Oral Histories and Alpine Archaeology in T'aaku Kwáan Territory

by

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Abstract

This community-based research project demonstrates how the alpine landscapes of Lingit Aaní (northwest British Columbia and southeast Alaska) have been shaped by Lingít oral histories. Decades of ice patch archaeology in the southern Yukon have revealed a highly developed ice patch hunting tradition among Subarctic Indigenous people. Yet, other than opportunistic discoveries such as the Kwäday dän Ts'ínch (The Long-Ago Person Found), there have been few systematic efforts made toward understanding Indigenous land use in alpine landscapes in adjacent northwestern British Columbia (Greer et al. 2017). This research project is an effort to map many of the cultural landscapes located in the alpine, in the traditional territory of the T'aaku Kwáan, now represented administratively by the Taku River Tlingit First Nation (TRTFN), based out of Atlin, B.C. Published oral histories from Lingít oral historians Jackie Williams (Yáx góos) and his mother, Elizabeth Nyman (Sédayá) of the Yanyeidí clan shape the interpretations of alpine land use presented in this thesis. There are many descriptive accounts of alpine land use in the oral histories of the T'aaku Kwáan, as well as detailed knowledge encoded in Lingít toponyms. This research project will examine the cultural role of alpine use areas and will serve as an archaeological baseline in this region, which has been subject to scant research. This thesis will examine the above noted research to help determine the cultural role of alpine use areas within T'aaku Kwáan territory for the purpose of creating an archaeological and cultural heritage baseline from which future research can build.

This research study explores the history of T'aaku Kwáan territory (as defined by Elders and knowledge keepers) through an integrated approach that combines archaeological evidence, oral histories, and cultural toponyms. The investigation examines the alignment between these

sources of knowledge and their implications for understanding the region's history. The findings highlight the dynamic nature of T'aaku Kwáan society and the durability of oral knowledge more broadly and call into question the overall lack of engagement with oral histories in the vast majority of professional archaeology consulting in British Columbia, Canada. Drawing upon the oral traditions passed down by Taku River Tlingit elders and recorded by dedicated individuals, the research investigates the close correlation between oral histories, Lingít toponyms, and archaeological sites. My research will add to the growing body of literature that recognizes the crucial role of oral histories in the field of archaeology. The alignment between these sources of knowledge underscores the reliability and historical value of oral knowledge.

Preface

Parts of this thesis have been previously published on the British Columbia Remote Access to Archaeology Data (RAAD) website. This suite of research was carried out under British Columbia Heritage Conservation Act Investigation Permit 2021-0278. Jennifer Herkes of Two Crow Consulting was the permit holder for a tripartite alpine and ice patch archaeology project between Taku River Tlingit First Nation, Carcross Tagish First Nation, and Teslin Tlingit Council. The title of our joint report to the British Columbia Archaeology Branch is: "Archaeological Investigation of Archaeological Sites within Ice Patches Located in Northern British Columbia within the Traditional Territories of the Carcross/Tagish First Nation, Taku River Tlingit First Nation, and Teslin Tlingit Council," which was submitted for approval on September 1, 2023 (Herkes et al. 2023).

The thesis sections titled "pXRF Methods" and "pXRF Results" were written by Dr. Rhy McMillan and are included in this thesis on pages 85-89. All other thesis chapters not mentioned here are my original research.

Archaeologist Blake Evans of Wolf and Crow Consulting and I led the Taku River Tlingit alpine ice patch investigation, with support from citizens, elders, and youth from the community. Blake Evans and I both acted as Field Supervisors, and we shared the responsibility of site identification, note taking, artifact analysis, site mapping, and reporting to the Archaeology Branch. We co-authored TRTFN's report under permit 2021-0278. Blake Evans and I worked collaboratively to record sites IhUm-07, IkUh-02, IgUf-6 and IiUn-5. I recorded sites IiUj-01 (site update), IiUj-15, IiUi-2, IjUj-27, and IkUg-3 independently.

