



CARCROSS/TAGISH TRADITIONAL KNOWLEDGE OF SALMON IN THE UPPER YUKON RIVER

ABSTRACT

The Carcross/Tagish traditional knowledge related to salmon includes stewardship and conservation; subsistence; community; impacts and mitigation.

Jennifer Herkes, MA
Ecofor Consulting Ltd

Executive Summary

Nine interviews were conducted with Knowledge Holders in Carcross using a questionnaire that focused on salmon in the Southern Lakes. The interviews were reviewed and analysed using thematic analysis.

The interviews with Knowledge Holders revealed four primary themes related to salmon in Carcross Tagish territory: Traditional and Cultural Knowledge of Salmon; Salmon as subsistence; Salmon as a driver for developing community; and negative impacts to salmon.

The Carcross Tagish people have a deep and broad knowledge of fishing and salmon. There is knowledge concerning the lifeways of salmon, their migration habits, as well as a knowledge of how the salmon can and should be preserved.

The importance of salmon as a subsistence resource was made clear during the interviews. Salmon was traditionally a very important food source and continues to be so today. People will make great efforts to obtain salmon for the winter including travelling far distances and negotiating trades.

The development of a sense of community, built on sharing, gathering, and interacting was an evident theme. The salmon were (and are) fished only one time per year, and in very specific locations. People establish fish camps, and specific fisheries become locations where people from various places come together with the same purpose. There is a sense that people shared their spaces as well as their resources as needed.

The Carcross Tagish have witnessed and experienced multiple changes and impacts to their territory since the first arrival of Europeans. The interviews provided information specifically concerning impacts to salmon in the territory. The results indicate that impacts to salmon are perceived to be caused by population increases, overfishing, and industrial developments.

Acknowledgements

Ecofor would like to thank the Carcross/Tagish First Nation for welcoming me into the community. Thank you to Tamara Grantham for initiating the research and helping to organize things in the community. I appreciate all of the Knowledge Holders taking the time to talk salmon with me. I know that you do not have to share your knowledge and I feel privileged that you did. Thank you to Frank, Charlie, and Tamara for taking me on a beautiful boat ride to Deep Bay.

Front page image: Nares Lake, photo by Jennifer Herkes

Photo Below: Our mode of transportation to Deep Bay.



Contents

- Executive Summary..... 1
- Acknowledgements..... 2
- Introduction 4
- Methods..... 4
 - Challenges 6
- Results..... 6
 - Traditional and cultural knowledge 6
 - Traditional Stories 6
 - Salmon life-cycle 9
 - Spawning and fishing locations..... 9
 - Stewardship and Conservation 11
- Subsistence 12
 - Food 12
 - Effort 13
 - Trade 13
- Community..... 13
 - Sharing 14
 - Fish Camps 14
 - Interaction..... 14
- Impacts..... 15
 - Population 15
 - Overfishing 15
 - Industrial Developments..... 16
- Recommendations 17
 - M’Clintock River 17
 - Whitehorse Rapids Fishway 17
 - Enhancement 18
- References Cited 19

Introduction

The Carcross Tagish people are descendants of the Tagish Kwan and the Inland Tlingit peoples. Their traditional territory encompasses the headwaters of the Yukon River. The source of the Yukon River is considered to be, “the Llewellyn Glacier at the southern end of Atlin Lake in British Columbia. Others suggest that the source is Lake Lindeman at the northern end of the Chilkoot Trail. Either way, Atlin Lake flows into Tagish Lake, as eventually does Lake Lindeman, after flowing into Lake Bennett. Tagish Lake then flows into Marsh Lake. The Yukon River proper starts at the northern end of Marsh Lake” (Yukoninfo 2015).

The Yukon River is an important salmon river with chinook, coho, and chum salmon swimming up its length to return to their spawning streams. The Yukon

River is over 3000 Km long and empties into the Bering Sea. The communities along the Yukon River have relied on salmon for cultural and subsistence needs since time immemorial.

As mentioned above, Carcross Tagish traditional territory encompasses the headwaters of this great river and therefore have strong ties to its watershed and resources. There are currently very few known salmon reaching the southern lakes of Tagish and Bennett. This project reviews traditional knowledge to understand this and gain a better understanding of salmon in the area.

The information may be used to inform future projects concerning the enhancement of salmon in the Yukon River.

This report begins with an explanation of the methods used in the project. This is followed by a section describing the results, and concludes with recommendations for further work.

Methods

A combination of ethnographic and historic research, combined with interviews of Knowledge Holders informed this project.

The existing historic and ethnographic information concerning the Carcross Tagish traditional territory and cultural practices was reviewed in terms of the association with salmon.

A questionnaire was developed to attempt to gather what traditional knowledge there is concerning salmon in the Southern Lakes area of Yukon as well as an understanding of traditional methods of conservation and stewardship. Questions were also included concerning the impacts to salmon. A series of maps of C/TFN territory were developed to help as a visual aide to compliment the questionnaire.

