The Oolichan Fishery

According to Drake & Wilson (1991) the word “eulachon” comes from the Chinook – trade language. They go on to report that there are over twelve regional spelling variations that have been recorded (Drake & Wilson., 1991). “Eulachons are small andronomous fish that occur from the southern Bering sea to northern California” (DFO, 1999). The scientific name *Thaleichthys pacificus* means, “rich fish of the Pacific, referring to the extremely high (15%) oil content of the fish” (Drake & Wilson, 1991, p. 8). They only spawn in 30 to 40 rivers on the coast and 15 of these rivers are in British Columbia (DFO, 1999). The average length of the silvery, slender oolichan is 20 cm (Drake & Wilson., 1991, p. 8). The following map is from the UBC Museum of Anthropology Museum Note No. 32 titled, *Eucachon: A Fish to Cure Humanity* by Allene Drake and Lyle Wilson (1991). The map shows the rivers that the oolichan return to and the First Nation territories of British Columbia.

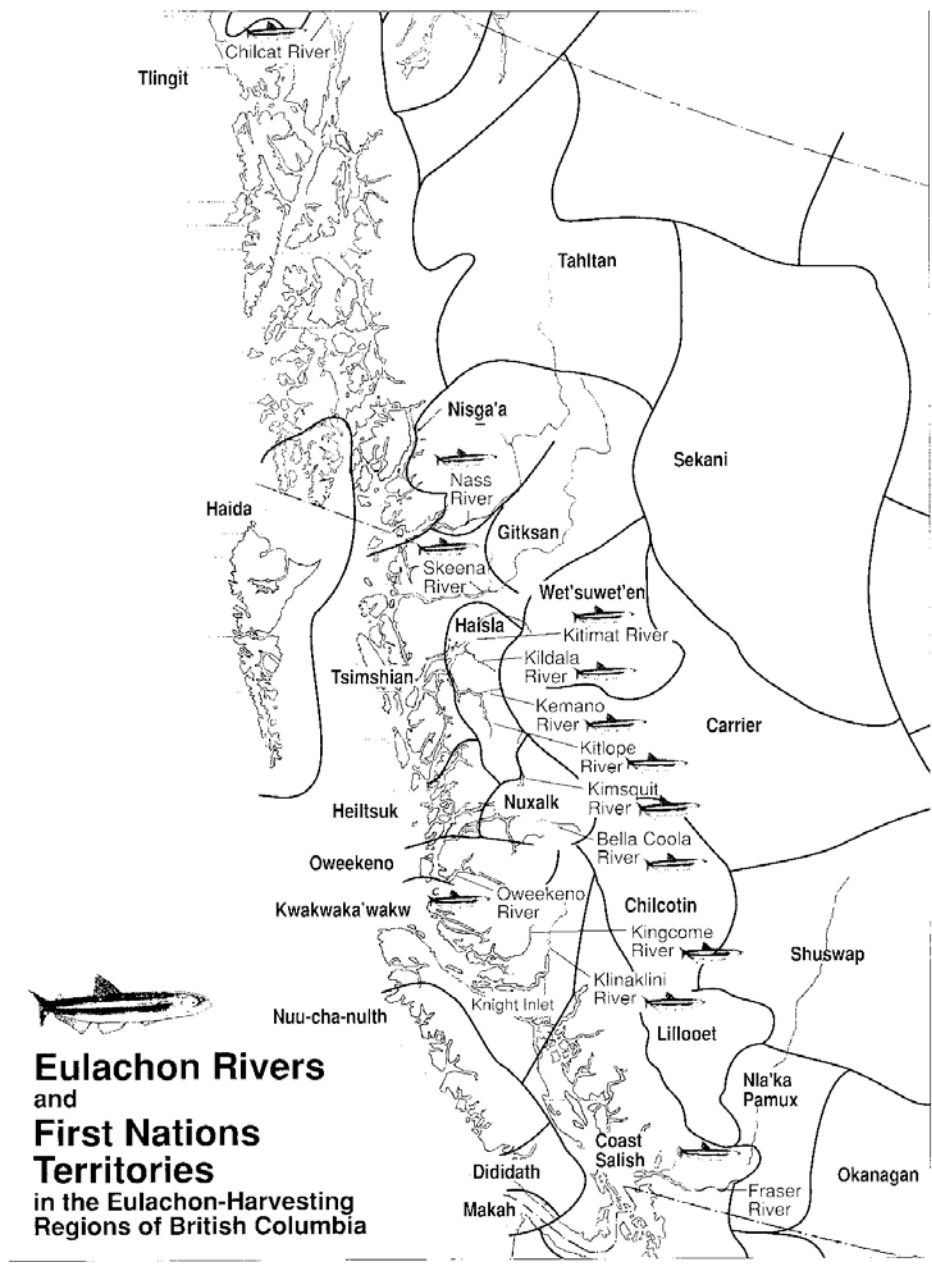


Figure 2. Eulachon Rivers and First Nation Territories in the Eulachon-Harvesting Regions of British Columbia.

Drake & Wilson give the following physical description of the oolichan, “brown to black along the back and top of the head, with light silver sides....long mouth, adipose fins, ventral fins in front of dorsal fin, and lack of barbels” (1991, p. 8-9). The female carries an average of 25,000 eggs and releases them on shallow gravel beds in the river, she is smaller and smoother than the

male, which has a rough texture (Drake & Wilson, 1991, p. 9). Predators that feed on the oolichan include seagulls, eagles, seals and sea lions, whales, porpoises, dogfish, cod, halibut and salmon (Drake & Wilson, 1991, p. 10).

In the paper, "Nutritional Qualities of Ooligan Grease: A Traditional food fat of British Columbia First Nations", Harriet V. Kuhnlein discusses the nutritional value of t'łina along with testing samples for levels of heavy metals in t'łina. "Both grease and fish are good sources of vitamin A and w-fatty acids.....Ooligan fish are good sources of CA, Fe, and Z. "The study found concentrations of arsenic, cadmium, mercury and lead in the ooligan grease, but all below guideline levels by Health Canada" (Kuhnlein, Yeboah., Sedgemore., Sedgemore., & Chan., 1996).

The sea life, particularly the salmon, the oolichan (pronounced: oo-la-kin)-a silvery, smelt like fish—and the cedar tree are among the resources in the natural environment that have long made the Kwakwaka'wakw both spiritually and materially rich. (Indian, 2006)

As previously mentioned all Kwakwaka'wakw tribes have their origin stories which tell of how their first ancestors came to inhabit their territory. The late Chief Billy Assu from Cape Mudge shared the story of how his people in ancient times after the flood came to live near the Klinaklini River for a period of time. This ancestor Weka'yi met a woman named T'łisda'k and she had wings on her back on the Klinaklini. The woman T'łisda'k eventually allowed Weka'yi to build a house and make t'łina every spring (Duff, Prior to 1965b).

Oolichan continue to be gathered on two rivers in Kwakwaka'wakw territory; the Klinaklini and Kingcome. "Traditional food keeps the link between the land and our health" (Kuhnlein, 2005.) The Klinaklini River is the traditional territory of the Awaetlala and Tenaktak. Although this territory belonged to these two tribes, during oolichan fishing time they

allowed fourteen Kwakwaka'wakw tribes to have their own camps to harvest the oolichan. See Figure 2. Oolachan sites, Klinaklini River (Galios, 1994, p. 137) which shows the fourteen Kwakwaka'wakw tribes camps.

Words Of Thanks

It is important to note that when talking about “Kwakiutl religion” as Boas calls it, I use the term words of thanks (Webster, 1987). It was explained to me that our people had three types of giving thanks, the English word prayer is now used for all of them. *The Religion of the Kwakiutl Indians Part I- Text and Part II* (find year) Translation gives words of thanks that were said for many of the day to day activities which Kwakwaka'wakw men and women participated in. Giving words of thanks was part of everyday life. Today when families leave Alert Bay to go to Knight Inlet they will stop at a place called Twin Falls. This is considered an important site to stop at on the way up to make tlna. The old people would stop and wash themselves in the falls and ask for all sickness to leave their bodies. Peter Macnair in his paper *Descriptive notes on the Kwakiutl manufacture of eulachon oil* (1971), describes the following, “Stopping halfway up the inlet to bathe ritually under the mist of a water fall at Cascade Point to ensure good health...” (p. 169). They were preparing themselves spiritually for the work ahead. Boas has

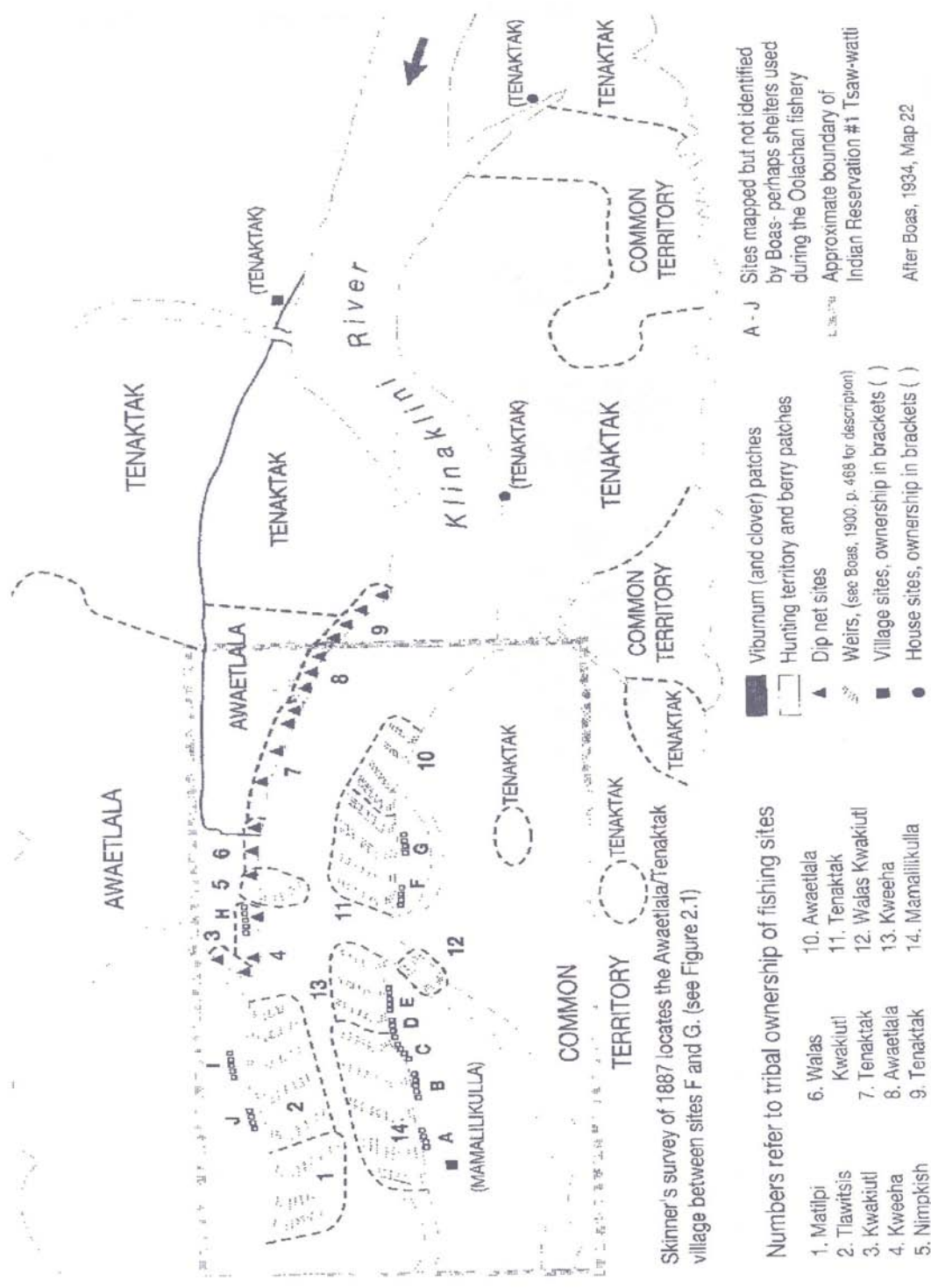


Figure 3 Kwakwaka'wakw tribe oolichan sites, Klinaklini River (after Boas, 1934, Map, 22).

collected the prayer to a waterfall at Dza'wade (1930, p. 184). Kwakwaka'wakw seasonally gathered the natural resources which surround them, always giving words of thanks before taking anything. The following words of thanks (prayer) shows the appreciation and mayaxala given to the resources which were seen as willing to give themselves to the Kwakwaka'wakw for their nourishment and life.

Prayer of a man hauling the first dipnet full of oolichen

Now you have come, grandfather,
 You fish, that you may not ill-treat me,
 That you may only bring good luck by your coming to me,
 Supernatural Ones, you Dancers,
 I pray you, Supernatural Ones,
 That we may meet again next year and,
 Please protect me, friend, you fish
 (Drake & Wilson., 1991, p. 7).

Once the words of thanks were given by the chief with the rights to catch the first oolichen he began the ritual associated with this right. Erna Gunther (1928), gives a detailed description of this ritual.

The Head Chief of the clan flyers of the Dena'xda x has the right to be the first to dip in his net when the olachen first appear.....The daughter of the chief has to be the first to string up the first olachen to dry. (Gunther, 1928, p. 172)

Creating Everyday Materials

In *The Kwakiutl of Vancouver Island* (1975), Franz Boas describes how to create food and other water receptacles, household utensils, kelp bottles, nettle neta and netting. All these items were used in the collection, storage and serving of the oolichen.

Kelp Bottles

“The best kelp (wa’wade), or bull kelp for making oil-bottles grows on rocks where there is a swift tide. The kelp is collected by women in the fall, after the berrying-season is over” (Boas, 1974 p. 407). Boas goes into great detail on the cleaning and drying of the kelp before the oil is placed in the bottles. The types of oil saved in these containers were “Olachen-oil (Le’na) t’lina, dogfish-oil (xu’lq!wes), and oil made of seal (me’gwat!es), porpoise (Ko’lot!es), whale (gwe’gis) and bear (Le’ntses), are also kept in kelp bottles. Catfish oil (dze’k!wis) is kept in small kelp bottles” (p.419).

Gathering nettle for creation of fishing nets

The gathering of nettle to create fishing nets and the creation of these nets was a women’s job.

Nettles are cut in October....Fifty stems of nettles are placed in a heap, and are tied together with split cedar-bark in four places, at about equal distances. These bundles are taken home, the tying is undone, and the stems are split with the nail of the thumb.....the nettles on it is placed on a drying-frame, where it is left exposed to sun and wind. In the evening the nettles are covered over with mats so as to keep the dew off. (Boas, 1974, p.370)

After the nettle fibre is gathered, and prepared it is then spun and finally the fishing nets are created. “In making the large olachen-net, the woman begins with the finest nettle-twine, using the small netting-needle, on which the thread is wound. First the twine is turned twice around the smallest net-measure” (p. 399). (See the detailed explanation of each in appendix 1.)

Beliefs About Oolichans

In his book *Current Beliefs of the Kwakiult Indians* (1932), Boas shared information gathered on Kwakwaka’wakw beliefs about oolichans. The following topics were found relating specifically to the oolichan; association with twins (#647), fish (#131), in fertility charm (#137),

run stop by capsizing canoe (#642), fine hail (#415a), rock slides (#416), taboo (#643-650), and net for deceased (#644). It is recorded that “if a woman carries on her back basket containing olachen, she will have twins” (Boas, 1932, p.230). Boas also recorded that, “After the ceremony an olachen net is placed over the head of the body (deceased)” (p. 215). There was no explanation to say why this was done, but this was done when laying the man’s body in a tree.

Beliefs about the supply of oolichan being foretold (#413) was also shared by my maternal grandfather, Arthur Dick Sr. in the documentary *T’lina: The Rendering of Wealth* (1999). He tells about the first moon in the new year, if the crescent moon is lying on its side (looking like a bowl standing upright) then there will be lots of oolichans in the spring, if the crescent is standing up then the oolichans are all running out and there won’t be many oolichans in the spring (Cranmer, 1999).

T’lina use

Charlie Nowell (Kwakwaka’wakw chief) discusses the making of and giving away of t’lina (as interviewed and transcribed word for word by Duff prior 1965a).

In the old days everybody used to go olachen fishing. Now not all go, even though high priced - \$15 for 4 (imperial) gallon tin. Don’t pit-ripen: make bin of boards on top of ground – if you don’t ripen (the oolichan) can’t get much grease out of....Bill Matilpi gave grease feast on June 1st past. There was a time hardly anyone went. I (got) 6 cans (\$90.00) and wouldn’t have go so many if more people hand gone maybe 3-4.

In *Ethnology of the Kwakiutl; Social Customs of the Kwakiutl Indians* (1916, 751). Boas describes feasts where t’lina was mixed with fruit: they are feasts of currants, huckleberry feast, Viburnum berry feast, salmon berry feast, crabapple feast and finally feast of salal berries and crabapples. As one example when huckleberries were gathered in the summer they would be

cleaned and then placed in a bent box and covered with water and oolichan oil. These boxes of huckleberries would be stored away for use during a huckleberry feast

'Namgis Grease Trail

“Eulachon, particularly eulachon oil, was one of the most valuable trade commodities...” (Drake & Wilson., 1991). Part of the oral history of the ‘*Namgis* tells of the ancestors U’małame walking over the mountains to the west coast of Vancouver Island and trading with the people he encountered (W. H. Wasden, 2005). The (oolichan) grease trail that U’małame created was a major trade route for the ‘*Namgis* and Nuu-chah-nulth people. Valuable items that were traded were, “red ochre, mountain goat wool, herring eggs and songs, but the most important was the precious eulachon oil” (W. H. Wasden, 2005, p. 20).

My Big Granny (Agnes Cranmer) shared stories of my paternal great grandfather Gwimolas and my paternal grandfather Dan Cranmer walking this trail. For over 80 years the trail was not used. In 1999 the ‘*Namgis* Grease trail was used to bring t’lina to the Nuu-chah-nulth at a canoe gathering in Ahousat. William Wasden Jr. composed a song after completing the journey, called the Grease Trail Song.

This song recounts the recent journey of four 'Namgis men who traveled an ancient trade route that extends from the traditional territories of the '*Namgis* tribe on the East coast of Vancouver Island, to the territory of the neighboring Mowachat tribe on the West coast of Vancouver Island (Neel, 2004, p.5).

The words of the Grease Trail song in English are as follows:

What shall we do my brothers and sisters?
Come, let's wander into the forest and begin our journey.
What shall we do my brothers and sisters?
Come, let's fly around the world as our ancestors did with their
spiritual power.

What shall we do my brothers and sisters?
 Come, let's go to the other side of our world, the West Coast.
 What shall we do my brothers and sisters?
 Come, let's hurry now and complete the things we need to do in this
 life. (Neel, 2004, p. 5)

Oolichans and the Klinaklina River

In recent years there has been a steady decline in the amount of oolichans being caught by First Nations. The Tanakteuk First Nation whose traditional territory includes the Klinaklini River, hired Biologist Michael Berry to study the oolichans in 1995 to find out what is happening to the oolichans of the Klinaklini. Berry concluded “that there were at least three runs of eulachon in the Klinaklini in 1995” (Berry, 1996). By taking samples of and finding the presence of oolichan larvae he was able to estimate when spawning took place. The possible reasons for decline in the oolichan returns are the increase in side channel blockage from large volumes of wood (stumps and logs from logging in the valley), also the recent arrival into the inlet of Pacific Whiteside dolphins which had not been seen prior to 1992 (Berry, 1996, p. 12). A concern raised by Chief Roy Cranmer in *T’lina: The rendering of wealth* (Cranmer, 1999) documentary is the reports of trawlers fishing in water around Knight Inlet and the by-catch of oolichans, that they hauled up. Trawlers fish for pollack and cod and they also get a by catch of oolichans. They have no use for oolichans so the oolichans get thrown back.

At the Bamfield Marine Station in the summer of 2006 instructor, Ann Stewart discussed with local trawl fisherman the topic of oolichan by-catch. He confirmed that he does get a by catch of oolichan. These outside influences are having an effect on the oolichan returning to the Klinaklini River. What does this mean for the future t’lina makers?

Following the Path of Our Ancestors

The Kwak'wala phrase Kas'ida'asa san's galga'lis means the path of our ancestors. The Kwakwaka'wakw have survived for thousands of years by continuing to follow the path of our ancestors. Chief Charlie Nowell's interview took place prior to 1965 when Wilson Duff was working at the Royal British Columbia Museum. He concluded his discussion about t'łina with, "We still got to have grease – can't get along without it....good for stomach – too. We eat regularly with boilers (potatoes) and dried salmon" (Duff, Prior to 1965a). Ławit'sis elder Stella Beans shares the same view about grease, in the film *T'łina: The Rendering of Wealth* (Cranmer, 1999). She states "we still gonna make grease...Stevie (her husband) to Darryl (her son) to Steven (her grandson). A strong belief and respect for the traditional teachings that is evident in the previous two elders statement. It is critical for the welfare and future of our people that this belief and respect needs to continue.

Chapter 3 Gwayi'lelas – “How We Do Things”

As discussed previously, a major focus of the current study was to document and learn Kwakwaka'wakw traditional methods of gathering, preparing and preserving dzaxwan (oolichans) and making t'lina (oolichan oil). The second purpose was to develop and evaluate a cross-cultural traditional science curriculum for grades 6-7. Dzaxwan is one of the valuable natural food resources used by First Nations up and down the British Columbia coast. Not only was this small smelt-like fish used for food, the Kwakwaka'wakw have a ceremony called T'linagila – t'lina potlatch. At such a potlatch hundreds of gallons of oolichan oil was given to guests by the host chief as payment for witnessing the passing on of his family's song, dances and names.

Gathering important Kwakwaka'wakw dzaxwan information had to take place prior to the development of a curriculum. In addition to reviewing the literature and analyzing important archival documents, I interviewed elders who had participated in the t'lina fishery and making of t'lina. This chapter provides a description of the four elders who were interviewed, and an analysis of their traditional knowledge, wisdom and experiences. Topics covered include preparations for making the trip to Knight Inlet, digging the pit, fishing techniques, cooking dzaxwan for making t'lina, healthy traditional foods, dzaxwan teachings, respecting nature—taking care of the land, depletion of a food fishery, and future hopes.

Due to the passing of each old person and the wealth of knowledge that is lost, I felt it was important to conduct as many of the interviews in Kwak'wala as possible. I consider myself a baby when it comes to my knowledge of the Kwak'wala language, due to this fact a fluent kwak'wala speaker was hired to help with the interview process. Three of the four interviews

were conducted in Kwak'wala with Vera Newman asking the questions. I conducted the last interview in English.

To transcribe the Kwak'wala interviews we would listen to the tape and Vera would translate what was being said in Kwak'wala while I typed the information in English. It was exciting to hear the natural rhythm of the Kwak'wala language as the questions were being asked and clarified. I strained to pick out words that I recognized and challenged myself to someday be able to Kwak'wala like the elders we listened to.

The dzaxwan interviews took place in August and September of 2008. All four interviewees were between the ages of 59 to 79. Three males and one female were interviewed about their oolichan knowledge. I felt that it was important to hear from both the men and ladies that make the trip each spring to Dzawadi. In Kwakwaka'wakw culture the roles are gender specific. For example, during a potlatch only men sit at the log to beat and sing. Women keep the information and as such, many women know the songs, but they do not sing at the log during a potlatch. The role each plays is equally important.

The four Kwakwaka'wakw (Kwak'wala speaking people) elders interviewed were Roy Cranmer, Harriet Joseph, Arthur Dick Sr. and Jack Nolie. Roy Cranmer of the 'Namgis First Nation is in his mid sixties and lives in Alert Bay. Harriet Joseph of the Ławit'sis Nation is in her mid sixties and lives on the Gwasala- Nakwaxdaxw reserve in Port Hardy. Arthur Dick Sr of the 'Namgis First Nation is sixty and lives in Alert Bay and Jack Nolie is from the Danaxdaxw Nation and is in his late seventies and also lives Alert Bay.

Lots of Dzaxwan

In the archival footage from the documentary film “T’lina – The Rendering of Wealth”, one can see the large amounts of oolichan that were traditionally caught. Roy Cranmer travelled to Dzawadi as a young man with his father-in-law Arthur Dick and his father’s in-law parents, Minnie and Charlie Dick. Around 1985 he started travelling to Dzawadi with his own crew to make t’lina. Roy begins his interview discussing the large amounts of oolichan there used to be on the Klinaklina River:

Well I’ll start with the gathering first. What I could gather when talking with the old people when they first used to go up to Knights Inlet, which would have been Charlie Dick. What they used to do is just pick the eulachons off the bank so they were actually spawned originally..... Most of the time back then there was lots of eulachons and that would not have taken them long to get what they needed. We used to go up there in the early sixties; I guess it would have been.

Jack and his wife remember a time when there were lots of oolichans and how easy it was to get what you needed:

Jack : There’s lots, from here to that wall, maybe about that thick with oolies.

Dot: I use to walk down to the edge of the river and just pick out what I needed.

Jack: You could just grab it and put it in the pail, there was so much....You didn’t use the tagal, you could use the kanayu (dip net) too if you want.

Before leaving for Dzawadi (Knight Inlet)

Dzawadi (Knight Inlet) is a small village consisting of about eight shacks/houses on the Klinaklina River. There is no electricity and no running water. When you go to Dzawadi you have to take everything you will need with you. There is nowhere to buy anything if you forget something important. Each of the t’lina makers interviewed discussed the amount of preparation that they and their families did months prior to leaving for Dzawadi. Harriet cooked for her family when they went to Dzawadi when she was younger. Harriet shared how her mother would get her gear ready:

There is a lot, what my mom use to have to prepare. Washing and getting her pails ready, cause that's the most important thing that you use up there, the pails. She goes on to say that,

It takes a lot of preparation, before you go up.....My mother use to put her food in pails. She did all kinds of things (to get ready) to go up there. Harriet's mother would gather traditional food and preserve it for the annual trip to Dzawadi:

My mom did all kinds of things, we never ever bought jam from the store. All the time I was growing up, we use to go picking berries sometimes with my mom..... that's what she brought to Dzawadi, she jarred fish and clams.....so that we could bring it to Dzawadi. It's so different now...

Arthur travelled to Dzawadi with his grandparents when he was a young boy and he continues to make t'lina today, teaching his own son and nephews. He talked about going to Dzawadi with his father one time and how important it is to always pay attention to what you're doing:

I left with my Dad and we got up to Dzawadi and we had no kidzayu (matches). We were really embarrassed. That's what happens when you don't pay attention to the preparation when you're going to Dzawadi. That's the most important thing you need.

Kwakwaka'wakw Traditions

As families travel up Knight Inlet and get closer to the mouth of the Klinaklina River they stop at a spot called Twin Falls (Cascade Point). The old people would wash themselves here before entering Dzawadi. They would pray to the creator to take their sickness away.

Vera -Daddy would say, "Tsuxudaxan tsitsakulam numase"

Art - four times.....

Vera - Wash my sickness away Numas, I guess that would be another way of saying creator or ancestor.

Art - Numas is our ancestor from Turnor Island.

Art also talked about the mayaxwala - respect the old people had for everything. Words of thanks were given daily to show respect. His Grandfather's way of showing appreciation for what nature provided, was to give words of thanks. When a big job was completed his Grandfather would yell "hap, hap". This is what a hamat'sa (man possessed by the cannibal spirit Bakbakwala'nuksiwe) yells when in his wild state and looking for food. This was a way his Grandfathers gave thanks to the creator when a job was successfully completed.

.....My grandfather used to say prayers, everything we did in Dzawadi, he prayed. When we finished doing everything in Dzawadi he would hamsagał (yell hap the call the hamatsa makes) hasamala all the way down the river when they're heading to the Skalu, leaving the river, standing in the front of the canoe saying "hap, hap" having his hands up high and saying, "Gilakas'la, Gilakas'la, thank you, thank you."

He also shared how his grandfather would give thanks when gathering traditional food:

.....When we use to go put the halibut gear into the water and then the halibut would come up into the boat. The white part of the halibut, Dada would turn the halibut's head towards Village Island and he thanked the halibut for giving his life so we can continue to, us humans. That's what Dada use to do; he did that when he shot a deer. Right where the deer dropped he use to run around it four times. Twice I saw the old man do that. Thanking the deer for giving his life so we could live. That was the work of the deer, all the animals were human beings.....That's the way Dada was.

His Ada (paternal Grandmother) shared these teachings with him about the Kwakwaka'wakw relationship to animals and their ability to communicate.

.....she use to say about the Gala (grizzly bear) that use to come close to our homes. "We didn't come here to destroy you she would say to the bear, we only came to make t'lina with the oolichans." Old man Jack used to dance. I don't remember how the song went, but he use to dance looking at the bear. And whatever song he sang the bear never came close to the village again. He won't come back till we're finished. I saw the old man do it once; Frances is the one who remembers what the old man did. The black bear is not scared of anything. The old Man Jack use to say that the black bear is really stupid; he's not scared of anything, he use to come close to the village and the people. The grizzly would never hurt us, because we're just one with the grizzly. They are our relatives.

Getting camp ready in Dzawadi

Once the boats had arrived at the flats (where the boats are anchored) then the process of getting all the supplies up to the village begins. One of the most important jobs discussed was getting your pit ready:

The first thing you do you do when you go to Dzawadi, you don't do nothing else, you grab your tools and clear your lap'is (pit/lot) where your going to put your dzaxwan in..... My uncle always told me you prepare the pit, the first thing you do you get down to the clay and the sand. Then you lay the planks for the walls for the lapis.

The old people always took care of the environment what is called conservation today. They taught their young to mayaxala - show respect for all things. They gave words of thanks when

taking things from nature and they made sure that garbage was taken care of. Art talks about his Ada's (paternal grandmother) teachings.

The first thing that Ada (Minnie Dick) used to make us do was to dig a pit for where the garbage is going to go. So we don't go and throw our garbage in the river.“Dzawadi itself will take care of the garbage”, Ada used to say “you didn't cover it up with the sand, you just left it open.we respect the land, we don't own the land the land owns us that's our mother. That's what the old people said and the 'blood is the river.' If you put bad things into it, it would not make the heart of our mother do good things.”

Harriet also talked about the respect shown to the river:

I use to hear my mom talk about how the old people use to really take care of the river. We were never allowed to dump our dish wash into the river. We were not allowed to throw garbage into the river.

Dzaxwān Teachings

The elders were asked if they had seen special ceremonies to mark the arrival of the first oolichan. Jack shared how the old man Punxwidi from New Vancouver would tell the people how things were to be done:

He use to stand with his talking stick in the river and he would give the teachings, say we are not going to put our tagaḷ in till he says it's time. After the oolichans spawn....when he gives the ok. Wexa – go ahead now, then everyone goes in the river and puts their poles in for the Tagaḷ, You have to wait til night time, When the tide is coming in (yaxwala – high tide) then the dzaxwān comes in the early evening and at night.

Art shared how his grandfather looked for the biggest oolichan and what was done with this oolichan:

I was very young, when Dada went searching through the boat load of oolichans, The biggest, a very long oolichan he took out from the pile (he showed with his hands how big) He asked Ada can you please go fry this for me, You're the only one who is going to eat this, I ate it, Dada said “you will never forget Dzawadi now, That oolichan had a name, but I don't remember the name. “You're a supernatural being”....what Dada called Nawalakw – supernatural, sacred you don't even talk about it, you just know. “You'll never forget Dzawadi, you'll always want to come home”, Dada said, you'll never give up on this land, after I ate that oolichan. You're the one that is going to be looking after Dzawadi, Dada use to say to him. It was amazing things that happened when I was a kid with the old people.

Fishing for Dzaxwan

There was a lot of work to do to get ready before going fishing for dzaxwan. In the days before seine nets were used a special conical net called a tagał was used. The net was made by hand with natural fibre. Art talked about his great aunt, who made the tagał for his family:

Dad use to say Anit'a (Andy Beans mother, Ada's sister) used to be the one that use to make the tagał for our family and our tribe..... they used to use the spruce tree, the roots, spruce roots . All winter long, sat there all winter long, wove the tagał net out of spruce root. It's really light. She just held it with her one hand.....(Now) Nobody knows how it was done before, where they locked up the tagał. We just tie up the tagał now (today), nobody knows how to do it the way the old people did it.

This special net was placed below the spawning grounds. Jack explained where the posts were the posts were placed for the tagał and when to check the net:

Some liked to put it where the heavy rip tide - dzala was, and some didn't like to put it there. When it's really big riptide there's lots of oolichan and it doesn't take long to have a full skiff. Two skiffs full we use to have in one night, maybe 2 am or midnight we'd have a full skiff. We used that for a long time, then later on we started using the drag seine.

Once the dzaxwan spawned and they were carried back down the river they floated into the tagał.

It allowed only the dzaxwan that had completed spawning to be caught.

That's why there were lots of oolichans in the old days, because they already spawned before they came down to be caught. That's why the tagał were used, you don't fish oolichans till there 'was'id - spawned.

In the 60's the method of fishing changed from using a tagał to using a small drag seine net at Dzawadi. This method enabled the dzaxwan fisherman to catch a larger amount of dzaxwan in a shorter amount of time. This also meant that not just spawned dzaxwan where being caught. Art explains who introduced this new fishing method and the change that took place:

I guess Mel Stauffer was the first on to bring the kidlam - drag net to Dzawadi. Lots of t'hina coming from the eggs of the oolichans, that's why the old people where anxious to fish, because of all the t'hina (they got) from the oolichans with eggs in them. But the old people (before that time) used the tagał to catch the oolichans after they spawned. We didn't destroy the females with the eggs.

Today the fishermen have gone back to using a tagał – conical net using commercial herring net. Although the shape is similar to the traditional tagał the method of placing it in the river and

the material used is different. Art says that the river is too shallow now to use the drag seine method.

That's why everyone is using (today) the method of taka (method of using the tagal). That's the new way of doing it again. Like we brought back what the old people use to do. It's not the same way the old people use to do it, we use a big metal pole and then you just tie on your net onto a big metal pole. It doesn't work very well the big metal thing.

Harriet talked about how the children even had their own way of getting oolichans:

I use to see the kids use the dip net to get oolichans by the houses. They just enjoyed using their dip nets to catch oolichans.

Everyone agreed that when the wildlife arrives at the inlet then you know the oolichans have arrived. There are thousands of seagulls, hundreds of eagles, seals, sea lions and bears. Roy shared a story from 1985 when they went up a couple of weeks earlier than everyone else to build their house and how they were surprised:

..... I said, let's go take a ride up, we haven't gone up to see what's going on up at the lake, and we came around that corner and there wasn't a seagull in sight and that whole one side was black with oolichans. We went on the other side and there was just as much. I told those guys, drop everything; we're going fishing (laughing).....We went and picked up our net and we made a purse line and the guys couldn't hold the net because there were so much oolichans in there because we were getting dragged down the beach. I told them, let the end go.....We got a half a punt out of it. So we made another set and filled that punt up, went and unloaded it, came back and got another punt load and then we went down to ask Bill (Glendale) and he had no idea that there was oolichans were up there either.

Preparing for making t'lina

Wood needed to be cut, nets needed to be mended, tools needed to be cleaned, samgatsi (tanks for cooking oolichans in) needed to be re-corked. Art shared how you clean the tools your going to use.

.....the galayu (paddle split at the end) and awayu (skimmer) the first thing you start working on when you put the fire on under the samgatsi you put less than ½ a cup of soap in the samgatsi to wash the tools, then you just wipe it off, all the things your going to use when your making the t'lina, Then it gets put away till they start to use it.

Roy said that once the oolichans were in the pit that the rest of the jobs had to be finished:

...in the meantime you're getting things ready, like the fire pit and setting up the tank to put the eulachons in, cutting wood and you know you need quite a bit of wood and a lot more if you've got a lot of eulachons to work on.

I asked my Dad to explain what the tank – samgat'si was made of:

...red cedar and the bottom is galvanized steel or tin....Back in the earlier times I guess they used to be able to get the trees big enough...they could get one chunk, one plank.....they used to be able to cut it so the only joints you'd have is the corners....we were lucky that we found a big enough cedar that we managed to get two eighteen inch planks out of them....the other thing that you should mention about the tank is that there is a hole in the front because when your done and you have the grease you just pull the plug and it goes out into the river.

When some people in Alert Bay talk about making t'lina they say that the oolichans are put in the pit and left to rot. Then the rotten oolichans are cooked and the oil comes out. I found it interesting how the old people explain things. Art said that the old people use to say that the oolichans were not rotting:

The old people said, "it didn't rot it was just cooking in the pit." You wait for so many days for the dzaxwan to cook in the ground.

I have heard another elder use the expression "cooking" during berry picking season. He said that his granny told that after a rain when the sun is shining that the berries are cooking (or becoming ripe) now, I like the way that sounds. My Grandpa Arthur Dick (maternal grandfather) use to say that everyone has their own way of doing things (with in the Kwakwaka'wakw – Kwak'wala speaking people). Our tribe may do a certain dance one way and another tribe within the Kwakwaka'wakw may do it a little different. We learned that we don't go around saying they are doing that wrong, because we were taught the words of our grandpa, "that must be the way they do it". All the elders agreed that the dzaxwan needed to be in pit for 7 to 10 days. Art shared what his aunt told him if the dzaxwan are left to long:

.... my Auntie Rose use to say it will get too ripe and the t'lina will just go into the ground.

He goes to talk about his cousin that left the dzaxwan in the pit longer thinking he would get more

t'lina:

If it gets too ripe (when it's in the pit) the t'lina goes into the land. That happened to Lenard one time, he had it in the pit for two weeks the grease just went into the land. Big pit that he had, he got hardly any grease, he had it in the pit to long.

Ways to prepare Dzaxwan

The Kwakwaka'wakw enjoyed eating dzaxwan a number of ways. A treat for those of us that do not make the annual trip to Dzawadi is frying fresh oolichans. Once the oolichans show up in the river and the pits are full, there is usually one or two boats that may make a trip out to pick up supplies and they will bring out a load of fresh oolichans to share with the community.

Once the pits are full the people in the village knew it was time to start smoking oolichans:

Lit'is - Old man Jack Peters was the last one I saw do this, when all the pits are full.....He would go around and ask do you have enough now, and if everyone had enough then he would shoot (his rifle) in the air and then the ladies would start getting the t'samsayu (sticks for smoking oolies) ready.

Roy gives a description of smoking oolichans and which oolichans are smoked:

...we kind of swish it around in brine and then just put it on sticks....let all the water drip from them first.....the males, you want the bigger ones other then the little ones.

Art shared a story about what happened when a lady put oolichans in the smoke house before the pits were filled:

The old people in the old days, would not allow the oolichans to be smoked till the pits where full. Old Man Jack was trying to tell Lydia not to smoke oolichans yet.....He tried to say that to her, Camano just continued to smoke oolichans, filled his smoke house for two days. When they lit the fire the smoke house just fell apart. Then Lydia was sitting at Art's house and crying. Old Man Jack said, "I told you not to fill the smoke house till all the pits are full." "Now I really know now", Lydia said.

Roy shared how long you smoke the oolichans for

Then again everybody has got their different time tables for their smoking. Some smoke them for a couple of three days and some guys have it well smoked and leave it there for five to six days....

Jack gave the Kwak'wala names for these two types of smoked oolichans:

wa'yutan - is half smoked, dzamdakw - is really dried smoked

They all talked about the importance of making sure the fire in the smoke house was not too hot:

...you can't have it too hot otherwise just the outside would get smoked and the inside would be all soft.

Harriet talked about how her dad would make the little barbeque sticks and her mom would barbeque oolichans:

I use to love watching my dad make the little barbeque sticks (laughs).....I use to just watch my mom when she barbequed the oolichans. She use to tie it onto the special little barbeque sticks. She didn't open up the oolichans, it was still whole when she put it on the sticks. You tied it together with cedar - *danas*, you wet the cedar to make sure the cedar is really wet, when you tie the oolichans onto the sticks. Up to 10 oolichans on a barbeque stick. They used the cedar to tie it so it wouldn't fall off the sticks.

Roy shared how he salted oolichans:

You just brine it, clean it off (clean the slime off) and put it in buckets.....A layer of salt in the bottom and then each layer (of oolichans) you have, there's salt in between them....

He continued to explain how you tell if the salting process worked:

.....after awhile (a few months) if you don't have water in it when you open it; that's after you have left it for a while, you wouldn't eat it.