Knowledge Holders were determined with the help of a community liaison who could identify individuals who may have the most knowledge concerning salmon within a C/TFN context based on their length of residency, participation in community and cultural activities, and potential knowledge of salmon.

THIS is the headwaters of the Yukon River. This is why we are trying to keep it clean. The salmon, they come up the Yukon River and they do their spawning HERE.

Interview # 009

Eight in-person interviews were conducted with nine Knowledge Holders. An additional questionnaire was filled in electronically by a Knowledge Holder who was not available for an in-person interview. Interviews were recorded and transcribed where possible; written notes were taken during the interviews. Some recordings were of poor quality and could not be transcribed; the notes were relied upon heavily in these cases.

The researcher also spent a large amount of time in the C/TFN Government Offices participating in informal discussions with community members concerning fishing and salmon. Further, the researcher participated in a boat trip up the lakes to Deep Bay on Tagish Lake, where a net was set. There was also an opportunity to attend a community meeting concerning potential changes to the Yukon River watershed. Notes were taken of these interactions and their contents are included in the analysis.

Qualitative research aims to conduct data gathering until the researcher feels that no new data is being presented (Babbie 2004). In this case, the interviews were all very similar in the information that was provided and we are confident that a valid and valuable analysis can be made. Further interviews may increase the depth of knowledge, however, it is unlikely that new themes would be identified.

A thematic analysis of the interview transcripts and community notes was conducted in three steps: Key word identification, theme identification, sub-theme identification.

The first step was an initial read through of the transcripts and notes where a list of keywords were recorded, as well as a complete list of places that were mentioned in association with salmon fishing.

The second step included a review of the keywords to identify potential themes. A second read-through of the transcripts and notes further explored and identified potential themes. After this second read-through the list of themes was reviewed and overlapping themes were merged to identify the four (4) primary themes of the project: Traditional and cultural knowledge of salmon; salmon for subsistence; salmon’s role in interaction and community development; and impacts to salmon.

The third step of the analysis was to read through the transcripts and notes and record instances where the themes were present. This step resulted in the identification of sub-themes to the primary themes. The information was read through one time for each theme in order to identify any sub-themes related to that theme (Table 1). By doing it separately each time, it allowed for passages with potential overlapping themes to be identified and categorized to the multiple themes if necessary.

Table 1: Themes and Sub-Themes

Theme	Sub-theme
Traditional and cultural knowledge	Traditional stories Life-cycle Locations Stewardship and conservation
Subsistence	Food Effort Trade
Community	Sharing Camps Interaction
Impacts	Overfishing

	Increased populations Development (mines/dam)
--	--------------------------------------------------

The themes were then analysed in the context of the scientific, historic, and ethnographic information available. This analysis is presented in the following results section.

Challenges

The researcher found it challenging to organize interviews with C/TFN members. There were several other important meetings and activities happening in the community during the research visit. These meetings obscured some of the data that was received because Knowledge Holders were focused on the information being provided at these meetings. Answers to questions often reflected the concerns that were being addressed in the other meetings, rather than a focus primarily on salmon.

Furthermore, many of the Knowledge Holders participate in the community in multiple capacities, therefore, their time was limited and organizing interviews was a challenge. There are a number of Knowledge Holders who were suggested and we did not have the opportunity to interview them.

Another challenge that was faced was the use of maps. The actual geographic knowledge held by Knowledge Holders concerning spawning locations of salmon was not transferrable to the maps. Knowledge Holders could name locations, but few could specifically identify them on the maps. This could have been because the maps did not have enough detail, or were at an unacceptable resolution. None of the data collected from the maps was included in the analysis because it was not consistently provided during the interviews.

Results

The results of the analysis identified four primary themes: traditional and cultural knowledge, subsistence, community, and impacts. Each of these is presented in terms of their occurrence in the interviews and community observations as well as supported and contextualized with scientific, historic, and ethnographic information relative to the theme.

Traditional and cultural knowledge

It is important to note that centuries of contact and interaction with European influences has significantly altered the traditional subsistence lifestyle of the Carcross and Tagish people. Market economies removed people from their traditional camps and traplines which may have reduced and even removed Traditional Knowledge around historical salmon stocks south of the Tagish River. Nevertheless, the interviews indicated that there is a deep and broad knowledge of fishing among the Carcross Tagish. This knowledge included allusion to traditional stories explaining the lifeways of salmon, as well as knowing locations where salmon did and did not go, and how salmon stocks were preserved for future generations.

Traditional Stories

Traditional stories are important in an oral culture. First Nations have used oral communication of stories, lessons, and knowledge in order to maintain a historical record. Scholars have explained that, “oral traditions are the means by which knowledge is reproduced, preserved and conveyed from generation to generation. Oral traditions form the foundation of Aboriginal societies, connecting

speaker and listener in communal experience and uniting past and present in memory” (Hulan and Eigenbrod 2008: 7).