Rendering the t'lina

Once the *dzaxwan* have been "cooking in the pit" as the old people called it, then it is time to start cooking the first batch of *dzaxwan*. The prior to this the *dzaxwan* are not touched. The seal is broken on the pit once the first shovelload of *dzaxwan* are moved. The interviewee's all agreed that great attention and care needed to take place through the whole process. There were a few things that could affect the taste of the *t'li'na* if each job wasn't taken care of. One being the temperature of the fire under the *samgat'si* (cooking box):

...you can't get your fire too hot either because you burn your tin or you'll have to change it
because it affects the taste of the grease.

Art mentioned that old corking in the corners and joints of the *samgat'si* (cooking box) having an effect on the taste also:

...you have to change the *migulam* – corking on the *samgat'si* so that the damp doesn't change the taste of the *t'li'na* you don't take out the old corking then the taste will go onto the grease. You can smell it even.

They all stated that the blood from the *dzaxwan* also effected the taste of the *t'lina*:

One of the things the old people use to look at was that there were no blood in the pit. So you let the oolichans sit in the boat for a while before you put them in the pit. They keep

bailing out the boat so that the blood doesn't get put in the pit. If the blood goes into the pit then your grease will be just red.

A way in which the crew dealt with the blood in the pit was to use a stick to make little channels to drain the blood away from the dzaxwan.

All four discussed the temperature of the water. They all agreed that the water was not to boil.

Jack shared:

....never boil, you don't boil it, If you boil it the t'hina will turn red. That's no good, you let it simmer and keep check of the fire.

Roy explained how Chap, one of the elders he learned from, had a special way to check the temperature of the water and he goes on to explain the number of shakes:

There is a trick to keeping that temperature because you don't want it to start bubbling up that's when you know it's getting hot. I actually learned from Chap before they started using that big thermometer, to use my finger and I got pretty good at that for a while. Back when the old people used to do it they used to shake, shake..... they use the shakers to shake the meat off the bones. They use to do it about six or seven times and try to get as much grease as they can I guess. We found that we shook maybe three times at the most because the grease was turning a bit red.

Jack describes the process and uses the Kwak'wala words for the equipment used during this process:

Gala'yu, the paddle that's split on the end, you tap g'ala it on the box (samgati'si) and the bones come out....then oil will start showing up and you g'ala (shaking) again. Then the t'hina shows up.

Roy discussed the length of time that the shaking takes place and the time between shakes:

You do actually three shakes. I forgot to mention originally that once the eulachons are in there and you get the right temperature, they float, and once they float you're ready to do your shaking.....Maybe half an hour.... maybe fifteen, twenty minutes in between (shakes)

After the shaking took place the oil began to rise to the top. Harriet shared how her mother used the awayu to skim the oil off the top:

My mom would grab her pail and her awayu (skimmer) to get the t'hina, and all the pails are all ready around the fire, after you transfer the oil from the samgat'si.... you use the screen when you first transfer it to the pails. The first batch that comes out, you leave the t'hina in the buckets over night.

Once the t'lina is skimmed then it is placed into pails to sits overnight. Art shared a story of how his young nephew and son adapted the old method of straining the t'lina, which was taking little squares of cut up sheets and putting it over the funnel to strain the t'lina, once these square of material got clogged up the old ladies would stop straining and go and wash these little pieces of sheets. The boys making it a little easier during the straining process by creating something new:

I have starting teaching our kids, Ernest and Art, they are pretty amazing kids. Watching when they start to axwa – skim. Then the kids starting having a discussion and they started cutting the sheets to. Straining the grease through the sheets, take it and wash it the sheet they would wash the little pieces of sheet. Then they figured out after talking amongst themselves. They rolled the sheet on a dzamsa'yu (stick for smoking oolichans) and then they rolled it over to where they were straining the grease and then they just used cloths pins on the pail and they just rolled it and they didn't have to cut little pieces anymore. It was just one long piece. When they first started doing the things that they do, they just took over me now.

It is the way of the Kwakwaka'wakw to burn food and personal items for the loved ones that have passed on. It is believed that if they come in dreams to you then they are hungry or need a personal item, which is then burned. One time up at Dzawadi we were all sitting around the fire and roasting marshmallows, my niece would eat one and throw one in the fire. My dad came along and asked who's throwing marshmallows in the fire. My nephew answered quickly, "not me". My niece told me that she was giving some to her uncle, who had recently passed away. Art went on to tell how this eagle was watching Ernest and Art Jr. make their job a little easier. The two boys had started doing what they had always done using a whole bunch of small squares of cloth to strain the t'lina. After stopping the straining process to clean their little cloths again, they came up with a new way to keep straining. They ripped the sheet into long lengths and then rolled it on a stick. Then they just clamped the cloth into place and when it started getting clogged they just rolled one side up and let out the clean side.

When they were doing their thing, this big eagle came making screeching sounds, watching them the kids (Art Jr. and Ernest), and Pete came and said that must be Ada (paternal grandmother), cause, Ada had an eagle of her blanket.

And I told Art that's Ada and said you need to burn that (she wants that what you guys created) Ernest said your not going to burn that, and Art just took that sheet and threw it in the fire the eagle was screaming away and when it was all burned, the eagle flew away. Ada wanted it, When Anit'a and Ada use to strain it they had a whole bunch these little sheets and when the t'fina would get clogged up they would have to wash the sheets.. Ada wanted one, what they discovered, they could just keep on working. It's amazing what you can do when you get in touch with your spirit.

As previously mentioned everyone has their own way of doing things. So it is when the t'fina makers bottle their t'fina: Art and Jack strain and bottle their t'fina in Dzawadi. Roy has his own way of doing things:

So everybody has got their own way of doing thingsstrain it...There's mesh on the bucket and then....a cheese cloth. And I dump it three times then you almost didn't have to use the cheesecloth and when you put it in the jugs because we did very little of the actual straining up there. We used to just put it in those five gallon plastic buckets. Seal it and bring it to the shop (in Alert Bay) and then just work on it ...When you needed it.

Learning and teaching

I asked, "How much do you know how our people learn and kind of the ways our people have learned forever?" Art and Roy shared how the old people passed the knowledge on to them.

Art shared how his great aunties taught him as a young boy:

.....they sat me down so I could watch them when they were straining the grease. "Don't touch anything", they said, I had to just sit and watch what they were doing. I wasn't allowed to go run around in Dzawadi.

Roy shared how when he was younger (teenager) that he was there to do the heavy work and did not stay when the old people started cooking the oolichans:

I never used to pay attention to the old people because we use to leave before they started making this (t'fina). All we did was be their labourers, packing eulachons and fishing for them.

It wasn't until he was older that he went up and made t'fina:

I went up with Daisy, Auntie Rose, one year.... It was in the early eighties anyway when I made grease and a couple of years later that's when I decided that I was going to build a house.... So everything I did learn was just from watching and just doing our own thing after a while. I guess we must have done a couple right because over the years people

wanting grease, wanted ours and not from the guys who have been going up there a lot longer than us.

Roy went on to shared how the older men that he fished commercially with “tested” his knowledge:

Your Gramp told me that one year that I fished with him, “go up top, I’m going to go eat” and we were on a set. I said, “What do you mean?” Go hold the wheel and see what fish is going to come. So that was pretty easy. So I closed up and he finally came up top. He said, “Okay, I’ll take it from here after you close up.” We actually did get a few fish even though I didn’t see any going in..... he wanted to kind of test (me) and see what I’d do or how I would react I guess.

The knowledge was passed from the old people to the young people either very deliberately as in Art’s story of his aunties sitting him down and telling him, “you just watch” or indirectly young people were asked or “tested” as Roy said, to see how much they knew and how much they paid attention, as in the previous story and the following one:

I remember old Charlie Dick when we used to go to Bones Bay to make nets and I remember him asking your Gramp, because we were fishing with him and he asked him in Indian (Kwak’wala) if I knew how to work on a net. I’ll show you; you old bugger. I went up after supper and laced together six stretches by myself. He never said another word. The only other word in Indian (Kwak’wala he said) to your Gramp , “does he know how to mend.” Just to show him I got a chunk of net down at the boat and I was cutting it and practicing how to mend, he never said another word after that. I almost put together a whole seine (net) by myself.

Roy gives an example of the teaching being passed on. One year his son (10 years old at the time) and a few of his cousins made their own t’lina with the help of one of the uncles:

I remember when Edgar was up there...when they went and picked up all those dead eulachons behind the village. There was him, Jarret and did their own little pit and nobody to teach or show them anything except for handy Randy. They did something right that one year they ended up with a gallon a piece out of the five container that they brought to their little pit.

Healthy Traditional Food

The old people lived for thousands of years on the natural resources that the creator provided.

They harvested and preserved what they needed. Harriet talks about the different time we live in

now and how in the past we were much healthier because of the good food we ate “our own food”:

I think there is so much illness now, because we eat white man’s food. Especially these fast foods now, that’s what I blame. They don’t eat the good food we use to eat, our own food.... jarred fish and clams, that what she (her mom) canned so that we could bring it to Dzawadi. It’s so different now. I bet the kids don’t know, how we grew up. I think our bodies aren’t strong, because we don’t eat our oolichan grease. We’re not as strong as the old people used to be because we don’t eat our t’lina.

Concern for the future

Each person interviewed shared their concern for the future of making t’lina in Dzawadi. The depletion of the oolichan stocks was a major concern. Some of the factors that were mentioned which have an effect on the small number of returning oolichan were; fish farms in the path of the oolichans travel to the ocean and return home, the affect of logging in the valley, the changing river in Dzawadi and draggers bycatch.

Art share an elders words about this issue:

What Glennie Johnston said is there is no more sacredness of the season, they (the fish farms) are here 365 days of the year, yet the sacredness of the season is no longer there, well the different times of the year when we gather different things. To add on to what Grandpa said, that those people better look after that shit (fish farm waste that sits on the ocean floor underneath the pens), and if we don’t then our country, all the land and water will go haywire. And gone is the respect of the land, the sacredness of the seasons is gone, it’s no more. It’s not there anymore ...the people who are doing the bad things will ruin themselves, don’t stress over it to much it will fix things for us. Don’t stress too much because he’s (creator) is going to come and fix our lands for us.

Don’t let it get to you too much in your day, so you don’t go bother following the people that are fighting it, cause it will fix itself. They are not the creator, because everything they are doing is going to go bad (farm fish and that stuff).

Art goes on to talk about the other resources and areas where he used to gather other

traditional foods:

Now look at our clams now, it’s no good. Auntie Rose just threw out the clams that Arnie dug for her. It was stink, I was just in a place that Gramp called **Oyands** (a little bay right next to Village Island where you could dig for clams when we lived there) and it just smelled like shit just like standing in a shit house, nothing was good where we use to dig clams in our territory. Smells like shit, the Fish Farms are really bad, there is

nothing good. It will never work, because it's not right the ways of following the sun and the moon (seasons). There is no more respect, no one cares anymore. There is so much that has been destroyed... what we used to see, what they used to eat the crabs and the clams. You don't see that anymore, you used to see the clam shells and the crab shells in the woods because the otter and mink use to eat it in the forest. They can't eat that anymore because it's not good. You don't see that anymore.

There is an understanding among the Kwakwaka'wakw that everything is connected. If you destroy or take away one thing from nature it has a lasting effect on the food chain. Art shared what he had witnessed in his traditional home land:

There are no tracks now where the deer use to come down and eat the kelp. They don't come down and eat the kelp. There is nothing good for them to eat any more. That is what I've seen. It's just like murky, mud where we use to have our clam beds. There is no more land that is hard any more. It's all just murky mud.

Roy also shares some of his concerns about the effect draggers (ocean vessels with long lines and deep nets) are likely having on the dwindling oolichan populations:

There're stories today about what the draggers are doing even though they were supposed to have at some point a few years ago behind a beam troll allow the eulachons to escape and I guess that's still not happening because you still hear stories about those guys dumping eulachons out there.

He also expressed concerns about how fish farms and the logging industry are seriously diminishing oolichan habitats and populations:

...Now that we've got these bloody fish farms (in the Broughton Archipeligo), who knows how they're affecting them and I'm pretty darn sure that somehow they're being affected by them because they're still using pit lamps at night to feed the farm fishWell they just attract everything. Those eulachons, they couldn't be very big when they get out this far. They probably just eat them. That's just my suspicion.

Roy continues to talk about the change in the river that he has seen since his first visit to Dzawadi when he was a young man to now.

...the other thing that's happening up at (Dzawadi), all the logging that's happening up there, I remember the first time I went up there it (the Klinaklina River) used to wind its way down from the bridge, but now its almost a straight shot from the bridge down to the village now.

The important stories that were shared about this one traditional food were overwhelming for me. There was so much information, the most important being mayaxala – treating others and things how you want to be treated, caring for the land, river and the dzaxwān as well as the process of rendering the oil and the many ways of preparing and preserving the dzaxwān. Within the last five years you would be considered lucky to have a feed of fresh oolichans if your family does not have a boat coming out of Dzawadi. The teachings need to continue as they have since the creator put our ancestors on this land. Harriet ended her interview with the following words:

The work is so important the t'hina, is so important for our food. We very seldom get it now. I'm so grateful that I can share the little I know.

I am so thankful that these knowledge keepers were willing to share what was shared with them, so that I could share it with our children in the Dzaxwān Curriculum that was developed. It is so important for the traditions to continue, I think of my great grandparents and what they taught my grandparents and parents and how it all needs to continue. Gilakas'la

CHAPTER 4 DZAXWAN CURRICULUM IN USE

This chapter examines the students' experiences during the presentation of the Dzakwan curriculum. The lessons are described in the order in which they were presented to the students. The lessons wove together both Kwakwaka'wakw Traditional Ecological Knowledge and modern Western Science concepts.

Also found in this chapter are quotes from the students' writings in response to the curriculum. There are photos showing students interacting with local resource people and each other during the lessons. Samples of students' drawings are also included illustrating students' learning. All these samples of students' work shows the dzaxwan knowledge that was being gained by the participants.

This chapter is divided into two sections. The first section describes the lessons that took place during instruction, how local knowledgeable resource persons added to the learning that was taking place, and how the students responded to the curriculum. The second section describes the evaluation process, examines the key concepts and process skills that students were learning, and concludes with the researcher's ideas of traditional evaluation process and the inclusion of these methods in this curriculum.

Dzakwan Lessons

April is the time of year that the oolichan return to Dzawadi – Knight Inlet and this year it was also the month that I was welcomed into a Grade 6/7 class to teach 8 lessons over nine days to this class of 7 girls and 11 boys. While I was teaching my lessons one of the girls in the class was up at Dzawadi – Knight Inlet with her parents making t'lina.

Pre Dzaxwan Knowledge

Lesson one was designed as a way for the teacher/researcher to assess the students' prior knowledge and experience of the oolichan – dzaxwan. Students were asked to create a word web of their dzaxwan – oolichan knowledge

It did not take the majority of students long to complete their word web. I was saddened by the lack of oolichan knowledge some students had, as the majority of the students were born and raised in Alert Bay. I thought when we get our feed of oolichans in the spring that everyone is enjoying the same experience. This first lesson showed me that not everyone is lucky to enjoy oolichans. One of the students left his web blank, while 3 of the students wrote the question, *What is a oolichan?* Figure 4 illustrates the students' oolichan knowledge prior to the presentation of the oolichan unit.

What is a oolichan?

You can eat them / edible / its good/ are food.

Little fish / small.

Greasy / t'hina/ oil.

Lives in ocean / water.

You can freeze them.

You can fry them.

Live in rivers.

They only come out sometimes.

Figure 4. Oolichan knowledge prior to Dzaxwan Unit

Introduce Dzaxwan (oolichan) with oral history and Scientific Drawing of Oolichan

Prior to starting lesson two I asked students to arrange their desks in a semi circle so that no one had their back to anyone else. I felt this was the best way to see all the students' faces and it made it easier for them to pay attention. This is the way the desks remained for the rest of the lessons.

Lesson two was divided into two sections. The first examined two Kwakwaka'wakw oral history stories regarding dzaxwan which were; *Eulachon – The Strung Up Fish* told by J.J. Wallas, and *Traditions of the Lig'wilda'xw* told by Chief Billy Assu. Prior to handing out the stories I discussed with the students the term “oral history” and “myth” or “legends.” Oral history refers to the stories which have taken place in a First Nations history which have been told since the beginning of time due to having no written language. There was a time in this oral history when our ancestors had supernatural powers. I asked students if they knew the meaning of “supernatural”. One Student said, “like superman”. I gave the example of having the ability to change from human form to being able to fly or have super strength. I went on to ask the students what they thought of when they heard the words “myth” or “legend.” One student answered, “a story from long ago”. I asked “do they think of a myth or legend as being a fact or just a story?” The majority of the class thought of myths and legends as stories and not part of history. I concluded this discussion with the idea that these oral histories have been handed down for generations and are a part of Kwakwaka'wakw history. Thus, our oral stories are our truth, and are not to be considered myths or legends

The class was divided into two groups. Each group was instructed to read the stories and be prepared to share their story with the other group when we came back together. When all the students came back together and the students were sharing the story which Chief Billy Assu

shared, which told of the woman with the wings on her back who originated from Dzawadi, some students giggled. I asked what was funny? One student replied, “How could a lady have wings on her back?” “Good question”, I said, and reminded them of our talk about the ‘supernatural’ ability of some of our ancestors. This woman with wings must have had some kind of supernatural ability if she had these wings.

I asked students to think of a time when our people lived in traditional bighouses and used canoes to get around. It was a different time then how we live now. Our ancestors lived in their traditional areas for hundreds and thousands of years before the Europeans arrived. Their day to day life was full of science; catching and preserving



Figure 5. Barbeque oolichans and salmon



Figure 6 Wá'yut'an – half smoked dzaxwān after being smoked for 2 to 3 days. (1996)

food, (Figure 5) cooking (Figure 6), knowing how to build bighouses and canoes without the tools and machinery that we use today to build the same things. They also cared for and respected all of creation; the plants, animals, rivers and forest. I went on to explain that today this knowledge is called Traditional Ecological Knowledge and Wisdom.

Now that the students were introduced to the dzaxwān – oolichan through Kwakwaka'wakw oral history, the students were asked to create a scientific drawing of a oolichan. Photographs of oolichans were passed around the class then posted on the

board. Figure 4 is one of the photographs of an oolichan for students to use as an example of how an oolichan looks.



Figure 7. Long, slender adult oolichan ~15-20cm in length and weigh about 40-60grams
Dzaxwān is the Kwakwa'la name for Oolichan (*Thaleichthys pacificus*).

This was especially important since some of the students didn't know what an oolichan was. Each student received the Fact Sheet – “Physical Description of the Oolichan.” Students were asked to give the scientific name, exact measurement, draw the oolichan using clean lines and label four body parts. An example of a scientific drawing of a hermit crab was also posted on the board to give students an example of a scientific drawing.

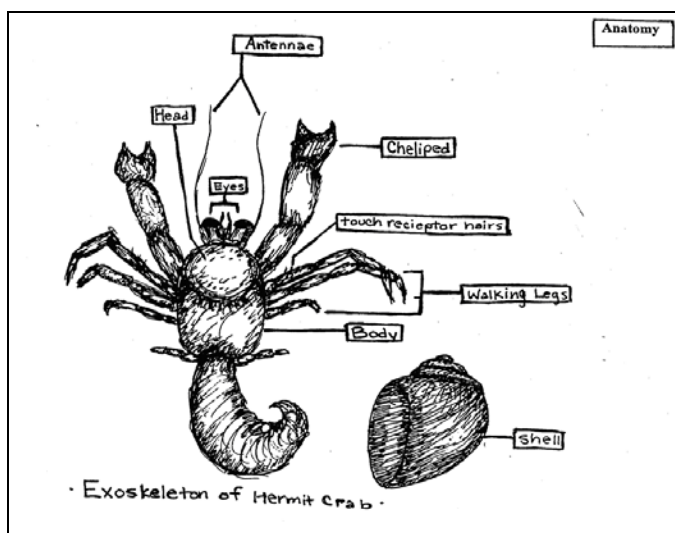


Figure 8. Example of a scientific drawing. <http://biologyweb.org/hermit.htm>

Some students got right to work while others seemed to have difficulty getting started and completing their drawings.

Life Cycle of Oolichan

During each lesson students were given information in the form of fact sheets and new word sheets. In the life cycle unit students were introduced to many new scientific words. They found it fascinating that when oolichans are moving from the salt water back into the fresh water they reabsorb minerals from their teeth and scales to help in the reproduction process. Figure 9 is a sample of one of the worksheets created for the unit.


Lesson 3 Life Cycle of Oolichan	Dzaxwan Unit	Worksheet 1 Oolichan eggs
Oolichan eggs are small <1.0 mm diameter and mildly adhesive. These fish of the Smelt family lay eggs in small gravel.		
		
Look closely, you can see the eggs and the eyes in the eggs. How many oolichan eggs can you find? _____		
(photo taken from the following web site http://farm1.static.flickr.com/13/18256215_d820cdb453.jpg?v=0)		

Figure 9. Worksheet 1 Oolichan eggs

Some of the students found the oolichan eggs among the gravel easily, while others had a bit of trouble telling the difference between the gravel and eggs. Once their friends pointed one or

two eggs out they found it easy to make out what they were looking for. Figure 10 is of one of the photographs used to illustrate the five stages of an oolichan's life from juvenile to spawning. One student questioned "*How could an oolichan reabsorb it's teeth?*" Students were amazed at the amount of eggs that an oolichan lays. One of the comments made was "*How could a fish that small hold 25,000 eggs?*"?



Figure 10. Five sizes of oolichan shown above from juvenile to spawning.
(photo taken from following web site

Students recognized the similarities between the life cycle of salmon and oolichans, that they both began life in fresh water, migrated to salt water and then return to fresh water and to the same stream and location to spawn, and begin the cycle again. Students used Figure 7 to help them fill in their Oolichan life cycle chart.

Life cycle stage	Needs		Threats	
	Habitat	Food	Predators	Others
Egg <ul style="list-style-type: none"> • Head and body begin to form • Organ formation begins • Eyes become visible 	<ul style="list-style-type: none"> • Oxygenated water • Temperature from 3° to 10° C • Steady water flow 	<ul style="list-style-type: none"> • Yolk of egg 		
Larval <ul style="list-style-type: none"> • Larva breaks through egg membrane • Oxygen absorbed through gills • Eyes become visible 	<ul style="list-style-type: none"> • Larva flushed to sea rapidly sometimes within minutes. • 	<ul style="list-style-type: none"> • Phytoplankton and Zooplankton 	<ul style="list-style-type: none"> • 	
Juvenile <ul style="list-style-type: none"> • Develop fish- like characteristics • 3-10 cm in length 	<ul style="list-style-type: none"> • Juveniles live in the sea for 2 – 5 years before spawning in 	<ul style="list-style-type: none"> • Phytoplankton and zooplankton • krill 	<ul style="list-style-type: none"> • Chinook salmon 	<ul style="list-style-type: none"> • Draggers
Pre-spawner <ul style="list-style-type: none"> • they make physiological changes that allow them to survive in fresh water • somatic tissues are sacrificed for the benefit of sex organs and reabsorb minerals from scales and teeth 	<ul style="list-style-type: none"> • separate from non-mating population and migrate to spawning rivers 	<ul style="list-style-type: none"> • Phytoplankton and zooplankton • krill 	<ul style="list-style-type: none"> • Chinook salmon • Seals • Sealions • Seagulls • Eagles • bears 	<ul style="list-style-type: none"> • Draggers
Spawner Several hours to a day to spawn	<ul style="list-style-type: none"> • spawning river 	<ul style="list-style-type: none"> • no longer feeding 	<ul style="list-style-type: none"> • Sturgeon feed on these fish • Seals • Sealions • Seagulls • Eagles • Humans • bears 	
Post-Spawner <ul style="list-style-type: none"> • adults reach length between 15-20 cm, weigh between 40-60 grams. 	<ul style="list-style-type: none"> • spawning river 	<ul style="list-style-type: none"> • no longer feeding 	<ul style="list-style-type: none"> • Sturgeon feed on these fish • Seals • Sealions • Seagulls • Eagles • Humans • bears 	

Figure 11. Table of Oolichan life cycle needs and threats

Oolichan Food Web

This lesson began with a discussion of predator-prey relationships and food chains. The students understood the concept of food chains or webs by the examples they gave during the discussion. One of the girls gave the following example, “*We eat salmon and seals eat salmon..... sometimes we eat seals and whales eat salmon.*”

When the topic of fish farms came up during this discussion, one of the students pointed out the issue of the extremely large amount of sea lice that can be found around fish farms and how that has an effect on the small fry that pass by the fish farms. Another student questioned “*How does it affect the salmon fry*”, I asked does anyone know the answer to this, no one responded. I explained that sea lice has always been a part of the ocean, but because of the large amounts of fish in the fish farm pens there are more sea lice in and around these farms and these sea lice attach themselves to the little fry that are making their way out to the ocean. If that little fry has too many of the sea lice attached to it, how can it make its way out to the ocean?

The role that an oolichan plays as a predator and as prey was discussed. There were photographs that were posted on the board of the different animals that oolichans (as predators) live off, and of the animals that oolichans live off (the prey). Two examples of oolichan food chains were presented to the class; a food web of oolichans in fresh water and a food web of oolichans in salt water (figure 8 and 9).

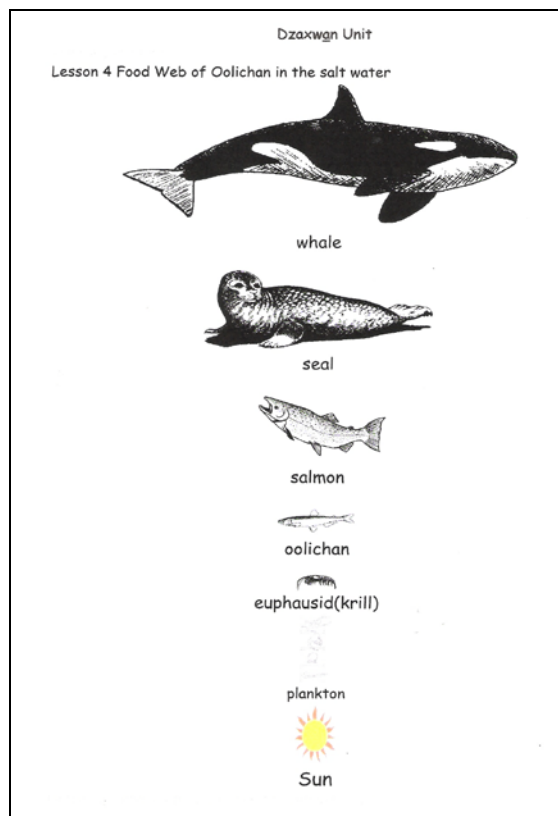


Figure 12. Food web of oolichan in salt water.

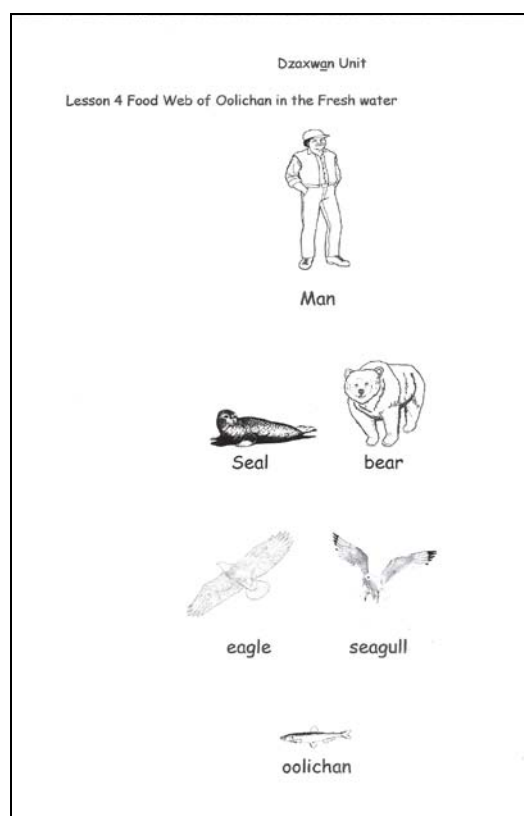


Figure 13. Food web oolichan in fresh water.

The students were asked if they knew what plankton was. No one knew the answer to this question. A brief discussion took place explaining that plankton were tiny plants and animals that were in every drop of water in the ocean and that it can't be seen with the naked eye. Most plankton can only be seen with a microscope. One of the students commented "*I'm never going in the water again if I get covered with invisible critters*". The classroom teacher explained that they have always been in the salt water and they don't harm us in anyway.

The food chain discussion was a good introduction to the food chain game. The class was divided into four teams and each team was assigned one of the members of the food chain; oolichan, salmon, seal and man. Popcorn was sprinkled on the playing area and was the plankton. All students were given plastic bags that were marked with masking tape which was their stomach. The oolichans were allowed on the playing area first and had one minute to fill

their stomachs with plankton (popcorn). When the minute was up the other animals were allowed on the playing area. As players were tagged by a different animal in the chain they had to give up their stomachs and leave the playing area. The class played the game twice before we went back to class and discussed what happened during the game. During the class discussion the topic of the environment came up. One of the students mentioned that he saw this on the internet “*Out in the middle of the ocean there is an island of garbage.*” I’d never heard of this before but asked them, “If there is such an island out there, how do you think this effects all the life in the ocean?” One of the students said “*That’s disgusting*”. I had to agree with him. We talked about how we mistreat the rivers, and oceans, and this has an effect on the environment around us even if it we think it is a small. One student’s response was “*That can’t be good for the animals that live there.*”



Figure 14. Students during class discussion.

It was good to see the students moving around outdoors and having fun playing the food chain game. Lively discussions followed the game about habitat and human’s lack of respect for the environment and how this all effects the food chain and of course the oolichan. Some other issues that were discussed included; oil tankers and oil spills, and sea lice around Atlantic salmon fish farms. The students had a good discussion on how these facts affect the oolichan and all the other animals that live in the ocean. One of the great comments by a student was, “*We really*

need to watch what we drop into the water, don't we?" I thought this was a good way to end this lesson due to the fact that we would be exploring fishing methods and the traditional beliefs held by Kwakwaka'wakw on the 'mayaxala', or respect shown all things.

Oolichan Fishing and Creation of the Lap'is (oolichan pit)

The lesson started with a discussion about the Kwak'wala word 'Mayaxa'la'. Many of the students nodded their heads when asked if they knew that this word meant. One student stated "*Doesn't it mean respect?*" This is one of the most important Kwakwaka'wakw teachings, treating others, nature, plants and animals and all things the way you would like to be treated, non Kwakwaka'wakw use the word respect. I felt it was important to begin this lesson with the giving of thanks and the way in which the ancestors of the Kwakwaka'wakw were always giving words of thanks to the resources prior to taking what was needed. I asked students, "When do people usually pray?" "*In church*", was the answer. I shared with them Arthur Dick's story of how his Grandfather always gave words of thanks or prayed when he shot a deer or was pulling up halibut. It was a part of everyday life, not something that was just done on one special day of the week. The Kwakwaka'wakw way was to show respect for the things in nature that helped to keep the ancestors alive.

Traditionally the old people that travelled to Dzawadi would make the stop to bath in the water of Twin Falls (figure 12), saying the following words as they washed themselves,

"Dzuxudaxan t'sit'sak'ulam numase" which translates to *Wash my sickness away.*

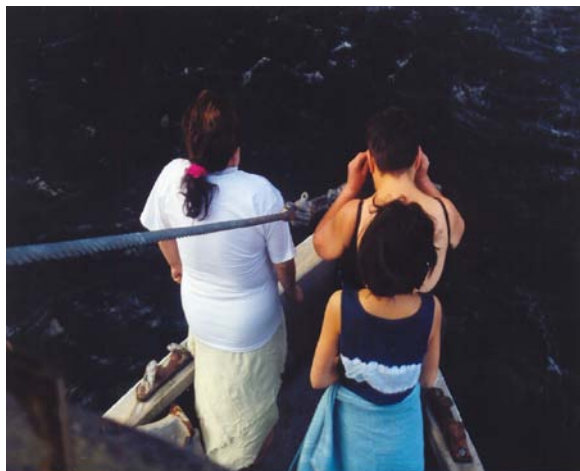


Figure 15. Bathing at Twin Falls (1997) .

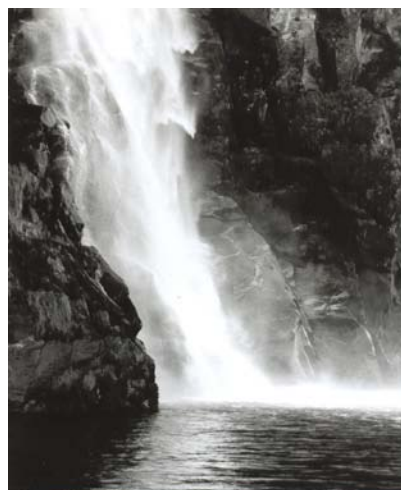


Figure 16. Twin falls.

Today there are still some family's that will stop at Twin falls to bath under the water repeating the words of their grandfather (Figure 15). These important words as well as the words of thanks, or prayers as they were called by Anthropologist Franz Boas, were an important part of the mayaxa'la shown by the old people. Some of these teachings are slowly being lost. One of the examples shared in one of the Fact Sheets was the prayer of a man hauling the first dip net full of oolichan recorded by Boas.

During this lesson arrangements were made so that a t'hina maker could visit our class and share his wealth of traditional knowledge. I reminded students to mayaxala (be respectful of) our visitor and that their behavior not only reflected on themselves but our school and their family.

Roy Cranmer visited our class this day to talk about fishing and the process of making T'hina. During his talk he explained how the t'hina making process worked with the aid of a miniature samgat'si (cooking box), skimmers, shakers and tagał (conical net) which he loaned to me to use with the class. Figure 13 is a photograph of the miniature tagał that was used to show the students the way it worked. The three black arrows indicate the posts which prior to the 1960

would have been pounded into the river bed to hold the net in place. He told students that the DVD – *T’lina - the Rendering of Wealth* (1999) showed the process of making t’lina and asked if we could watch it and then if there were any questions he could answer them. During the DVD, he requested that the DVD be stopped so that he could explain certain things. When the men were drag seining we stopped the DVD and he went on to explain that this is how they fished in Dzawadi in 1997, 11 years ago and that today they have gone back to using a special net called a tagaļ. Figure 14 shows the tagaļ that was used in Dzawadi in 2002 and continues to be the method used today. The method of anchoring the net in place is one of the many differences between the modern tagaļ and the one used before the introduction of the drag seine method of fishing.

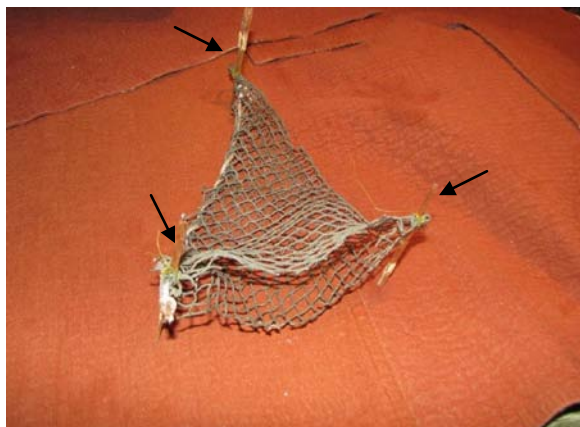


Figure 17 Miniature tagaļ (conical net)



Figure 18 Tagaļ used in Dzawadi 2002

Roy explained the reason for changing fishing methods was due to the changes in the river. The river has changed since his first visit in 1961, it is very shallow in some places. One of the students asked “*How is the river changing?, What do you mean changing?*” Roy explained that when it rains in Knights (Inlet), and because of all the trees that have been taken out of the valley due to logging, that the river rises almost immediately. He went on to say that there are a lot of log jams in the river that never use to be there. Stevie Beans discussed the same

subject, how the rain affects the river in the DVD. Roy went on to explain that the size of the glacier at the top of the river has changed in size, it is getting smaller. He told them there are many things that affect the way the river runs. Roy shared many things with the students including; how to make a pit, fishing methods, putting the oolichans in the pit and then moving them to the cooking box (samgat'si), cooking the oolichans and environmental concerns.

The second part of this lesson was divided into two sections. The first section was a discussion about building a lap'is (pit). Students reviewed the notes they made from Roy Cranmer's visit which can be found on figure 15. As students read out their information, notes were made on the board about the tools needed and size we should make our miniature pit.

Roy Cranmer's Visit	
Oolichan Pits	
<ul style="list-style-type: none">- let oolies get soft in pit- pit has seal (once oolichans are put into it)- pit holds 3 punt loads @ 6 tons- clean area for pit, clear grass and bushes away	
Making a pit	
<ul style="list-style-type: none">- wood 6" tall and 2' x 3'- clean off grass- shovel,- clippers,- nails,- hammer	

Figure 19. Students' notes on the oolichan pit.

Photographs of pits in Dzawadi were posted on the board and I made a comparison between the pit in Figure 16 and Figure 17. The information that Roy gave during his visit was that he harvested about 6 tons of oolichans (figure 17) to fill his pit in the 1990's. Figure 16 shows one particularly interesting pit. The planks in Figure 16 must have been at least 10 to 12 inches (25 to 30 cm.) wide, which meant the pit was between 20 to 24 inches (50 to 60 cm.) deep.



Figure 20. Archival photo of an extremely high pit.



Figure 21. 1998 pit, oolichans reach just below mid way point of plank

I said to the students, can you imagine the amount of t'fina they rendered from that one pit? The photo from the 1998 pit (figure 21) has about 6 tons, how many tons do you think are in the old pit? (figure 16) I thought the following was a great comment by one of the boys which is something I didn't even think of, "*How do you know the pit worked, if it was so deep, maybe it didn't work?*" I answered, "your right". I had no information about that archival photo. I thought that was a great point. I also thought that his observation skills were right on. From seeing the examples of pits in the DVD and from the information Roy shared he came up with the idea that maybe this one just might not have produced the amazing amounts that I had thought it might.

Since the oolichan fishing camps are located some distance away from schools (8 hour seine boat ride) and it can be inconvenient to house numbers of students at the camps it was necessary to teach about the harvest and rendering of the critically important oolichan through simulations. In this simulation rocks represent oolichan to explain the importance of filling the pit and after the 8 – 9 days loading the oolichans into the cooking box (beginning from the first load put it). Traditionally, oolichan oil was separated from the fish by heating (attention being paid to the fire, so it did not get too hot) the decomposing oolichan bodies in a samgat'si (large wooden cooking box with a metal bottom) using red-hot rocks. Perhaps in future years frozen oolichans could be brought to the classroom and cooked to make the simulation even more authentic in the school setting.

Notes were made on the board which included equipment and materials needed and the dimensions of a miniature pit. After this discussion took place three students were chosen based on participation during class discussions and behavior in class, to help create a miniature lap'is - pit using the dimensions discussed in class with the help of Anthony Hunt a local knowledgeable t'ina making crew member.

Building an Oolichan Pit



Figure 22. Students clearing the pit area.



Figure 23. Eric and Jerrit Isaac and Edgar Cranmer clearing the area for their pit. (Dzawadi, 1997)

The boys were asked what they remember from Roy Cranmer's talk the previous day about digging a pit. One of the boys said, *"We need to clear all the grass away, get right down to the dirt."* They got to work, clearing the area (Figure 22). Figure 19 shows the young boys clearing their pit in Dzawadi (Knight Inlet) in 1997. "What is next?" Anthony asked. *"Don't we need to put the walls up?"* one of the boys questioned.



Figure 24. Lap'is complete.



Figure 25. Lap'is in Dzawadi.

Next the boys hammered the stakes in the ground to hold the walls in place. Figure 24 shows the lap'is once the wooden walls have been added. Figure 25 shows the completed lap'is in Dzawadi. Once the lap'is was complete the rest of the class went out to see the completed pit. Anthony showed the students the type of tub that was used to move the oolichans from the punt to the pit. He used the sticks to show how the (Figure 26) how the strong wooden handles were added to the tub for the job of moving tons of oolichans. Figure 23 shows two students posing with the tub used to move oolichans from the punt to the pit in Dzawadi. Next Anthony explained to the students that the way you fill the pit is very important. He told them that it is important to remember where you put your first load of oolichans. I asked "Does anyone know why you have to remember where the first batch of oolichans goes?" One of the boys said, *"That is where you would start from when you start putting the oolichans in the cooking box."* In my

mind I was thinking, o.k. they were listening yesterday when Roy was talking and they were paying attention to the DVD.