The people of the Carcross/Tagish First nation are descendants of the Tagish Kwan and the Inland Tlingit people. Tagish people intermarried with the Tlingit people and adopted many of their customs and language. As a result, the traditional stories of the Carcross/Tagish people reflect their past, and, while salmon may not have been abundant, to the inland Carcross/Tagish people at the headwaters of the Yukon River, the fish remains an important cultural symbol.

During one interview, a Knowledge Holder explained that, “Raven brought salmon, so he could have food. He dropped an egg at the head of every creek. The salmon return every year when Creek Mother sings her song” (Int#006). This anecdote illustrates the deep traditional knowledge and connection to salmon and an understanding of the lifecycle of salmon. Another example of a similar story is found in the CTFN Statute:

Afterwards he [Crow] came to a certain place and started to make a salmon creek. He said, “This woman shall be at the head of this creek.” The woman he spoke of had long teats, so he called her Woman-with-long-teats-floating-around, saying “When salmon come to the creeks, they shall all go up to see her.” That is why salmon run up creeks.

CTFN Statute Book One-Traditional Beliefs and Practices, Our Responsibilities. P.4

Another indicator of the cultural knowledge concerning salmon is found in C/TFN art. It was explained during the interviews that, “Salmon Trout Head is a design. It’s a filler. Just fills an ovoid. They say that the winter after fishing season you can tell how abundant the salmon were. If they used more Salmon Trout Heads in their designs that winter then they caught more salmon that summer” (Interview # 006). Some images of salmon in C/TFN art are presented below.

The presence of salmon in traditional stories and art is an indication of the importance of salmon in Carcross/Tagish culture. These stories and art are used to teach and share knowledge about the importance of salmon as a source of subsistence, places to find salmon, and an understanding of the salmon’s life-cycle. This information allows Carcross/Tagish people to better understand the environment and resources they are committed to protecting.



Top Image: Salmon carving by Keith Smarch, C/TFN member.

Bottom Image: Salmon Woman Mask carved by Keith Smarch, C/TFN member.

Salmon life-cycle

Salmon are an anadromous fish, meaning that they migrate from the sea into fresh water to spawn. Salmon eggs will develop through the winter and hatch in the late winter or early spring (YRP 2015b). According to the Yukon River Panel (2015b), “Most Yukon River Drainage Chinook salmon spend one to two years rearing in fresh water before their out-migration to the ocean....Chinook salmon from the Yukon River spend, on average, four years at sea (ranging between 1 and 6 years)”. Adult salmon will travel hundreds of kilometres to spawn in the same freshwater streams where they hatched. In the Yukon River, that means that salmon spawning near the headwaters, in C/TFN territory, may travel more than 3000 km in freshwater to reach their destination.

The interviews suggested that the Knowledge Holders have a clear understanding of the lifecycle of the salmon. One Knowledge Holder said, “The salmon is supposed to come back up to the river where their spawning territory” (Int# 009). There is a traditional and cultural knowledge that the spawning salmon are returning to the areas where they were hatched, and that the spawning will be the salmon’s final journey.

Lots of those salmon, their biggest intentions is to go back to where they were born but they don’t make it back there because of fishnets.

INT#009

One knowledge holder explained, “when the salmon turn red, they are eating their own, their body on the outside, it turns red, and then they get that green head. That is them consuming their body from the inside. They don’t eat; soon as they leave the ocean, they don’t eat. Their last journey is to lay their eggs and then they die” (int# 001). This is supported by scientific data; the Yukon River Panel

(2015b) explains, “Adult salmon going the furthest to spawn tend to possess the highest oil content of any salmon when they begin their upstream journey. Salmon do not feed during their spawning migration, so their condition deteriorates gradually during their migration as they use stored body reserves for energy.”

The Carcross/Tagish people have a clear understanding of the salmon, their behaviours, and life-cycle. This is knowledge that has been shared and passed on through generations. The information allows C/TFN people to be successful in fishing as well as be successful stewards of their land.

Spawning and fishing locations

Spawning locations for salmon at the headwaters of the Yukon River are historically unknown (Cox 1999). Furthermore, historic research by Cox (1999) indicates that there is mention in the 1880s that few salmon travelled further upstream than “Lake Marsh”. However, the development of the Whitehorse Rapids Dam affected the salmon migration and spawning patterns and locations of the salmon upstream from the dam. The Yukon River Panel has funded some projects researching spawning locations in some areas, but there is limited knowledge concerning the spawning locations in the upper Yukon River, particularly in C/TFN territory.