Figure 26. Anthony showing students



Figure 27. Art Dick Sr. and Jr. carrying a tub of oolichans tub used to move oolichans (Dzawadi, 1997).



Figure 28. Students watch as rocks (oolichans) are loaded into the pit. (simulation)



Figure 29. Juicy (Richard Smith Sr.) dumping a tub of oolichans into the pit. (Dzawadi, 1997)

Anthony went on to demonstrate how the oolichans (for our simulation we used rocks) are loaded into the lap'is-pit (Figure 28). Figure 29 shows Richard Smith Sr. unloading oolichans into his pit in 1997. He used the same kind of metal tub used up Dzawadi and loaded it half full with small rocks. This was to give the students an idea of how heavy the tub was. I reminded students that one punt load was about two tons. That two tons of oolichans has to be moved from the punt to the pit all by hand, there are no

machines that can do this up the inlet, just two guys using these tubs, one tub at a time, very labor intensive. This is the same method used to move the oolichans from the pit to the samgat'si (cooking box), one tub at a time. Figure 26 shows students simulated lap'is and figure 27 shows a lap'is in Dzawadi loaded with dzawan (oolichans).



Figure 30. Students completed lap'is-(pit) with (simulated oolichans). (1998)



Figure 31. Barb Cranmer sitting in front of loaded pit. rocks

While the boys were creating the miniature pit outside with Anthony the remaining students were given the fact sheet *Methods of Fishing for Oolichans* and class discussed the evolution of fishing methods. They had already heard Roy talk about the tagał, dip net and seine net the day before and had seen examples of the crew drag seining and using the dip net in DVD. The discussion of these fishing methods focused on the two categories; passive and aggressive.

Making T'łina and T'łinagi'la

The last two lessons focused on the making of t'łina and the ceremony of giving it away within Kwakwaka'wakw culture. The lesson on making t'łina



Figure 32. Miniature samgat'si (cooking box) and tools.



Figure 33. Students checking out the miniature cooking box.

examined the steps that go into rendering the oil from the oolichan. Facts sheets A - Making T'lina illustrated the step by step process of rendering the oil. This was a review from Roy Cranmer's talk the day before. Figure 32 shows the miniature samgat'si – cooking box and tools which Roy used to explain the cooking process. He shared with the students that the water in the samgat'si had to reach just the right temperature, before the oolichans could be added. He stressed that the water was never to boil. He went on to explain that the two paddle looking tools which are used to pour the oolichans over as they are added to the heated water in the samgat'si. The two long sticks with the slits at the end are shakers. After the oolichans begin to float then these two tools are used to scoop the oolichans out of the water and tap the side of the samgat'si with the tool and shake the oolichan meat from the bones. Finally the little oval shaped scoops or awa'yu – skimmers are used to skim off the oil that floats to the top. Some of these skimmers are carved in the shape of a like large clam shell. They range in size. As the

area of oil to skim becomes smaller so does the awa'yu used to skim. (Figure 34).



Figure 34. Skimming the t'lina (Dzawadi).

Students read through the fact sheet and took a observed the photographs. I explained to the students that during my dzaxwān research one of the people I interviewed (Jack Nolie) gave me his awa'yu – skimmer, because he wanted the knowledge to continue to



Figure 35. Awa'yu – skimmer & t'lina.



Figure 36. Back of awa'yu – skimmer showing an eagle wing.

be passed on. Figure 31 and 32 show the awa'yu that I received. I shared it with the class and explained that it was used to skim the oolichan oil from the top of the samgat'si. This particular awa'yu has an eagle wing on the back side. I asked students, “Why do you think the carver of that awa'yu carved an eagle design on the tool?” No one answered. I asked, “How are these two animals, the eagle and oolichan connected. Think back to the food chain discussions.” Finally

one of the students recalled, “*Well the eagles eat the oolichans when they come back to the river*”. I added that in Dzawadi when the oolichans are heading up the river to spawn hundreds of eagles can be seen in the branches of the trees. Another student added “*Maybe it was a crest of the owner.*”

Students were asked to list in order the steps of the process. They gave examples from what they remembered from the DVD we had seen two days earlier and some referred to the descriptions that Roy and Anthony had shared. Students commented on all the work that went into making t’lina.



Figure 37. Students looking on as the teacher shows a gallon of t’lina.



Figure 38. A gallon jar of t’lina.

T’lina Uses - Medicine

I showed the students a gallon of t’lina (figure 33). I shared with students that I heard older members of my family call it “Our gold, it is so valuable.” I asked students how do we use it. One of the girls said, “*We dip our smoked fish in it*”. I asked, “How else do we use it”. I told them that it is also used as a medicine. I remember seeing my great grandfather Charlie Dick take a couple of spoonfuls of t’lina and swallow it down without any food. We always heard that

it kept us healthy, kept the sickness away. It was also heated and rubbed onto the chest of someone suffering from a cold or congested chest. It cleared up this condition.

T'lina Uses - T'linagila & Grease Trails

During the final lesson we discussed two ways in which the Kwakwaka'wakw used the t'lina in ceremony and in trade. Before we discussed t'linagila, the Kwakwaka'wakw ceremony of giving away t'lina at a potlatch, I asked students, "What is a potlatch?" Figure 39 lists the students answers.

A potlatch is:

When a chief will show his familie's dances.

When Indian names are given.

When someone dies, their family as a memorial potlatch.

When dances are given to younger family members.

It means to give.

Figure 39. Students' definition of a potlatch.

I was impressed with the students' answers. I know some of them had participated in their own families potlatches. I added to the information that was given by the students. Prior to the Europeans coming in our territory our people had no written system to record things. The potlatch was a way for a chief to show his ancestral links to the songs, dances, names and masks that he owned. Host chiefs would invite tribes to witness as he opened his box of treasures, showing dances, songs, handing down names and privileges. These potlatches took place as memorials for loved ones who had passed on, to mark marriages, pass on names, dances, songs and even rights to hunting or trapping grounds. The witnesses were paid by the host chief and this is how the history was passed on. The gifts given at these potlatches have changed over the

years. Prior to contact a chief's family would save for years; animal furs, woven blankets, baskets, hats to give at a potlatch. Today the majority of items given away at a potlatch are purchased from department stores; towels, laundry baskets, kitchen ware and blankets. The one thing that has remained the same over the years is the giving away of t'lina. There are some families that continue to host potlatches where this valued gift is given. During a regular potlatch the gifts are given after the host has shown all his families treasures (dances). During a grease potlatch the t'lina is usually given away after the mourning songs are sung and the copper talk takes place, before the family dances are shown.

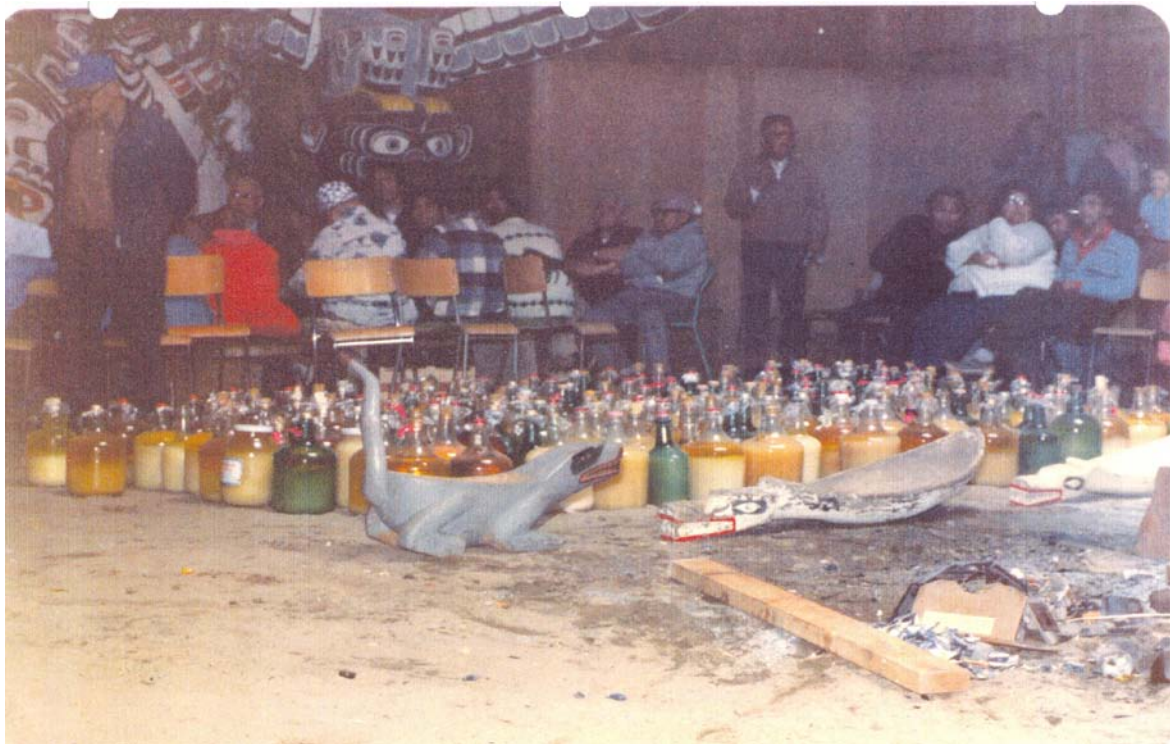


Figure 40. T'lina given away at Arthur Dick Sr.'s Grease potlatch a memorial for his late aunt Lucy Brown. 1974.

Before distributing gifts to the guests whether it is dry goods which is given at the end of a potlatch or t'lina, the chief's family lays all the gifts out on the floor of the bighouse. During the t'linagila special feast spoons and dishes are brought out that may be carved the crests that

the chief has a right to use. In front of the gallons of t'lina in Figure 40 are a wolf feast dish and two wolf feast spoons which belong to Arthur Dick's family. The traditions remain strong among the families that continue to potlatch. I asked students to notice these same ceremonial objects carried by the matriarchs of Art Dick Jr.'s family in 1999 at his father's memorial. These objects are still being used twenty five years later.



Figure 41. Female relatives dancing with the feast dish and spoon at memorial grease potlatch for Arthur Dick Sr in 1999.



Figure 42. Arthur Dick's sister Daisy Joseph, daughter Vera Newman and aunts, Ethel Alfred, Stella Sumners and cousin Christine Taylor holding Grease spoons and wolf feast dish at a Grease feast he hosted 1974.

In the DVD *T'lina – The Rendering of Wealth* Art Dick Sr. and Jr. refer to this ceremony as the highest (most prestige's) potlatch a chief can give. I asked the class, "Have you ever been to a potlatch when a chief has giving away t'lina?" One of the young girls said, "*My uncle gave away grease at our families memorial potlatch for our Grandpa and Ada*". I asked, "How many students have seen such a potlatch?" More than half the class said they have attended such a potlatch. I asked students that had been to a grease potlatch to pair up with a student that had not been and tell what they remembered. The other student was asked share what was discussed to everyone else. Figure 43 is a list of responses students shared.

What happens at a Grease potlatch?

Feast songs were sung.

Speeches are given by chiefs.

Some times t'lina is poured onto the fire.

Sometimes 20 lb bags of flour is also given out.

Boxes or baskets of traditional food are also included; home made jam, canned fish, seaweed, jarred clams, kawas – dried fish.

Figure 43. List of students memories of T'linagila (grease potlatch).

I explained to the class that the potlatch shows our history. It shows how our family connects to the ancestors from our origin stories that go back to the time of the supernatural beings. I asked students to think back to the origin stories that talk about the oolichan, now imagine how long Kwakwaka'wakw people have been hosting grease potlatches. *“It's been a long time,”* one of the students responded.

T'lina and Grease trails

The final discussion in class was about the trade routes called “grease trails” that our people used to travel when trading with neighboring tribes. In his book “Following the Path of our Ancestors”, William Wasden tells of the 'Namgis First Nation ancestor U'ma_lame' who founded the Grease trail connecting the 'Namgis with the tribes on the west coast of Vancouver Island. For almost one hundred years that particular trail was not in use but in 1999 four men from our village traveled over the ancient trail carrying t'lina to share with west coast relatives at the canoe gathering in Ahousaht. During this journey on the grease trail a song was composed by William Wasden to commemorate the reopening and use of this ancient trail. Many of the students knew the song but did not know what it was about. I told them that in Ahousaht when

those four men and their crew of pullers (people that paddle in the canoe) landed they carried that t'lina off their canoe to give to the Ahousaht chiefs. That is the first time that song was sung and danced.

During our first class I told the students that at the end of my eight lessons we would host a luncheon and invite our parents to come and see what we had learned. I asked for a couple of student volunteers to create a drawing that we could use as a invitation to our luncheon.

The students helped to prepare food and set up the gym for this luncheon. We were lucky enough to have our lunch when a boat had just come out from Knights Inlet and they shared some fresh oolichans with us. The parents and students were able to have a feed of fresh fried oolichans. Smoked oolichans was also on the menu along with yusa-fish soup, baked fish, fried seaweed and of course t'lina. Students were reminded that they were the hosts and that in Kwakwaka'wakw way the host always serves his guest first. It was a wonderful way to end off the two weeks Gwayilelas curriculum unit, feasting with our traditional food.

Evaluation

This science unit was a combination of Kwakwaka'wakw Traditional Ecological Knowledge and Wisdom and Western Modern Science concepts. It is a strong held belief that for our First Nations children to be successful they need to know where they come from; traditions and history. One of the ways of showing students Kwakwaka'wakw traditional science was by bringing community members into the classroom to share their knowledge. Traditionally this is how the knowledge was passed on, older community members sharing their knowledge. The method of evaluation for this unit was both traditional and modern. These included the following;

- Students read and then shared two origin stories of the oolichan.
- Students created scientific drawings of an oolichan; labelling four body parts, giving the scientific name, kwak'waka name and measurement.

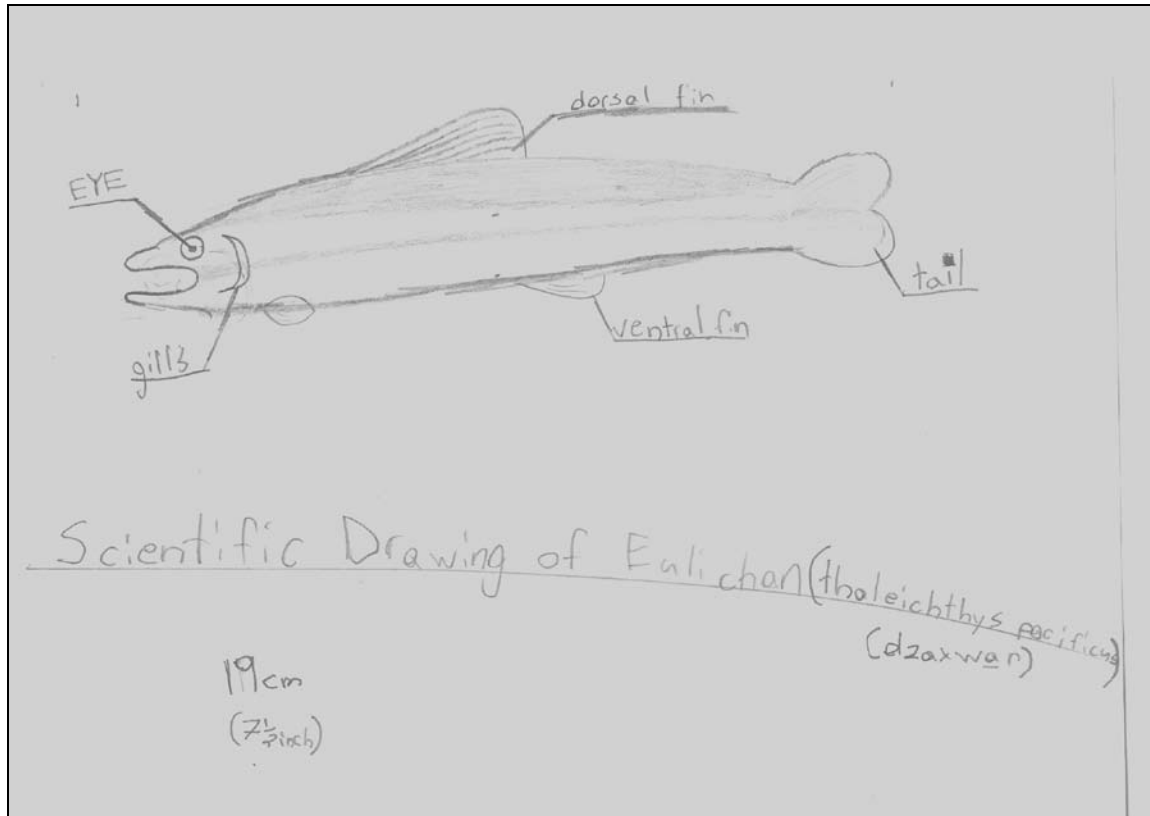


Figure 44. Student's example of a completed scientific drawing.

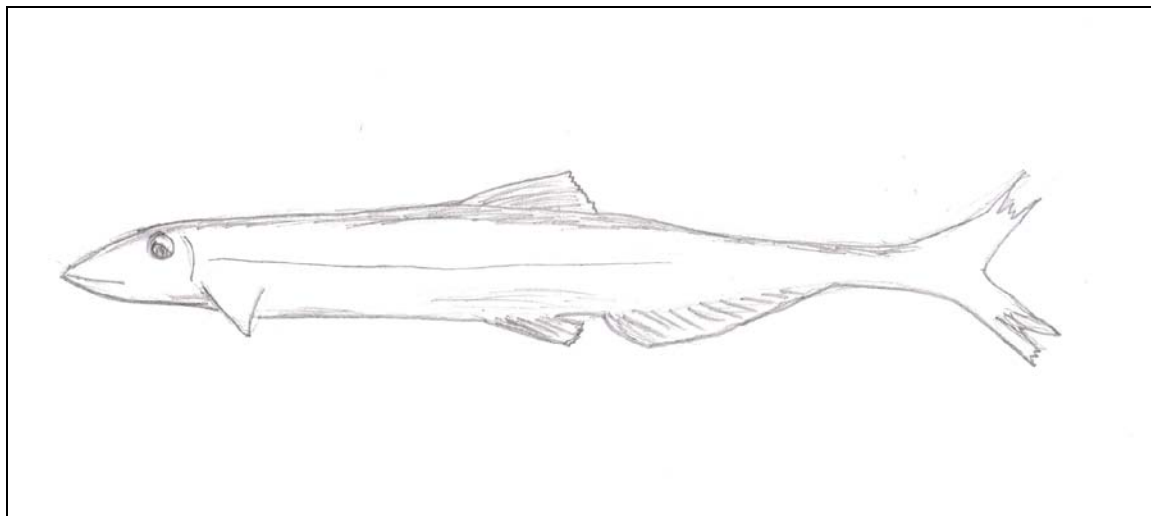


Figure 45. Student's example of a completed scientific drawing.

- Students participated in the food chain game, and identified predator-prey relationships within a food web.
- Students created a list of the various components of a potlatch.
- Students listed the gifts that were given at a potlatch prior to contact and today.
- Students listed and ordered into a proper sequence what takes place during a grease potlatch.
- Students created a chart of the life cycle of the oolichan; illustrating the measurement of the fish at each stage of their life, length of time in each stage and name of each stage.
- Students answered a mini quiz with review questions from the first four lessons that covered; oral history, different stages of the life cycle, food webs, predator-prey relationships, environmental concerns, and human affects on the oolichan population.