The interviews revealed that there is limited knowledge as to what previously constituted a good spawning location, and no Knowledge Holders could provide specific geographic locations of current spawning beds or streams. In terms of locations where salmon spawned in the southern lakes area, the overwhelming assertion was that salmon did not, and had never regularly, spawned in the southern lakes beyond Marsh Lake. There was no traditional knowledge of salmon in the southern lakes, no information that had been passed down orally through the generations. One respondent said, “I never heard anyone speaking about where salmon spawned near Atlin Lake, just at M’Clintock. People talked about where lake trout spawned, but not salmon, very rare” (Int#008). The most common location for C/TFN to have participated in salmon fisheries, as mentioned by the Knowledge Holders, was at M’Clintock River located at the north end of Marsh Lake, very near the northern extent of C/TFN territory. It was mentioned in seven of the interviews. Previous research has also identified the importance of M’Clintock (McClellan 2001, YRP 2003, deLaguna and McClellan 1978). The 2003 Yukon River Panel reported, “Traditionally, the M’Clintock area was vital to the Tagish Kwan people, as a reliable and accessible source of food, as a thoroughfare, and as a gathering place” (YRP 2003: 68). Watershed management research by the Kwanlin Dun First Nation (KDFN 2004) has focused on the M’Clintock watershed as, “the Chinook salmon of the M’Clintock River watershed have been a vital resource for many generations” (p. 4).

My mom stayed up there (Atlin) all their life. If they caught salmon they would have known. They never talked about it.

Int# 007

There are stories, known by most Knowledge Holders, about salmon that have been caught in the southern lakes area. It is not a common occurrence, and these salmon were most often described as “lost”. In 2014 the C/TFN Heritage, Lands, and Natural Resource department caught 2 salmon in Deep Bay. This is the furthest upstream record of Chinook salmon in the southern lakes (CTFN/Ecofor 2014). When asked about current salmon fishing in the southern lakes, one respondent said, “There is none whatsoever. The salmon have been caught, a few, but seem to have wandered astray. Got a couple last year way up in Deep Bay” (Int#007). Stories about salmon being caught in the southern lakes area were noted in 5 of the interviews, each of these examples was described as an oddity.

The lack of specific geographic knowledge of salmon spawning areas is interpreted as a consequence of the significant decreases in salmon stocks along the Yukon River, particularly upstream in C/TFN territory, as well as the geographic distance between the southern part of C/TFN territory and the more northern locations of salmon spawning habitat. Current Knowledge Holders were in their youth when the dam was built and many had not participated as adults in the salmon fisheries within C/TFN territory prior to the construction of the Whitehorse Rapid Dam. Furthermore, the geographic distance between the known fishing locations (M’Clintock River) and more southern C/TFN settlements would have created a barrier to knowledge as well. Some Knowledge Holders had lived in the southern parts of C/TFN territory and their families had not travelled to the north for their salmon fishing. For example, one Knowledge Holder said, “Well, I don’t know nothing about salmon. I was raised up at the end of Bennet Lake there. No recollection of salmon whatsoever there. I don’t remember grandma and grandpa ever mentioning salmon” (int#005). Another influencing component is language and place

names. Traditional knowledge may not have included specific place names, and furthermore, these place names may have been lost when Europeans arrived and applied their own names to places. Overall, there is a general traditional knowledge and understanding of where to get salmon based on shared stories and traditions, however, there is a lack of the intimate knowledge earned through active participation and experience.

Stewardship and Conservation

One of the most important parts of traditional knowledge is the understanding that there is an inherent responsibility to stewardship and conservation of the natural resources within First Nation territories. The Assembly of First Nations (AFN 2015) explains, “The traditional philosophy of First Nations is centered on the holistic view that everything is interconnected. First Nations recognize the link between

The fish are away from our influence now, but still our responsibility. Everyone thought all the salmon would last forever. You take only what you need, and use all you take. We were good stewards.

Int#007

the health of the environment and the health of their people. Many First Nations continue to assert that they have the responsibility to protect the environment for future generations”.

Salmon are and have always been very important to the Carcross/Tagish, as a food source, as a cultural icon, as a motivation for coming together, sharing, and trade. It is an important resource to preserve and protect so that it could provide for countless generations.

Every Knowledge Holder was asked how salmon were protected for future generations, and every Knowledge Holder responded that people only ever took what was needed and nothing was wasted. This is an important theme to note. The sense is that nature always provided enough, there was a balance, and now that balance has been broken. One Knowledge Holder explained, “We never wasted salmon like some people do now. People always shared. People only took what they need for food or trade. Now people catch fish and kill animals for fun. It was never like that for the First Nations, we only hunted and fished for food” (Int#008).

There are known ceremonies associated with salmon, and most are associated with a respect for the fish and its environment, as well as a conscious understanding of conservation. Erna Gunther (1926:614) explains, “The pattern for a salmon ceremony seems to be based on a reverential attitude toward the fish and a desire to treat it in such a manner that it will come in great numbers”. The spiritual connection to salmon is a clear indication of the importance of stewardship. It was described by a Knowledge Holder as, “They looked after it [salmon]. I think they used to talk to it. That is how well they respect every living species in this country” (int#009). The concept of ritual surrounding the fishing, including speaking with the salmon, singing, and praying was mentioned in a number of the interviews. One Knowledge Holder recounted a story of when they caught a salmon near Carcross, “we had a little salmon feast, it was a treat. It was an honour. That is how come my aunty wanted to go down and make an offering to the water. We were offering to the water and thanking the Creator for providing that salmon to come to us and hoping that salmon would continue” (Int#10).