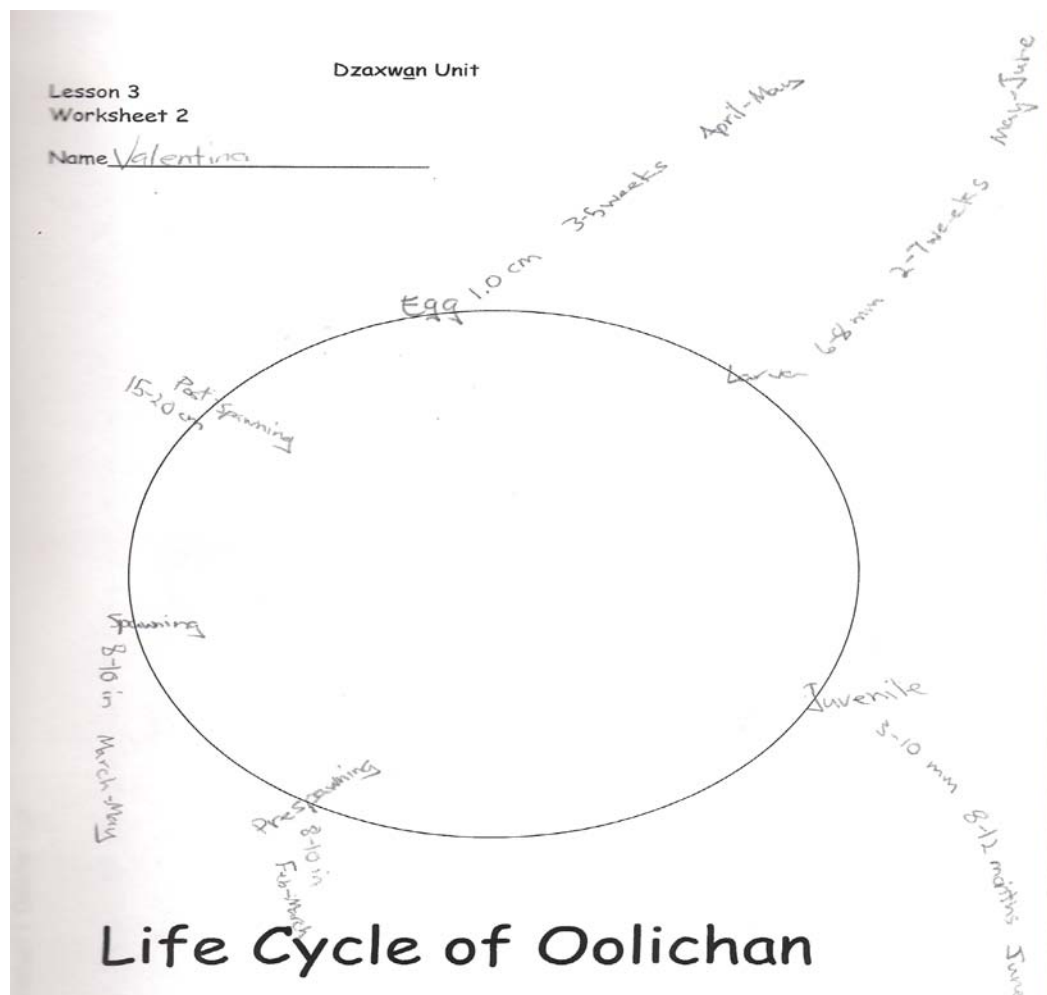


Figure 46. Student's example of the life cycle of the oolichan.

- Students studied, compared and described the many methods of catching oolichans; tagak-conical trap, drag seine and dip-net.
- Students studied and described the process of making t'fina.
- Created a list of reasons for the decline of the oolichans.
- Students participated in a question and answer period during the visit by a local t'fina maker to the classroom.
- Students examined a map provided by the 'Namgis Treaty researcher and found and traced the ancient grease trail that was walked by 'Namgis past and present.

- Students created a miniature model of a lap'is – oolichan pit.
- Students created a web of their prior oolichan knowledge and their post instruction oolichan knowledge.
- Students demonstrated the Kwakwaka'wakw teaching of 'mayaxa'la'- (respect) for their parents and elders at the final celebration by extending a personal invitation, getting chairs, setting tables, preparing plates of food and serving elders.
- Students exhibited 'mayaxa'la' (respect) to the elders and community members who visited the class during Traditional oolichan knowledge lesson and the culminating celebration.
- Students created a dzaxwan-oolichan drawing using traditional elements of Kwakwaka'wakw art.



Figure 47. Kwakwaka'wakw dzaxwan design created by student.

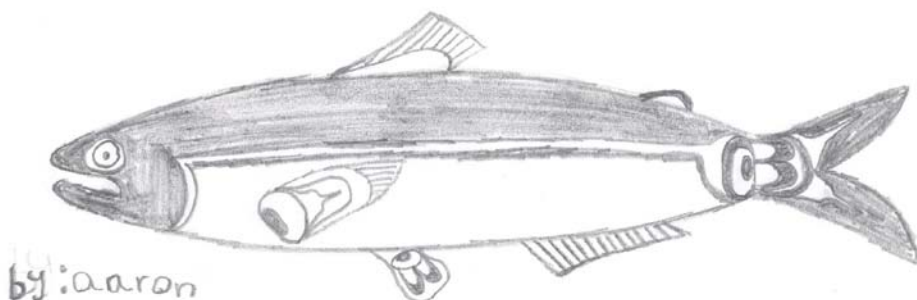


Figure 48. Kwakwaka'wakw dzaxwan design created by student.

This science curriculum included the science processes of observation, measuring, questioning, building models, recording, predicting, interpreting information and communication. During the lessons students were either given fact sheets with information that was the focus of the lesson or expected to listen to the information that was shared by the teacher or community members. They were expected to read and then discuss the process involved in each of the lesson topics. They were asked questions and they also asked their own questions to show their understanding of material presented. Students also observed photographs and came up with questions from what they could gather from the photo. Students made interpretations after receiving information about certain topics. For example when I asked, “how much t’lina do you think they got out of the extremely large pit” the boy who responded “*How do you know the pit worked, if it was so deep, maybe it didn’t work?*”

While gathering research for this curriculum the community members who I interviewed all stated that they were shown what to do, and when the old people felt they (the learner) was ready then they were left to do the job. From a First Nations perspective this was a very formal process. During the creation of the miniature lap’is-pit students were guided by a knowledgeable community member. In earlier years, children experienced the sharing of oolichans, the distribution of oolichans throughout the community, and would have learned how to show

respect to the oolichans as part of the oolichan grease rendering process. The teaching took place as day to day living happened. The valuable dzaxwan knowledge continues today with the families that continue to travel to Dzawadi – Knight Inlet. The sad fact today is that less than a dozen children have the opportunity to experience the dzaxwan teachings where as in the past all Kwakwaka'wakw children enjoyed and experienced dzaxwan teachings in Dzawadi.

It has only been in the last five years that First Nations and Traditional Ecological Knowledge (TEK) have been included in the ministry of education's Prescribed Learning Outcomes. Evaluation processes mentioned in these PLO's take into account the methods that were traditionally used as mentioned above. During this unit, I made many observations myself of what students were accomplishing in class. I found myself falling back into wanting to just evaluate students using methods I learned during teachers' training. I created a quiz and asked them to fill out the questions. I realized later that all this information would have come out in the final knowledge web they created at the end of the unit. The original intent of my research to integrate both tradition and western science teaching and learning techniques. It is hard to break old methods of teaching and evaluation. The majority of students came away from this unit with a greater understanding of Kwakwaka'wakw dzaxwan and the care we need to take of our environment so we can maintain our traditions.

CHAPTER 5 Summary and Implications

Purpose

The Kwakwaka'wakw sustained themselves for thousands of years prior to contact because of their mayaxa'la – respect for the land, water (both fresh and salt) and the resources that were found in their territory. The dzaxwan – oolichan and t'lina- oolichan oil was and continues to be a staple of the diet and much more. It was used for medicine, trade and there is a ceremony that is dedicated to the giving away of t'lina, called t'linagila. Within Kwakwaka'wakw culture this particular potlatch ceremony was the biggest (most prestigious) a chief could host. It is this Traditional Ecological Knowledge that has helped to sustain First Nations people along the BC coast.

It was with the guidance and willingness of t'lina makers to pass on their knowledge regarding the preservation and rendering of the oolichan oil that led to the creation of the cross-cultural science unit Gwayilelas – How we do things Kwakwaka'wakw Dzaxwan. The curriculum was pilot tested at the 'Namgis First Nation band operated T'hisalagi'lakw School. The 18 Kwakwaka'wakw participants were from a grade 6/7 class.

Overview of Curriculum Experience

A crucial link in the development of the dzaxwan curriculum was the willingness of the knowledgeable community members who were interviewed to share their Traditional Ecological Knowledge and Wisdom regarding the dzaxwan. All the interviewees discussed the Kwakwaka'wakw teaching of 'mayaxa'la'- treating others, nature, plants, animals and all things the way you would like to be treated (respect).

The students were introduced to both Kwakwaka'wakw teachings and Modern Western

Science concepts regarding dzaxwān (oolichans). Many areas of Kwakwāka'wakw dzaxwān traditions were explored through oral history. It was explained to the students that these stories are sometimes called myths or legends, but these stories tell of the history of different Kwakwāka'wakw supernatural ancestors and teachings regarding the preservation, preparation of the oolichan along with the rendering of oolichan oil - an important staple in the diet of many First Nations on the BC coast. Finally students explored the many uses of the t'łina such as; medicinal, trade, and t'łinagila the giving away of t'łina at potlatches.

There were some concepts that were explored that were consistent between Modern Western Science and Traditional Ecological Knowledge. They included; predator/prey relations, good habitat, loss of habitat, conservation, sustainability, decomposition, heat and temperature, boiling point, and preservation of food sources. It could be possible in the future within this unit or after this unit to focus on the TEKW, specifically 'Mayaxala' the caring for and respect for the land. Another area to consider would be the development of a unit on heat and temperature using the dzaxwān as a catalyst for exploration. Concepts could include abstract science concepts that included in the elementary and high school science program, but are difficult for students to understand such as hot and cold, heat and temperature, the measurement of heat, and the theory of kinetic energy (molecules in motion).

In this study local elders and resource persons with TEKW were called upon to visit the class and share their knowledge. The TEK and Western Science lessons were woven together to educate students that the two are equally important, and can at times complement one another.

In the future it is hoped that other First Nations communities and non-First Nations teachers will be able to use the dzaxwān curriculum as a focus of instruction. The concepts and

themes of instruction will vary depending on the age of the students, the cultural mix of the class, the teacher's own knowledge about the subject, and also the ability of teachers to find local resource people in the community with the knowledge to enhance what is found in the dzaxwan curriculum.

The long-term goal is to teach science concepts and process so that non-Native students might be introduced to indigenous science knowledge and in particular their practice of respect and sustainability of the land and resources; and both First Nations and non-First Nations students will be successful in school science.

Significance Of The Study

T'sadzisnukwame' [New Vancouver]. That's sea grass. That was another good food. It's down under the water on the beach. You use to peel it. My husband used to go down with a pole and turn it around to pull it up with a root. And then clean it and put it on a plate and eat it with oolcahen grease. There's just a few ladies know how to clean that. Maybe someday no one will know about that.

The latter is an elegant statement of Kwakwaka'wakw awareness of the fragility of knowledge – knowledge that unlocks the value and utility of land. Traditional knowledge embodies the unique relationship between the Kwakwaka'wakw and their territory.
(Galios, 1994b, p. 10)

The above statement made by an elder in Alert Bay in 1981, "Maybe someday no one will know about that," made me think back to the list of food resources in the Red Binder entitled "Seasonal Food", (1974). There are many native foods listed in that binder that are not gathered anymore by people in our village. It would be a great loss to our people if, someday no one will know about the dzaxwan – oolichan.

One of my dreams when going through my teacher's training at Simon Fraser University was to eventually teach our own children our own Kwakwaka'wakw history and culture. Due to my own lack of high school science courses I was unable to achieve a Minor in Biology as part of my B.Ed., which was my original goal. By creating Gwayi lelas, "How We

Do Things: Kwakwaka'wakw Use of Dzaxwan" I gathered and then shared the knowledge about this one resource and showed the children our own peoples' science. This may bring some of our students to want to explore other science areas.

With very few Kwakwaka'wakw teacher resources readily available to teachers in Alert Bay and on Northern Vancouver Island, it is hoped that an important outcome of this research will be the development and evaluation of usable curriculum resources for the Kwak'wala speaking people, as well as other communities. As MacIvor (1995) states "Because of the under-representation of our peoples in the sciences, and the great need for scientific and technological skills within our communities, efforts to encourage Aboriginal participation in school science are crucial" (p. 74). Following MacIvor, I believe that it is crucial that First Nation students participate in school science and as a 'Namgis First Nation educator and a parent I see the need for such curricula to be developed. Going through the process of writing this paper I find myself struggling with the challenge of finding where Kwakwaka'wakw Traditional Ecological Knowledge fits in Western Science or trying to make it fit. Looking at the Ministries' Science PLO's (2005) and attempting to see where this dzaxwan - oolichan TEK fits, I have come to the conclusion that it does not have to fit perfectly in order to be useful. Kwakwaka'wakw Science or TEK is what has sustained our people on this coast since the beginning of time. It can stand alone, it can stand beside western science, but it does not have to fit within it. While coming to this conclusion I know from experience that we First Nations people sometimes give less credit to our own knowledge and ways of viewing the world; I often remind myself that our people would have not successfully lived to see 2009 if it had not been for our ancestors' way of life.

The stories that the elders spoke over and over again of the main Kwakwaka'wakw

teaching of mayaxa'la "respect". The information that the elders and resource persons shared with me illustrates our First Nations peoples (specifically Kwakwaka'wakw) traditions and especially understanding of the natural world and how if you took care of it (nature) it would take care of you. It is our job as educators to find the balance between traditional teachings and the academics that our children need.

While teaching the grade 6/7 class at T'lisalagi'lakw school it became apparent to me that we need to begin to teach our children as soon as they enter our school the following, 'Namegan's om dlu'wans awinagwisex – We are one with the land. These words were shared this summer by our 'Namgis chief William Cranmer as our people returned to many of our traditional village sites within our territory. I was so excited by the knowledge that was shared about what our people did at such places like; Anutz lake, Wa'as lake and the Gwani River, visiting areas where traditional food was gathered and learning about the plants that our people used for medicine. I imagined visiting these sites during the school year and ensuring that our children would know the teachings of our ancestors about the land. The passing on of this valuable traditional knowledge would give our children a sense of belonging and knowledge of who they are as Kwakwaka'wakw.

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APENDIX A

**Science K – 7 Topics at a Glance
British Columbia Ministry of Education**

INTRODUCTION TO SCIENCE K TO 7
SCIENCE K TO 7: TOPICS AT A GLANCE

	Processes and Skills of Science	Life Science	Physical Science	Earth and Space Science
Kindergarten	<ul style="list-style-type: none"> • Observing • Communicating (sharing) 	Characteristics of Living Things	Properties of Objects and Materials	Surroundings
Grade 1	<ul style="list-style-type: none"> • Communicating (recording) • Classifying 	Needs of Living Things	Force and Motion	Daily and Seasonal Changes
Grade 2	<ul style="list-style-type: none"> • Interpreting Observations • Making Inferences 	Animal Growth and Changes	Properties of Matter	Air, Water, and Soil
Grade 3	<ul style="list-style-type: none"> • Questioning • Measuring and Reporting 	Plant Growth and Changes	Materials and Structures	Stars and Planets
Grade 4	<ul style="list-style-type: none"> • Interpreting Data • Predicting 	Habitats and Communities	Light and Sound	Weather
Grade 5	<ul style="list-style-type: none"> • Designing Experiments • Fair Testing 	Human Body	Forces and Simple Machines	Renewable and Non-Renewable Resources
Grade 6	<ul style="list-style-type: none"> • Controlling Variables • Scientific Problem Solving 	Diversity of Life	Electricity	Exploration of Extreme Environments
Grade 7	<ul style="list-style-type: none"> • Hypothesizing • Developing Models 	Ecosystems	Chemistry	Earth's Crust

Figure 49 Science K – 7 Topics at a Glance, British Columbia Ministry of Education.

APPENDIX B

Sample Lesson 5 from

Gwayi lelas "How we do things" - Dzaxwān Unit

Created by

Donna Cranmer and Natika Bock

Dzaxwan Unit

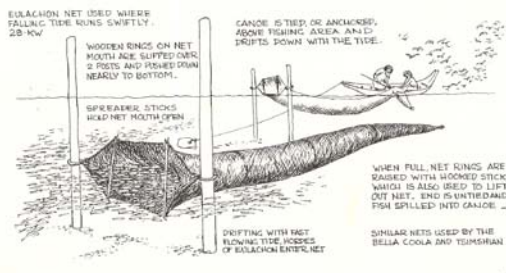
Lesson 5 Oolichan Fishing



Drag seining at Knight Inlet (1997)



Using a dip net to move oolichans (1997)



Drawing of Tagat in use - pre contact



Tagat in use at Knight Inlet 2002

1. Lesson 5 Oolichan Fishing
2. L5 Fact sheet
 - Kwakwaka'wakw Words of Thanks to the oolichan
 - A - Tagat (pre-contact)
 - B - Drag Seine
3. Fishing Photographs
 - Photo 1 Drag Seining
 - Photo 2 Drag Seine
 - Photo 3 Tagat (conical dzaxwan net)
 - Photo 4 Tagat (conical dzaxwan net)
4. L5 New Word List
5. Map #1 map of Dzawadi and other Kwakwaka'wakw tribes fishing areas on river

Dzaxwan Unit

Lesson 5 Oolichan Fishing

Key Concepts

- ✓ Kwakwaka'wakw preparation of self prior to fishing (bathing- Twin Falls)
- ✓ The design of oolichan fishing nets and their evolution over time
- ✓ There are different oolichan fishing techniques and appropriate nets that are used depending on the river
- ✓ Traditional knowledge is not static
- ✓ Fishing methods have continually evolved as new technologies have been developed

Understandings

Students will be able to;

- ✓ Describe what Kwakwaka'wakw do to prepare self prior to fishing (bathing- Twin Falls)
- ✓ Describe oolichan fishing technologies
- ✓ Describe what changes happen in the environment and how this affects the fishing method used.
- ✓ Compare aggressive and passive fishing techniques

MATERIAL

- ✓ Photos of the different fishing methods
- ✓ DVD T'ina the Rendering of Wealth
- ✓ Miniature samples of:
 - Tagat,
 - Drag seine,
 - Dip net
- ✓ Fact sheets with words of thanks and beliefs about oolichans
- ✓ Arrange for Knight Inlet t'ina maker to visit class and discuss methods used in fishing oolichans and what changes they have seen during their years up in Dzawadi

Teacher Information / BACKGROUND

The sea life, particularly the salmon, the oolichan (pronounced: oo-la-kin)-a silvery, smelt like fish-and the cedar tree are among the resources in the natural environment that have long made the Kwakwaka'wakw both spiritually and materially rich. (Indian, 2006) All of the Kwakwaka'wakw tribes have their origin stories which tell of how their first ancestors came to inhabit their territory. In Lesson 2 we read Chief Billy Assu from Cape Mudge story of how his people in ancient times after the flood came to live near the Klinaklini River for a period of time. This ancestor Weka'yi met a woman named T'isda'k and she had wings on her back on the Klinaklini. The woman T'isda'k eventually allowed Weka'yi to build a house and make t'ina every spring (Duff, Prior to 1965b). Oolichan continue to be gathered on two rivers in Kwakwaka'wakw territory the Klinaklini and Kingcome. "Traditional food keeps the link between the land and our health." (Kuhnlein, 2005) The Klinaklini River is the traditional territory of the Awaetlala and Tenaktak. Although this territory belonged to these two tribes, during oolichan fishing time they allowed fourteen Kwakwaka'wakw tribes to have their own camps to harvest the oolichan. See Map 1. Oolachan sites, Klinaklini River (Galios, 1994, p. 137) which shows the fourteen Kwakwaka'wakw tribes camp.

Words of Thanks

It is important to note that in the next section talking about "Kwakiutl religion" as Boas calls it, I use the term words of thanks (Webster, 1987), it was explained to me that our people had three types of giving thanks, the English word prayer is now used for all of them. The Religion of the Kwakiutl Indians Part 1- Text and Part II - Translation gives words of thanks that were said for many of the day to day activities which Kwakwaka'wakw men and women participated in. Giving words of thanks was part of everyday life. Today when families leave Alert Bay to go to Knight Inlet they will stop at a place called Twin Falls. This is considered an important site to stop at on the way up to make t'ina. The old people would stop and wash themselves in the falls and ask for all sickness to leave their bodies. They were preparing themselves spiritually for the work ahead. Boas has collected the prayer to a waterfall at Dza'wade (1930, p. 184). Kwakwaka'wakw seasonally gathered the natural resources which surround them, always giving words of thanks before taking anything. The following words of thanks (prayer) shows the appreciation and mayaxala given to the resources which were seen as willing to give themselves to the Kwakwaka'wakw for their nourishment and life.