The Carcross/Tagish First Nation have a traditional knowledge and understanding of the importance of salmon as a subsistence resource, and the connected importance to preserve and protect the salmon so that it may provide for future generations. There is an overall feeling that C/TFN have lost the ability to be proper stewards because of the cumulative impacts that the salmon have faced. C/TFN members were taught how to conserve salmon, and they are unable to apply their knowledge. Traditional knowledge instructs that you are only to take what is needed while allowing enough to survive so that future generations will have salmon available.

In 2015 there was a ban on commercial Chinook Fishing in the entire Yukon River drainage system, and regulations concerning Chinook bycatch have been imposed. It was mentioned in five interviews that various Yukon First Nations were not fishing Chinook this year, and had decreased their take in the past few years, because the numbers are so low (WHS 2015, JTC 2015). A CBC News (2015) report explains that the Tr'ondëk Hwëch'in intend to forgo Chinook fishing for up to 7 years to allow the Chinook an entire generation to replenish. One interview explains, "There is no fishing happening now. Sometimes in Teslin, but not this year" (Int#006). These measures of stopping the subsistence fishery are examples of applying traditional knowledge and understanding to the current salmon situation.

Subsistence

Subsistence was a primary theme when discussing salmon. The sub-themes that emerged included the importance of salmon as food,

Food

When asked about the importance of salmon to Carcross Tagish members, the answer was FOOD every time. One Knowledge Holder says, "The importance of salmon is because it's our food. You know, it's our food. I don't know how else to say that it is really important" (Int#003).

The interviews revealed that the tradition of getting salmon included 'putting up' the salmon. This process includes slicing the salmon flesh very thinly and then hanging the meat on racks while it is dried through smoke and wind. This was done to preserve the salmon and provide food for the winter. One knowledge Holder explains, "It don't matter how many native families went there (M'Clintock), there was more than enough salmon to provide for them. Some of them had dry salmon all winter from M'Clintock, in big caches. That's what they live on" (Int#009). Another illustrates how this activity was common all along the Yukon River, "They put up salmon...they have to put up their own salmon, all the way to Carmacks, all the way up, people put up salmon for the winter" (int#001). The importance of putting up salmon illustrates the integral role that salmon played in the subsistence of First Nations as a food source that would be preserved and eaten all winter while other food sources were unavailable.

Salmon was very, very important to the old people a long time ago. They depended on that salmon.

Int#004

Effort

The importance of salmon as a food staple is illustrated by the effort and distance that people would go to get salmon. When asked about where people would go to get salmon, or where salmon spawned, several places were suggested:

- Pine Creek
- Teslin Lake / Teslin River
- Atlin Lake
- Taku River
- M'Clintock River
- False Creek
- Little Salmon River
- Telegraph
- Tagish River
- Marsh Lake
- Pelly Lake
- Faro
- Carmacks
- Johnson's Crossing
- Squanga Lake
- Klukshu

Interestingly, these areas are located throughout the Yukon Territory and not necessarily within C/TFN territory, or even proximal to Carcross or Tagish (see Map 1). This indicates that salmon is an important food source because; while salmon may no longer be readily available to C/TFN members, there is an effort to obtain it. Trade was mentioned by several Knowledge Holders.

Trade

As mentioned above, traditional knowledge indicates that the C/TFN have only had access to salmon runs in the more northern part of their territory. The traditional knowledge indicates there was an active trade network that would allow for C/TFN members to get their salmon supplies. One Knowledge Holder explains. "As long as I have been living here, I have never heard nothing about salmon except going down to Pelly or Carmacks. My grandma used to get her salmon (from Carmacks), a little trade. I don't know what the deal was with them, but that was where grandma used to get her smoked salmon" (int#005). Each of the Knowledge Holders interviewed mentioned different means of how they obtain salmon: through family connections in the north or Alaska, or through trade or purchase from other First Nations. Salmon, therefore, not only plays an important role in subsistence, but also provided C/TFN with a connection to other First Nations in the area.

Community

Chinook salmon only run once a year, and, as mentioned previously, the salmon run that was the most productive for C/TFN was located at M'Clintock River, in the northern part of C/TFN territory. The seasonality, and singular location allowed for the salmon run to facilitate the coming together of many families and First Nations. The sub-themes that surround this include concepts of sharing, fish camps, and interaction with multiple groups.