Prayer of a man hauling the first dip net full of oolichen

Now you have come, grandfather,
 You fish, that you may not ill-treat me,
 That you may only bring good luck by your coming to me,
 Supernatural Ones, you Dancers,
 I pray you, Supernatural Ones,
 That we may meet again next year and,
 Please protect me, friend, you fish

(Drake & Wilson., 1991, p. 7).

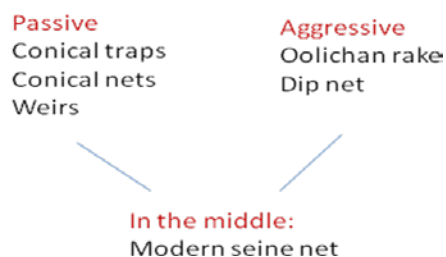
Once the words of thanks were given by the chief with the rights to catch the first oolichen he began the ritual associated with this right. Erna Gunther (1928), gives a detailed description of this ritual.

The Head Chief of the clan flyers of the Dena'xda x has the right to be the first to dip in his net when the oolichen first appear.....The daughter of the chief has to be the first to string up the first oolichen to dry. (Gunther, 1928, p. 172)

Although fishing for oolichen is a continuation of a tradition that goes back to origin stories, the fishing techniques, methods and tools have been continually updated as new technologies have developed . The objective of this lesson is to look at the different oolichen fishing technology, to explore the pros and cons of each one. To discuss why today (2009) Kwakwaka'wakw who fish in Dzawadi - Knight Inlet went back to using the tagaḷ - conical net. What factors would be taken into consideration to change from a drag seine net to a conical net?

Procedures

Fishing techniques can be broken into two main categories: passive and aggressive.



The passive fishing techniques were stationary and they relied on current, tide and fish schooling. Whereas the aggressive methods were more deliberate, active, and imposing. The modern seine net is an example of passive and aggressive fishing.

Fishing techniques:

Eulachon rake
 Conical trap
 Dip net
 Conical net

Fishing Technology	Material it is made of
<i>Eulachon rake</i>	<i>Wood with wooden or bone needles</i>
<i>Conical trap</i>	<i>Cedar wood and branches, and spruce roots</i>
Conical net	<i>Nettle rope (very labour intensive)</i> Nylon net (purchased at net company)
<i>Weir</i>	<i>Stone or pole, these were fence-like structures would direct the fish into an area where they could be speared or caught in nets</i>
Dip net	Bought at store and handles are replaced with handmade ones
Seine net	Netting and weights

Blue indicates ancient technologies of fishing Oolichan that are no longer practiced in contemporary times.

First students are to discuss the pros and cons of each of these methods. Things to consider: labour involved, limitations of the tool, available of the resources to make the tool, best use of tool, water levels, fish schooling, etc.

Fishing is a dynamic process that involves awareness and foresight. As fishing conditions change continuously (hourly, daily, yearly, etc.), it is imperative that one knows how to use their fishing tools in the most efficient ways. It is also important that they take into consideration other factors (such as schooling behaviour, water level, time of day, tec.) so that they may effectively fish.

View the oolichan fishing section of the DVD T'ina the Rendering of Wealth (about 10 minutes) and after viewing have students brainstorm and record questions about the methods of fishing how they may have changed over time.

Invite local knowledgeable Tłina maker to visit the class and share their experiences fishing for oolichans. Ask the visitor explain fishing with a

- Tagat,
- Drag seine,
- weir
- Dip net

Using the miniature samples. Have students ask questions and record the information shared.

This lesson will take 2 - 45 minute classes.

NOTE ABOUT PRINTING FACT SHEETS with letters & numbers

When printing photo fact sheets A, B & C and Photos 1 to 6, you will need to change the setting so that each picture fits on an 8.5" by 11" page. Click on file, then click on page set up and change to landscape. Next click on the picture and drag the right bottom corner until the picture fills the whole page.

Enrichment Activities

- Plan to visit an oolichan fish camp during the spring time when the oolichans are returning to the rivers. It is important to remember to ask permission of the tribe whose territory that the fish camp is in. A lot of preparation would go into such a trip, a great opportunity for learning.
- Create models of fishing methods
 - Tagat - conical net
 - Drag seine
 - Dip net
 - weir

Dzaxwan Unit

Lesson 5 Oolichan Fishing

Fact sheet: Kwakwaka'wakw Words of Thanks to the oolichan

Kwakwaka'wakw men and women said words of thanks for many of the day to day activities. Giving words of thanks was part of everyday life. Many people call these words of thanks "prayers".



Twin falls (1960)

Today when families leave Alert Bay to go to Knight Inlet they will stop at Twin Falls. This is considered an important site to stop at on the way up to make t'ina.



Twin falls (1970)



Twin falls (1997)

The old people would stop and wash themselves in the falls and ask for all sickness to leave their bodies. The following words were repeated while stopping to go through Twin Falls on the way to Knight Inlet. They were preparing themselves spiritually for the work ahead. Boas has collected the prayer to a waterfall at Dza'wade (1930, p. 184) Art Dick remembers as a boy travelling to Dzawadi with his grandfather and stopping at twin falls and hearing the following words said while they washed in the falls.

"Dzuxudaxan t'sit'sak'ulam numase" Wash my sickness away
(words shared by Arthur Dick . 2008 interveiw)



Washing at Twin Falls (1997)

The name describes the two water falls that flowed side by side heading up to Knight Inlet. As can be seen in the photos by 1997 there was only one of the falls running. Oolichan fishing families continue to stop and say the words as they wash them selves in the falls.

Kwakwaka'wakw seasonally gathered the natural resources which surround them, always giving words of thanks before taking anything. The following words of thanks (prayer) show the appreciation and mayaxala (respect) given to the resources which were seen as willing to give themselves to the Kwakwaka'wakw for their nourishment and life.

Prayer of a man hauling the first dip net full of oolichen

Now you have come, grandfather,
 You fish, that you may not ill-treat me,
 That you may only bring good luck by your coming to me,
 Supernatural Ones, you Dancers,
 I pray you, Supernatural Ones,
 That we may meet again next year and,
 Please protect me, friend, you fish

(Boas 1930:204, Drake & Wilson., 1991, p. 7).

Here is another example of a prayer to the Dzaxwān in the Kwak'wala language.

Prayer to the Dzaxwān

'Wa, Ġilakas'la mā'esila, yu'tłaxs gaxa'eḡ,
 gaxeyus gigigamayas a'ikadzalisa s̄an's 'nalax,
 k̄an itide' duḡwatt̄alaxdaḡwu't̄ k̄an gaxe' kakis'uḡwsilasgan
 kis'uḡw ḡa gale' 'utid loḡ, mā'esila.

Ninakiti k̄a's waxa'us gaxan k̄an itidiḡ duḡwatt̄alat̄ut̄ax
 k̄wis̄a'yānxt̄la k̄asu' gaxt̄t̄ a'eda'aḡat̄
 laxus a'ikixdamisaḡus mā'esila, 'nikaxs la'e dax'itsis
 ḡamxuḡtsana'yi laxa lix'ane' kwaxt̄la'wexa a'ixbes aḡpsba'yi.

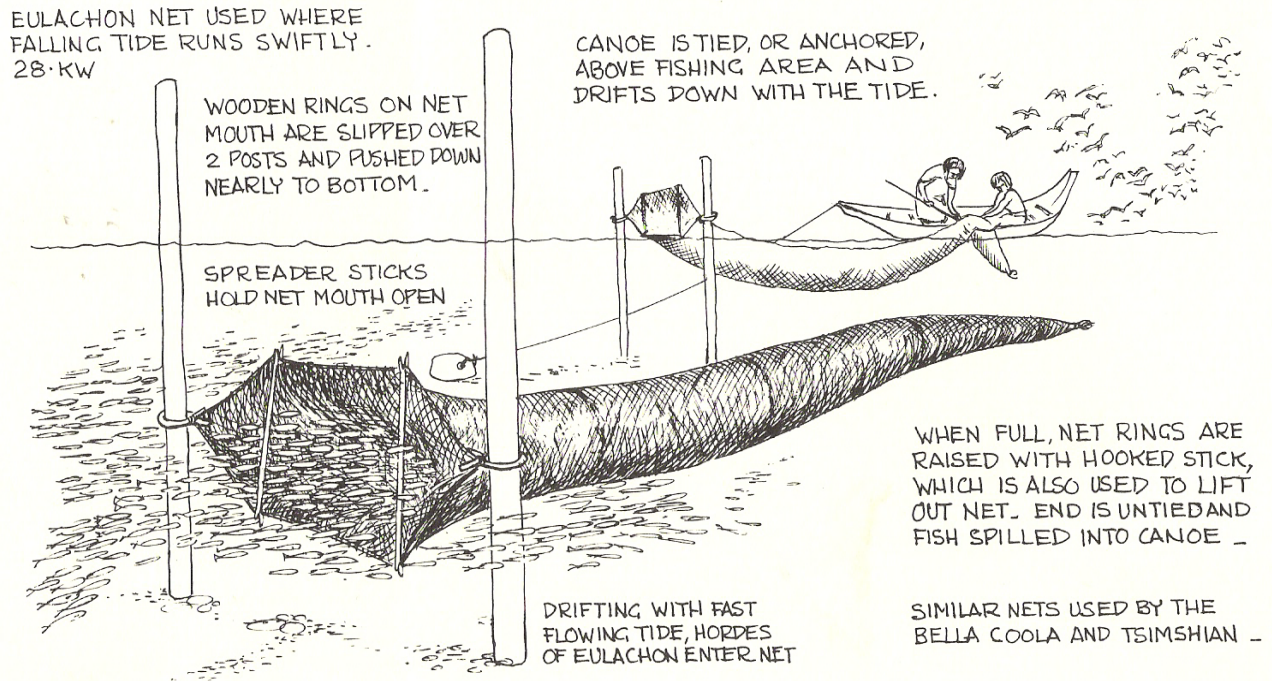
We, le' dax'itsis hiḡkuḡtsana'yi laxa dzaxwān k̄a's
 ḡḡukugusto'disis k̄uma lax ḡamxuḡtaḡawa'yasa dzaxwān.

We', he'mis la d̄lanx'id̄a'atsis a'ixba'yasa ḡs̄amtsa'yase'
 kwaxt̄la'waxa gaxe' hixsala lax s̄am'sasa dzaxwān.

We, a'mise la 'naxwa he gwigila ḡa w̄a'okwe'.
 We, la'am d̄ḡigad̄as 'ud̄akw ḡs̄amdaḡ laxex.

We, la'am laba.

Dzaxwan Unit

Lesson 5 Oolichan Fishing
Fact sheet A Tagat (pre-contact)

Drawing from Indian Fish by Hilary Stewart (1977)

Dzaxwan Unit

Lesson 5 Oolichan Fishing
Fact sheet B Drag Seining

The net is let go off the punt and the crew on the beach pulls the seine net in. Knight Inlet (1997)

Dzaxwan Unit

Lesson 5 Oolichan Fishing
Photo 1 Drag Seining

Edgar Cranmer (10 years old) using dip net to move oolichans from seine net to punt Knight Inlet

Photo Credit: Barb Cranmer, 1996

Dzaxwan UnitLesson 5 Oolichan Fishery
Photo 2 Drag Seine

Drag seining for dzaxwan on the Klinaklina river. Crew moving the seine net up the beach after a set.

Photo credit: Barb Cranmer (1997)

Dzaxwan Unit

Lesson 5 Oolichan Fishery

Photo 3 Tagat (conical dzaxwan net)



Art Dick's tagat (conical net) in the KlinaKlina River, Knight Inlet 2002. The river is running out and the tagat opening is facing the mountains.

Photo credit: Arthur Dick Jr.

Dzaxwan Unit

Lesson 5 Oolichan Fishery

Photo 4 Tagat (conical dzaxwan net)



Art Dick's tagat (conical trap) in the KlinaKlina River, Knight Inlet 2002 We are viewing the back end of the tagat.

Note: that the tagat is not anchored onto posts in the river as seen in the tagat drawing. It is anchored to a tree and stump on either side of the river.

Photo credit: Arthur Dick Jr.

Dzaxwan Unit

Lesson 5 Oolichan Fishing

New Word

Aggressive fishing - Fishing techniques are more deliberate, active and imposing.

Dip net - A hand held net at the end of a long pole.

Drag seining - a long net that has led line (weights attached) to hold down the bottom of the net and corks are on top. This method of fishing has; a crew on the beach and the net is on a boat/punt. The net is let go from the boat in a semi-circle. Once the net is off the boat, the crew on the beach pulls in the led line and the catch is moved onto the boat.

Dzuxudaxan t'sit'sak'ulam numase' - Wash my sickness away, these words are said by Kwakwaka'wakw as they prepared themselves spiritually for the work in Dzawadi - Knight Inlet

Passive Fishing - Fishing techniques are stationary and they rely on current, tide and fish schooling

Tagał - a conical net created from net. Prior to contact Nettle rope was used to create the tagał (very labour intensive). In the late 1990's Kwakwaka'wakw returned to using a tagał in Dzawadi - Knight Inlet using Nylon net (purchased at net company). The net is anchored in the river and after the oolichans have spawned and drift back down the river they are caught in the net.

Twin Falls - two waterfalls that flowed side by side just before reaching the flats at Knight Inlet. A place where Kwakwaka'wakw wash themselves and prepare themselves spiritually before going into Dzawadi - Knight Inlet.

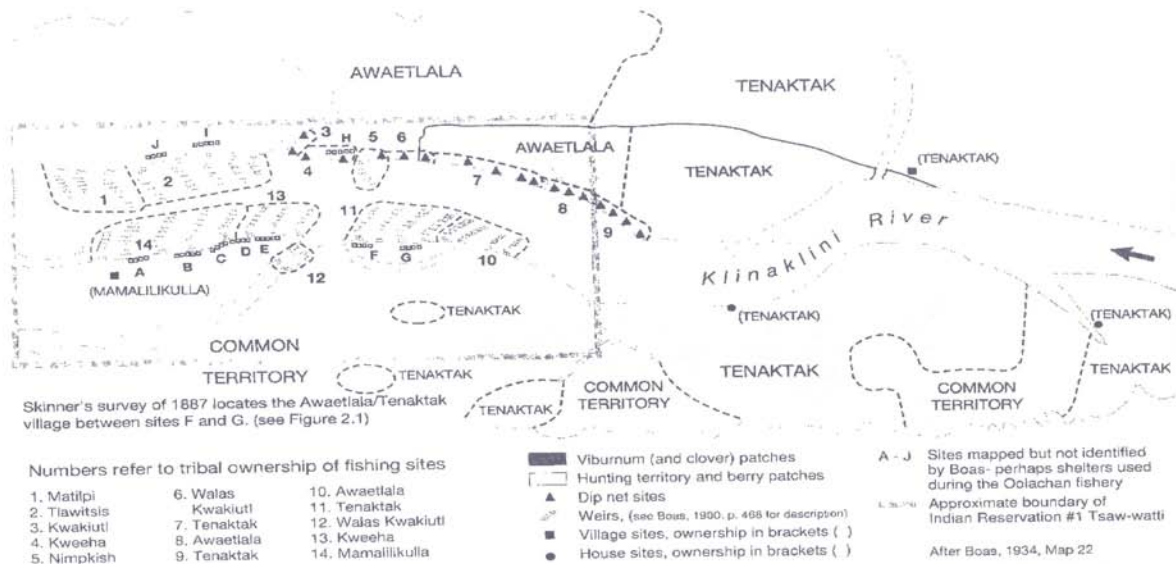
Weir - using stone or wooden poles, these fence-like structures would direct the fish into an area where they could be speared or caught in nets.

Words of thanks - prayer or words said prior to taking resources from nature.

Dzaxwan Unit

Lesson 5 Oolichan Fishing

Map #1 Dzawadi - Knight Inlet



Map #1 Oolachan sites, Klinaklini River (after Boas, 1934, Map 22)

NOTE : This area is the traditional territory of the Awaetlala and Tenaktak tribes. These two tribes gave permission to the other 14 Kwakwaka'wakw tribe to fish for dzaxwan .

APPENDIX C

Kwak'wala Words used in Chapter 1 and 2

Kwak'wala Words used in Chapter 1 and 2 and their meaning

Kwak'wala Words and their English meanings

*NOTE – there are different ways to write the Kwak'wala language. The orthography used in this paper was created by Jay Powell and Gloria Cranmer for the U'mista Cultural Centre.

The * followed by [] means this is a different Kwak'wala writing system.

Axu – My great Grandmother Agnes Alfred's granny name, which is different from her real Kwak'wala name.

Dlu - and

Dzawadi – Knight Inlet

Dzaxwan - oolichans

Gigukwdzi – more than one bighouse

Gilakas'la – welcome or thank you

Gwa'ni – Nimpkish river

Gwayi lelas – how we do things

Gwa'nalis – the 'Namgis man who was changed into the river Gwa'ni by Kaniki'lakw

Gwi'mo'las – Vera Newman's Kwak'wala name (my mother)

Kaniki'lakw – the transformer (creator) from one of the 'Namgis Creation stories

*[Kumaciy] kumatsi – barbecued clams

Kwagul – the name of the people (tribe) who come from Fort Rupert. This tribe name has several different spelling; Kwaguilth, Kwakiutl. Also the name used to talk about all the different tribes who spoke Kwak'wala by anthropologist and the government in the early days. We all have our own tribe names.

Kwak'wala – the language spoken by the First Nations people living on the north end of Vancouver Island and the adjacent main land. Spoken by 15 tribes in this area)

Kwakwaka'wakw – the people who speak Kwak'wala

Łaxwesa'wa- strength of the river

Nalaga – have to do with day break (new day)

‘Namgis – the First people of the Nimpkish Watershed and Nimpkish valley, the majority of the Namgis live in Alert Bay today. Previously call Nimpkish.

‘Namgiyaxsaman – a ‘Namgis woman

Nugwa’am – I am

Owaxalagalis – Chief Roy Cranmer’s chief name

Pal’nakwala Wa’kas – Chief Dan Cranmer’s chief name, now held by his eldest son Doug Cranmer

T’lisalagi’lakw – is the mink who is the son of the sun in Kwak’wala oral history. It is also the name of the ‘Namgis First Nation school in Alert Bay.

U’mista – the return of something important. The name of the Cultural Centre in Alert Bay, which houses the potlatch collection, the cultural objects which were taken by the Canadian Government in 1922.

Wanuks - river

Whe-la-la-u – many tribes. The name of the area council which represents four different Kwakwaka’wakw tribes in Alert Bay.

‘Yalis – the name of Alert Bay (literal meaning women with legs spread on the beach)

Xanukwas – the child of

APPENDIX D

The Jesup North Pacific Expedition edited by Franz Boas
Memoir of the American Museum of Natural History, New York
Volume V

II. The Kwakiutl of Vancouver Island by Franz Boas
(1975).

The following information regarding dzaxwan – oolichans was found in The Jesup North Pacific Expedition edited by Franz Boas. Memoir of the American Museum of Natural History, New York. Volume V
 II. The Kwakiutl of Vancouver Island by Franz Boas(1975).

Nettle (p.370 – 371)

Nettles are cut in October. Formerly a bone knife was used for this purpose. The plants are cut off close to the ground. Fifty stems of nettles are placed in a heap, and are tied together with split cedar-bark in four places, at about equal distances. These bundles are taken home, the tying is undone, and the stems are split with the nail of the thumb. Then they are spread out and coiled up. The coiled nettle-stems are hung over a long pole such as is used for punting canoes, the pole being laid with one end on the ground, while the middle rests on the edge of a box. Then the pole with the nettles on it is placed on a drying-frame, where it is left exposed to sun and wind. In the evening the nettles are covered over with mats so as to keep the dew off. After from four to six days the nettles are dried and taken to the house. There they are uncoiled and placed on a mat which is spread on the drying-frame by the fire, but a little aside from the fire, so as to prevent them from becoming too hot. Next the nettles are broken, and the inner part is pulled off from the cortical fibers. As soon as the fibers are clean, they are put down on a mat. The fibers of fifty nettle stems are thus placed together. Then they are bent over in the middle and the two parts are loosely twisted together. They are placed on a board and beaten with the butt-end of a small wedge until all the fragments adhering to the fibres drop off, and the fibres themselves are entirely separated. Then the nettle is placed in a basket, untwisted, and rubbed thoroughly. Then it is combed over the rib-bone of a bear, which is held in the right hand, while the lower end of the fibre (that is, the end taken from the lower end of the plant) is held in the left hand, the second, third, and fourth fingers of the right hand pressing the fibre at the same time firmly against the edge of the rib-bone. Then the fibre is pulled up and down over the edge and it is quite clean and well separated.