Sharing

The concept of sharing was touched on in previous sections concerning trade and the idea that some people would rely on family groups in other areas to provide them with salmon, or at least, provide them with a place to go to catch salmon. Sharing of resources, as well as sharing of fish camps, was mentioned in 7 of the interviews. One interview explains, “My family, they go to Telegraph sometimes to get salmon. They have to go a long way to salmon. Their father is from Telegraph and he knows the people in the area there. That’s where they

There is a legend saying they used to fish, whole communities fished together and then they divided up the fish in the fall time.

Int#004

get their salmon from” (Int#004). During conversations at the government office, one youth expressed their concern about the decreased number of salmon, “one thing lost is the sharing. Salmon required sharing, it brought Carcross and Tagish together. When the salmon stopped, the sharing stopped” (Community meeting). The importance of sharing was also noted, in particular reference to elders.

Fish Camps

Most of the Knowledge Holders (7 interviews) emphasised the importance of fish camps; it was explained “we went out to the fish camp. The First Nations have their own camps along the river there, this is where they set their nets and put up fish” (int#003). Fish camps were family camps located in strategic areas associated with spawning salmon migration routes along the Yukon River. One interview response illustrates the importance of going to fish camp and being there in time to put up salmon, “my parents had their camp on that island across from the mouth of the M’Clintock River, and they named that island Mabel’s Island because I guess that is where my sister Mabel was born, at fish camp, at that time” (int#004). Gathering and putting up salmon was completely integrated into their lives. The journey to fish camp was so important that a very pregnant woman made the trek and had her children at fish camp. There were other mentions of people being born at fish camp, it was an important fact that people wanted to share.

The Carcross/Tagish people traditionally followed an annual cycle that followed the available resources. “Over the centuries, people followed an annual cycle, which took them to certain areas for fishing, hunting and berry picking. There was a constant and powerful connection to the land, which was seen as not something human beings own but simply what humans being cared for” (Jensen 2005: 3).

Interaction

There are also several examples of C/TFN members joining other families at their fish camps, and a recognition that the salmon run brought many families and groups together; this was mentioned in every interview. One Knowledge Holder explained, “They set up fish camps (at M’Clintock), six families or more, and other groups too. Carcross and other groups, mostly Tlingit and people from Kwanlin Dun” (int#007).

Potlatches are an important ceremony in C/TFN society. “A potlatch celebrated life, death and other momentous occasions. It was at the centre of the community and brought people from other villages closer together” (Jensen 2005:5).

Impacts

All nine of the Knowledge Holders commented on the decreased numbers of salmon available, specifically at M'Clintock, but decreases were noted for the entire Yukon River watershed. Every interview and casual conversation noted that there were decreases in salmon. During a community meeting, when the salmon project was described, the response was, "What salmon?" (Int# MW). These decreases are devastating as salmon is an important food source, but also, because of the C/TFN role as stewards. One elder explained that stewardship meant having salmon for future generations, "That's future generations, for their grandchildren. WE are the grandchildren and we got no salmon. Where's the salmon that our ancestors have been saving for their grandchildren" (int#009).

The Yukon River has experienced numerous impacts since the Gold Rush in 1896, this section will focus on the impacts that were raised as concerns during the interviews: population impacts, overfishing, and industrial development (mines and dams).

Population

Increased human populations was an impact that was raised in four interviews. One respondent felt that the salmon numbers began to decrease as the population in Whitehorse increased.

Human activity that is why everything is getting weak. Anything human activity. Humans got something to do with it, it's always going down the drain, its no good.

Int#009

Pollution was a concern to some of the respondents, with an emphasis on the necessity of keeping the headwaters of the Yukon River clean. During casual conversations many elders lamented about the fact that they had to drink bottled water, rather than the water that nature provides because of pollution.

Overfishing

According to the Yukon River Panel (YRP 2015a), the average number of Chinook salmon that are caught in the Yukon River is 135,925, and approximately 25% of that catch is within commercial fisheries. The Yukon River flows through both Alaska and Yukon, and is, therefore, used by both Canadians and Americans, and managed by both governments. There are First Nation (subsistence) fisheries, commercial fisheries, sport/recreational fisheries, and domestic (personal-use) fisheries on each side of the border (*Ibid*). One person said, "You protect something all of your life, and then someone comes in and profits from it and doesn't follow traditional ways" (Community meeting).

Overfishing may be correlated with population increases and was mentioned in six of the interviews. It stands to reason, that with an increase in population, there will be an increase in the fisheries along the Yukon River and result in a decrease of the salmon stocks available. Furthermore, there is concern that Chinook are victims of bycatch (fish caught accidentally while trawling for other species).

The Joint Technical Committee of the Yukon River provides escapement estimates of the number of Chinook that have escaped both the commercial and subsistence fisheries. Their findings show that

since 2005, the escapement had decreased by more than 50% in 2013 (Table 2), with a substantial increase in 2014, which is attributed to commercial and subsistence fisheries closures (JTC 2015).

Table 2 Mainstream Yukon River Escapement Estimates

Year	Mainstream escapement estimate
2005	67,985
2006	62,630
2007	34,904
2008	33,883
2009	65,278
2010	32,014
2011	46,307
2012	32,656
2013	28,669
2014	63,331

(derived from JTC 2015:36)

Industrial Developments

Industrial developments were considered responsible for decreased salmon stocks in all of the interviews. Dams were the primary concern, and noted by everyone, but mining developments, as well as the highway and railway construction were blamed for increased pollution in the watershed.

The Whitehorse rapids dam was mentioned in all of the interviews. Construction of the Whitehorse rapids dam started in 1956 and was completed in 1958, a two year period when salmon migration was completely blocked (KDFN 2004). Since then, the dam has had turbines added and a hatchery built to help mitigate the impacts and losses to Chinook salmon populations. A fish ladder was built in 1959 to help spawning Chinook migrate past the dam.

But them times there used to be no dam there or nothing, just lots of salmon. All kinds of salmon. Millions of them.

Int#009

According to Yukon Energy (n.d:6), “a number of structures were designed to ensure that the salmon could bypass the dam and reach spawning grounds upstream. Special underwater screens were installed to stop the fish from swimming into the turbines. A concrete dam or weir was built to help direct the fish toward the fishway. An underwater canal was added to help the salmon find their way, and the fish ladder was constructed. At 366 metres it is considered to be the longest wooden fish ladder in the world.”

Data concerning the number of salmon passing through the fishway has been gathered since 1961 (JTC 2015: Appendix B12). The highest recorded count was in 1996 with 2,958 salmon counted at the fishway. The average number of Chinook to be counted is 941, with the lowest count being 121 Chinook in 1976 (Table 3). There are no counts that were done prior to the development of the dam, so we must

rely on traditional knowledge. Many of the Knowledge Holders shared stories about the large number and size of salmon available in the past. One Knowledge Holder describes the salmon along the Yukon River, “They were just like herrings, the salmon going up the river, just schools of them. And now I go back there I hardly see any salmon like I was looking at 50 years ago” (Int#009).

Table 3 Average Chinook escapement counts at Whitehorse Fishway

Years	Average count at Whitehorse Fishway
1961-2013	941
2004-2013	1237
2009-2013	1041
Minimum (as of 2013)	121
Maximum (as of 2013)	2958

(Derived from JTC 2015: Appendix B12)

Concerns related directly to salmon were correlated to the concept that the fish ladder was hindering the number of salmon from returning to their place of origin to spawn, as well as a perception that very few salmon fry actually survived the downstream journey over the dam. The concern of the dam being an insurmountable obstacle for the salmon was mentioned in every interview. One Knowledge Holder explained, “I think there is hardly any [salmon] that come up now. Because the big salmon, they come up the fish ladder, but when the little ones go down, they get stuck in the turbine or something, that’s what I heard, so they never make it back up the river, so we are getting less and less salmon all the time” (int#004). In the 2003 McIntock River Watershed Salmon Management Plan (YRP 2003:60), it was noted that there are two dams in C/TFN territory (Whitehorse Rapids, and Lewes River Dam), and that they are the only dams along the entire Yukon river which must be navigated by salmon; it is hard to ignore the inevitable impact of such obstacles.

Recommendations

The research has provided a clearer understanding of the traditional knowledge of salmon within the Southern Lakes. It has also presented a number of further questions and opportunities for further research. The following is a list of recommendations for further research to better support and increase the Chinook salmon populations in the headwaters of the Yukon River.

M’Clintock River

M’Clintock River was mentioned throughout the interviews as a very important location for salmon fishing among the Carcross Tagish. There has been research and work concerning the rehabilitation for salmon habitat at M’Clintock. As mentioned above the Kwanlin Dun First Nation have been researching this area from a planning perspective with the goal of being able to set up fish camps and harvest Chinook salmon once again (KDFN 2004). It is recommended that this research continue and be collaborated and supported by C/TFN. If runs in M’Clintock can be restored to the plentiful salmon runs of the past, this will provide opportunities for C/TFN to work with neighbouring First Nations to re-establish fish camps, and nurture the culture of community and sharing that was discussed above.

Whitehorse Rapids Fishway

The Fishway is a major source of concern among the Knowledge Holders concerning the salmon in the region. It is recommended that C/TFN work with Yukon Energy to gain a clearer understanding of the processes that are put in place to help encourage the salmon to swim up river, as well as successful

travel downstream by the fingerlings. There seems to be a generally negative perception of what happens to the fish at the fishway; there needs to be more information sharing regarding how the fish ladder works and how the fingerlings are protected.

Furthermore, it is recommended that other methods and options to facilitate the salmon passage past the dam (in both directions) be researched. Current and modern research about fish passage may help to provide new innovative approaches to increase successful fish passage.