Spinning (p.372 – 374)

The process of spinning is practically the same for all the various kinds of fibre heretofore described. As an example of the method of treatment in spinning, I will describe the making of nettle-thread.

When the nettle fibre has been prepared, a stake of yew-wood a little over a metre long and 5 cm. in diameter is carefully polished, and driven into the ground so that it stands in a slanted position. The woman who intends to spin the fibre sits on the floor in such a position that the pole slants away from her. The nettle-fibre is tied to the top of the stake with cedar-bark, so that the lower part of the fibre is on top. Then she gathers the loose fibre in her hands and winds it around the stake spirally. A small box about 25 cm. long and 15 cm. high is put down on her left-hand side, and a dish containing fine sand is placed on her right-hand side. Then she takes a number of fibres out of the bunch, pulling them out from below, and coils them in the box on her left. While she is holding

the end of these fibres in her left hand, she takes out another small bunch of fibres, according to the thickness of the thread that she intends to make, and twists the end of the first and of the second bunch together. Thus she continues until a long string is coiled up in the box. After about one fathom of string has been coiled up there, she sprinkles some sand over it. A number of boxes are filled in this way. The fibre which is thus prepared is then spun by means of a spindle (Fig.67).

The shank of the spindle is two spans and four fingers long. It is made of maple-wood, which is quartered. The shank of the spindle is made out of one quarter. The shank is a little thicker in the middle than at the points, and is thoroughly dried before it is used. The spindle-whorl is made of bone of whale, the anterior part of the skull-bone being preferred. It is ground down on gritstone. Then it is polished, and finally rubbed with deer-tallow. The size of the spindle-whorl differs somewhat, according to the size of the thread to be made. The sizes of those in the Museum collections range from 7 cm. to 8 cm. in diameter. They are not decorated. Many of the spindle-whorls from the west coast of Vancouver Island (Fig.68) are decorated with geometrical and realistic designs. Most of these are also made of bone of whale, while a few are made of wood and of stone. Geometrical motives, like those represented in Fig.68, b, d, e, do not seem to occur in spindles made by the Kwakiutl. All those I have seen are flat, like Fig.68 f and g. The human figure on the specimen shown in Fig.68, a, corresponds in style to the other decorated tools of the Nootka.

It is remarkable that the spindle-whorls from this whole region are all small, while the spindles used by the tribes of the Fraser River region are very large.

When spinning, the woman holds the spindle in her right hand. The end of the nettle-string is hung over the edge of the box, and the end is twisted around the spindle-shank close to the reel. Then she rubs the spindle down the shin of her right leg, first resting the tip of the shank between thumb and first-finger of her left hand, but holding the thread, as soon as the spindle begins to twirl around, at a distance of about 30 cm. above the spindle (Plate XXVII, Fig.2). Thus about 30 cm. of fibre are twisted into fine thread, which is then wound up close to the reel. Then she takes another 30 cm. of fibre out of the box, and proceeds in the same manner until a large ball of thread has been wound on the spindle. Then the ball of thread is taken off and put aside. In spinning nettle-fibre, four different sizes of thread are recognized.

The thread that is used for netting and for other purposes is made of two of these single threads spun together. This is done in the following manner. Two balls of the single string are placed in a box on the left-hand side of the woman. The ends of the thread are tied on the shaft of the spindle close to the reel. Then she holds the two threads in her left hand, - one between thumb and first-finger, the other between the third and fourth finger. As soon as she holds them this way, the spindle is twirled along the right leg of the woman, but upward instead of downward. Thus the two strings are twisted together, and the twine which is thus obtained is rolled up on the shank of the spindle.

This method of spinning is also used for making thread of yellow-cedar bark and of mountain-goat wool. In making the first thread of yellow-cedar bark, the beaten fibre is often hung over the right arm instead of over a yew-wood stake. The fibres are taken off, their ends twisted together and the thread coiled up in a box.

Thread of mountain-goat wool is either all wool or made around a central thread of yellow cedar. Often two women join in preparing thread for spinning. The loose wool is piled on a mat. One of the women holds the cedar thread and puts some wool around it. The other one takes the prepared fibre out of the hand of the first one and rubs it down her thigh with the palm of her hand, thus covering the cedar-bark more firmly with the wool. This thread is spun in the same way as described before.

It was told sometimes four women work together to make the double thread very tight and strong. The first of the women spins the double thread with a spindle on her shin. The second one sits at her right side, but facing her. She works the same twine, rubbing it upward on her thigh. The third one sits farther to the right, facing the second one; the fourth one, still farther to the right again facing the third one. Each continues the twisting of the thread on her thigh. In olden times dog-hair was mixed with wool to make yarn. Thread for sewing and tying is also made of whale-sinew.

Netting (p.399 - 400)

Netting needles are made of alder or willow. A piece of wood between two branches is cut off, and is halved for large netting needles, while the smallest ones are made out of quartered wood. The largest size is one span long and one finger and a half wide; the third size, a short span and one finger wide; and the smallest size is as long as the width of the hand and as wide as the little finger. The middle part of the netting-needle is made very thin, so that the light shines through (Fig.90).

Large mesh-measures are made of maple. These are simply flat pieces of wood with long rounded edges, cut off square at the ends, about 4 cm. wide and 7 cm. long; while the next size is a little smaller. The smallest ones are made of rib-bones of a deer, which are cut off in suitable lengths. The larger of these sizes is made of the large ribs, while the smallest consist of pieces of the smallest ribs.

In making the large olachen-net, the woman begins with the finest nettle-twine, using the small netting-needle, on which the thread is wound. First the twine is turned twice around the smallest net-measure. Then it is tied and pulled off from the measure. With this mesh the net is started. A string is tied to the first mesh, and is attached to the end of a short stake which is driven into the ground. The woman nets sitting in front of this stake. In netting, the woman puts the shuttle through the mesh downward, and every mesh is secured by a half-hitch knot. In this way a circle of forty meshes is made. This is to form the end of the olachen net. When the net is about twenty rows of meshes long, a cedar stick about 30 cm. in length is pushed through every other mesh of the first row. A line is tied in the middle of the stick, and it is hung from the poles on which the salmon are dried in the house. When the net gets longer, it is hauled up by means of this line,

and finally it is thrown over the poles. The work is then continued with the next larger net-measure and with a little heavier line. In the beginning work with the heavier twine and the larger net-measure, a piece of red-cedar bark is tied in to indicate the beginning of this portion of the net. Two fathoms and a half are made in this manner. Then the third net measure and a still heavier twine are used for continuing. After two fathoms of this size have been made, the largest netting-needle, the heaviest twine, and the largest measure are used and three fathoms more are made. The edge of the large net is made of double twine with the large netting-needle, the size of the net is the same as that of the end of the net. After one round of these meshes has been made, they are tied up with a double knot and cut off. A further description of nets will be found in the chapter on fishing.

Kelp Bottles (p.405 – 407)

The best kelp (wa'wade), or bull kelp for making oil-bottles grows on rocks where there is a swift tide. The kelp is collected by women in the fall, after the berrying-season is over. They go out in their canoes, carrying a long salmon-hook shaft which is made of red pine. To the end of the shaft a bone knife such as is used for splitting cedar is tied crosswise with a long strip of cedar bark. The Kwakiutl generally go to Green Point to gather kelp for making bottles. They try to reach the place at low water. Then the canoe is anchored about ten or twelve fathoms above the kelp, which is slowly drifting with the tide. The anchor-line is slackened until the canoe is just above the kelp. Then the kelp is cut off from the rock with the bone knife attached to the pole. It is taken into the canoe, and the long leaves are cut off with another knife. This work generally takes so long that it is high water when the women get home. The kelp is dragged ashore by the head, and is placed on the beach with the head towards the house, the thin end toward the sea. Next the kelp is scraped (k'!a'xwa) with a scraper made of cockle-shells. To make the scraper, a large cockle-shell is placed on a stone, and a concave section is cut out of its outer side, so that it fits as nearly as possible the rounded shape of the kelp. Then the woman sits down on the left-hand side of the kelp, looking up from the beach, and scrapes it, beginning at the head, down to the thin end, scraping with the right hand, in which she holds the cockle-shell scraper, and holding the kelp with the left hand. While doing so, she turns the kelp around, scraping all sides and pushes it up towards the house. The scraped kelp is called "kowe'ku."

While the woman is doing this, her husband gathers firewood and makes a frame of hemlock-poles, on which the kelp is to be dried. This frame is put up in the house, or, if the weather is still fair, outside. It consists of two pairs of poles six meters apart, and connected on top by a cross-pole. The distance of the one pair of poles from the other pair is nearly five meters. The kelp is placed side by side over the horizontal cross-poles connecting each pair of uprights. All the heads are directed one way. Then a long fire is built under them. The man takes his place at the head-end of the kelp. The woman takes her place at the thin end of the kelp, and they watch them and pull them along over the frame. If one part of the kelp should shrink too much. The fire is kept up for about two days until all the kelp is properly shrunk. Then it is taken down and laid out on the floor. The man next cuts some pieces of cedar-wood about 5 mm. thick and 3 mm. wide, and

breaks them into pieces about 6-8 cm. long, which are thrown into a small root basket. The man and the woman each coil up one of the pieces of kelp on the floor. So that the head lies in the middle, and the thin end on top. They each take one of the short cedar sticks, take up the thin end of the kelp with the right, and begin to blow into it. When it is as full of air as they can get it, they close the end with the left hand and push the air down with the right hand, taking hold of the kelp between the thumb and first finger, squeezing the tube together firmly, and pushing the hand down towards the thick end. Then more air is blown in, and this is continued until the whole kelp tube is as full as possible. Then the small cedar-stick is put crosswise over the thin end of the kelp, and a few turns of the thin end are wrapped around it so as to close it tightly. Then it is tied up with a strip of cedar-bark. This makes the closure perfectly air-tight. In this way any leaks in the kelp, either made by animals that live on it or that have been made in the process of scraping, are discovered. After the stems of the kelp are filled with air, those that are found to be good are taken outside on a day when the sun is shining. They are scattered in coils on the gravel above high-water mark, or are hung up on poles (see Plate XXIX, Fig.1) and dried by the sun and wind. About noon they are turned over. When they get dry, they are quite white from an efflorescence of salt. In the evening they are gathered together and covered up with mats to keep the dew off. On the following morning they are washed with a rag of an old mat or with soft red-cedar bark dipped in salt water to remove the efflorescence. This is done as quickly as possible to prevent them from being soaked with water again. Then they are dried again above high-water mark. Next a peeled yew-wood stake is driven into the ground on the beach, close to the place where the kelp is drying. The stake is about 60 cm. long, and it is driven about 30 cm. deep into the ground. The women dampens the kelp with shredded cedar-bark. The cross-piece with which the kelp is tied up is cut off, and the air is let out. The husband next places the kelp around the stake and pulls it back and forth over it until all the slat comes off and it is quite soft. Then it is folded up in four turns and tied in the middle with the thin end, and is thus ready for use.

When the kelp tube is torn, it is cut off straight at both ends near the cut, and a tube cut of elderberry-wood and called *ts!e'xmesala* (Fig.94) is inserted. The kelp is tied firmly around the tube with split kelp. The joint is rubbed with ashes, and it then covered with spruce-gum, which in its turn is covered with pulverized coal to make it smooth.

Funnels (*a'nalas*) for pouring oil into bottles are made of the head of a large kelp with a short piece of the stem attached. The upper part of the head is cut off, and the stem is inserted in the mouth of the bottle that is to be filled.

Kelp bottles provided with a mouthpiece of elderberry are also used for giving injections of salt water, catfish-oil, or dog-fish oil.

Household Utensils and Furnishings. Boxes, Baskets and Bottles

(p. 419 – 420)

Olachen-oil (*L!e'na*) *t'fina*, dogfish-oil (*xu'lq!wes*), and oil made of seal (*me'gwat!es*), porpoise (*Ko'lot!es*), whale (*gwe'gis*) and bear (*Le'ntses*), are also kept in kelp bottles. Catfish oil (*dze'k!wis*) is kept in small kelp bottles. The method of filling and keeping the kelp bottles may be described here. First a small amount of oil is poured

into the small end. This is pushed down between the fingers to the closed end of the bottle, and then it is pushed back again and poured out. This is to remove the peculiar taste of the kelp, and the bottle is cleaned out thoroughly in this manner. Generally the oil is poured in through a funnel (see p. 407), being dipped out of the kettle with a large clam shell, the contents of which are poured into the bottle by letting the oil run along the finger. In filling the bottle the oil is always pushed down to the closed end with the hand. The mouth of the bottle to be filled is held about a metre above the ground. The woman who fills the oil generally sits on a box. The bottles are kept in a box (q!a'lwas, "coiled into"), the bottom of which is covered with mats, and in the middle of the box a large clam-shell is placed. The kelp bottles are coiled up in the box, the mouth lying in the centre, just over the clam-shell; so that if they should leak, the oil would collect in the shell. A large box will hold as many as twelve bottles. The oil should keep sweet in the bottles; but if they are not carefully washed out, the oil will take the taste of the kelp. Then it is generally sold to other tribes who are short of oil.

When the oil-bottle is empty, it is heated over the fire, so that all the grease melts. Then it is pulled firmly over the edge of a small box, beginning at the closed end, and pressing it down against the edge with the palm of the hand. This is continued until all the oil is squeezed out (dena'). After this procedure, they are perfectly dry inside. They are folded again and put away in the dry box. When kelp bottles get moist, they begin to rot: therefore they are always kept near the fire.

Nets (p.465 – 470)

Nets are used particularly in fishing for olachen. I have described before the method of making the large olachen-net (ta'gał). This net is made of nettle-twine, and is conical in form. Its tip is open and about 30 cm. in diameter; while its mouth, when stretched out, is more than 2 meters in diameter. It has been stated that the thin or "tail end" of the net is made in a very small mesh, and that the sizes of the meshes increase towards the mouth of the net. The various parts of the net are called by the Indians "the mouth of the net" (a waxsta yasa ta'gałe); the third part, where the net becomes still narrower, "the knee of the net" (okwa'xa yasa ta'gałe); and the end, finally, "the tail of the net" (oxsda yasa ta'gałe). The mouth of the net is attached to a strong rope made either of cedar-withes or of cedar-bark. Five strand ropes of cedar-bark are used for this purpose. This rope is of the same length as the mouth of the net. It is spliced in the form of a ring. When the "mouth of the net" is to be hung to the rope, it is put up extended over the ends of two sticks which are driven into the ground, it is laced on with a netting-needle and heavy nettle-twine, being hung on with every second mesh. While the net is hanging this way, the net-rings (waswuk !a'lastsa ta'gałe, "ear-rings of the net") are attached to the rope forming the mouth, one at each pole along which the rope is extended. These rings (Fig.143) are made of cedar-branches about four spans long. Near the end of the branch a square notch is cut out, and a corresponding notch is cut on the other end, but on the opposite side of the branch. The branches are steamed, and a form is laid out on the floor of the house by means of strong stakes, which are driven deep into the ground. As soon as the branch is pliable, it is bent around this form, and the notches at the ends are hooked into each other. After the branches have cooled off, they are heated again over a fire and rubbed with

tallow. Then they are tied with cedar-withes and put back over the mould until they are quite cool. When the net is in use, the mouth is spread open by means of a pair of sticks with two notches. (Fig. 144), made of red pine, and about five spans long, which have been kept for some time over the fire until they have become quite sooty, so that they are waterproof.

Two other small nets are used in olachen-fishing. The first of these, called *xo'dayu*, has a square mouth. The net is made with very small meshes, and its standard measurements were given to me as four spans long and six spans around the mouth. In former times the handle of the net consisted of a hemlock-pole about two fathoms long. Near the end of it a notch was made, and a little over a span above this notch a second notch was made. Into these two notches fitted the two spreading-sticks of the net, which were at right angles to the handle, and which had corresponding notches. They were about half a fathom long, and were tied to the handle-pole at their middle, so that the handle-pole extended right across the centre of the net. The net itself was strung on a fairly strong rope, which was laced to the spreading stick, so that the sides of the net were held apart only by the rope on which it was strung. Since about 1860 a change in type of these nets has been made. Instead of the rather insecure attachment of the spreading-sticks to the handle, the spreading-sticks are placed between two curved poles (Fig. 145). About one span from the end these are slightly enlarged, and have a mortise into which the spreading-stick is inserted with a tenon. The net is attached to the spreading-stick and to the curved ends, while the lower end of the net is stretched only over the string to which it is attached. The curvature of the side-sticks, and the length of the net, are such that when the handle-ends are drawn together, the mouth of the net is very taut. The curved side-sticks are pointing at their ends, so that they can be pushed into the bed of the river, the net being extended along the bottom.

Another olachen-net is used without a handle-pole. It is called *p!e'gwayu* by the Kwakiutl, or *dex'we'layu* by the Nimpkish,

Mamaleleqala, *Lauitsis*, *Madi!be*, and *Qwe'qsot!enox*. This net also has meshes of small size, but is larger than the one just described. It is extended between two diverging poles, which are about three meters long and have forked points. About half a meter from the handle-end of these poles, notches are cut, over which a cross-pole about 60 cm. long is laid. It has notches about 40 cm. apart, corresponding to the notches in the net-holder. At these places are long net-holders and the cross sticks are firmly tied together with cedar-withes. Then the net is attached to the long net-poles, and the handle-end is drawn firmly together, by which means the mouth of the net is opened and fully extending. It is held at the cross-bar and at the end of the net-poles where they are tied together.

In olachen-fishing a combination of weirs and nets is used. In the river of Knight Inlet a long fence is built, extending from one bank down river at an angle of about 45° to beyond the middle of the river. Starting at the opposite bank, another fence is made running downstream, and also forming an angle of 45° with the bank. At the place where these two fences converge, an opening about two meters in width is left; and here four stout poles are driven into the river-bed, between which the canoe is fastened (Fig. 146).

A number of pairs of wing-dams are build in this manner, each pair belonging to one fisherman. These fences are made of hemlock, spruce, or alder trees, which are driven into the bed of the river and interwoven with wicker-work of hemlock and spruce branches. The stakes of the fence stand about one meter apart, and are about a meter an a half long. On top they are often held together by long poles which are tied on with ropes of cedar-withes. This fish-weir is used when the tide is running out strongly. The fisherman stands in the middle of his canoe at the outlet of the two converging wing-fences, holding the bag-net (p!e'gwayu), which has been described. The fish drift with the tide into the net, which is emptied every few minutes into the canoe. As soon as the tide begins to rise, the canoe is untied, and the fish are taken home.

Another kind of olachen-fishing is done with the large net (ta'gal). In fishing with this net, a place is selected where the falling tide runs very strong. The canoe is anchored or tied to a stake about ten fathoms above the place selected, and is allowed to drift down with the tide. Two net-posts are driven into the river-bed. These are generally driven two or three feet into the ground. The distance between the two net-posts equals the width of the mouth of the net. Then the rings of the net are put one on each post. The net is tied to the rings, and its mouth is spread with the spreading-sticks. Then the rings are pushed down under water with a long pole which has a hook and a notch at the lower end, and which serves both for pushing down the net and for lifting it. When the net is pushed down, its thin end is tied up with a strong rope. The strong tide takes the net down river, and the fish drift in towards the tail of the net. The fish are taken out in the following manner. The net is taken up with the hook about 15 meters from the tail-end, which is then lifted into the canoe. Then the end is untied, and the fish run out of the net into the canoe. Then the end is tied up again, and it is thrown into the water. Sometimes the fish are so plentiful that the mouth of the net has to be pulled up over water, or the spreading-sticks have to be taken out, because the fish run in so fast that they cannot be taken out quickly enough. If this is not done, the net-posts are liable to be torn out of the ground.