Based on the numbers provided in this report, there are several hundred to over a thousand fish annually passing through the fishway. However, knowledge as to where these salmon are going and spawning is limited. It is recommended to engage in further research of tracing where the fish are spawning, other than at the known sites of M'Clintock River, Mitchie Creek and a few minor streams. This information can help to inform other efforts in habitat restoration.

Enhancement

The research revealed the importance of salmon to C/TFN. It is recommended to conduct a feasibility study regarding salmon stocking/enhancement further south in the Southern Lakes. While traditionally there were no regular salmon runs in the area, there is a potential that environmental and climate change may have created a more suitable habitat in the headwaters of the Yukon River. This study should include research into how the community would feel about this type of enhancement, as it is the development of salmon habitat, rather than restoration.

References Cited

- Assembly of First Nations (AFN). 2015. Environmental Stewardship. <http://www.afn.ca/en/policy-areas/environmental-stewardship> (accessed October 2015).
- Babbie, E. 2004. *The Practice of Social Research 10th edition*. Wadsworth: California.
- Carcross/Tagish First Nation. N.D. *CTFN Statute Book One: Traditional Beliefs and Practices-Our Place, Our Responsibilities*. http://www.ctfn.ca/documents/doc_view/80-book-one-doc (accessed October 2015).
- Carcross/Tagish First Nation and Ecofor Consulting. 2014. Tagish Lake Salmon. Yukon Salmon Steering Committee Publications. <http://yssc.ca/assets/documents/workshop-2014-tagish.pdf> (accessed October 2015).
- CBCnews. 2015, July 19. Tr'ondëk Hwëch'in First Nation uses frozen salmon at youth fish camp. <http://www.cbc.ca/news/canada/north/tr-ond%C3%ABk-hw%C3%ABch-in-first-nation-uses-frozen-salmon-at-youth-fish-camp-1.3158513?cmp=rss> (accessed October 2015).
- Cox, J. 1999. Salmon in the Yukon River Basin, Canada: A compilation of Historical Records and Written Narratives. Yukon River Salmon Restoration and Enhancement Fund CRE-17-98.
- de Laguna, F. and C. McClellan. 1978. Tagish. In: *Volume 6 of Handbook of North American Indians: Subarctic* (edited by W.C. Sturtevant). Government Printing Office: Ottawa.
- Gunther, Erna. 1926. An Analysis of the First Salmon Ceremony. *American Anthropologist* n.s. (28): 605-617.
- Hulan, R. and R. Eigenbrod (eds). 2008. *Aboriginal Oral Traditions: Theory, Practice, Ethics*. Fernwood Publishing: Halifax.
- Joint Technical Committee of the Yukon River US/Canada Panel (JTC). 2015. *Yukon River Salmon 2014 season summary and 2015 season outlook*. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A15-01, Anchorage.
- Jensen, M. 2014. Tagish Lake Salmon. <http://yssc.ca/assets/documents/workshop-2014-tagish.pdf> (accessed October 2015). Carcross/Tagish First Nation Ratification Committee: Carcross.
- Jensen, M. 2005. *Our Story: A historical reflection of the Carcross/Tagish First Nation's Land Claims Process*. http://www.ctfn.ca/documents/doc_view/4-land-claims-history (accessed October 2015).
- Kwanlin Dun First Nation (KDFN). 2004. Géis Too'e': King Salmon River M'Clintock River Watershed Management Planning and Michie Creek Chinnok Salmon Field Investigations 2003. Yukon River Panel Restoration and Enhancement Fund RE-50-03.
- McClellan, C. 2001. *My Old People Say: An Ethnographic Survey of Southern Yukon Territory, Part 1*. Canadian Museum of Civilization: Ottawa.
- Whitehorse Star (WHS). 2015, July 13. Tighter Chinook Conservation announced by minister. <http://www.whitehorsestar.com/News/tighter-chinook-conservation-announced-by-minister> (accessed October 2015).

Yukoninfo. 2015. Yukon River. <http://www.yukoninfo.com/yukon-river/> (accessed September 2015).

Yukon Energy. N.D. Whitehorse Rapids Fish Ladder and Hatchery. https://yukonenergy.ca/media/site_documents/491_fish_ladder_eng.pdf (accessed October 2015).

Yukon River Panel (YRP). 2003. McClintock River Watershed Management Plan Part ii. <http://yukonriverpanel.com/salmon/wp-content/uploads/2010/06/cre-50-03-mcclintock-river-watershed-sal-manag-plan-part-ii.pdf> (accessed September 2015).

Yukon River Panel (YRP). 2015a. Yukon River Salmon Fisheries Harvest Information. <http://yukonriverpanel.com/salmon/fisheries-menagement/yukon-river-salmon-fisheries-harvest/> (accessed October 2015).

_____. 2015b. Yukon River Salmon. <http://yukonriverpanel.com/salmon/about/yukon-river-salmon/> (accessed October 2015).