Although we shared a permit with Carcross Tagish First Nation (CTFN) and Teslin Tlingit Council (TTC), each Nation completed their research program completely independently of each other. The findings of CTFN and TTC are not discussed in this thesis, and the sites are entirely different. For more information on the findings made by Carcross Tagish First Nation and Teslin Tlingit Council, please see the report mentioned above. This report is on file with the British Columbia Archaeology Branch.

This thesis received ethics approval from the University of Alberta Ethics Board. The working title was “The Cultural Landscape of Alpine Sites in Łingít Aaní.” Ethics approval #Pro00125486 was granted on January 11, 2023.

Dedication

"People need stories to tell, as truly as they need shoes, knives, and fire. We need them because stories are maps of the world; they are concentrated summaries of reality. People who have no stories to tell, like stories that have no people to tell them, don't survive."

- *Robert Bringhurst*

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- SKIPP Situated Knowledges: Indigenous Peoples and Place
- UAlberta North
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The trt.geolive.ca website, which formed an integral part of this study, was created by Taku River Tlingit citizens, such as Alice Carlick, Keith Carlick, Terry Jack, Nicole Gordon, Louise Gordon, Wayne Carlick, Ed Anderson, Susan Carlick, Bryan Jack, Vivian Mahoney, Andrew Williams, Jackie Williams, Mary Anderson, Antonia Jack, and many others (Taku River Tlingit First Nation 2013). Technical support from Dr. Christine Schreyer, Nick Blackwell, Mark Connor, Jon Corbett, Tara Grant, David Lacho, Colleen Larson, Emily Millard, Anna Schmidt and collectively facilitated the creation of the digital platform.

A special thank you to my supervisors, Dr. Maggie Spivey-Faulkner and Dr. Andre Costopoulos, and my committee members, Tamis Cochrane, Dr. Andie Palmer and Dr. Lesley Harrington.

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Introduction

In the subarctic region of North America, the land borders of the Yukon, British Columbia, and Alaska all converge. Lingít peoples refer to this territory as Lingít Aaní and have done so for thousands of years. This is the traditional territory of the T'aaku Kwáan, the People of the Taku River (Nyman et al. 1993; Thornton 2012; Williams 2006). Áa Tlein (Atlin Lake) is the origin point of the mighty Yukon River, which stretches 3,190km to the Bering Sea. Today, the town of Atlin, British Columbia, is where many Taku River Tlingit people live. Atlin is about 90 km south of the Yukon border and 90 km east of Juneau, Alaska. The Gold Rush town of Atlin was built in the same location as the Lingít settlement of Wéinaa (Alkali Place). The T'aakú Héeni (Taku River) is the focal point of the territory. It carries thousands of salmon from the west coast to the interior, cutting through the precipitous Boundary Range mountains. Just a few generations ago, there were large Lingít villages at nearly every confluence along the river, stretching from tidewater to the arid interior plateau. Although largely depopulated now as a result of colonial pressures, many Lingít families continue to maintain camps in the exact same locations on the banks of the Taku as their ancestors before them. This area is a land of boundaries - it straddles the coastal interior climate divide and also encompasses the headwaters of two vast watersheds, the Taku River and the Yukon River. And yet, these boundary zones continue to provide cultural meeting places as well. This is where Lingít and Athpascan societies have met, and continue to meet, sharing aspects of their cultures, trading, marrying, feuding, as families will do, since time out of mind.

To begin, I would like to introduce myself, so as to situate myself in relation to this work. I am a descendant of European refugees. Both my paternal and my maternal great-grandparents fled Europe during the violence of the Second World War, with their sights set on Canada. I grew up in another area of Indigenous boundaries of the territories of the Wei Wai Kai and the Wei Wai Kum of the Kwakwaka'wakw and the Komox-Pentlatch Coastal Salishan on Quadra Island and northern Vancouver Island. I completed my undergraduate degree at the University of Victoria, and shortly after graduating, I decided to move north.

For the past five years I have worked with the Taku River Tlingit First Nation (TRTFN) in the village of Atlin, BC. My initial role was to organize the community archives. I began the process

of digitizing hundreds of cassette tapes, VHS, hi 8's and other forms of analog media, with the goal of making these records more accessible to the community. Many of these audio recordings and transcriptions contained the oral histories of Lingít elders who have since passed.

Slowly, I began to learn about the history of the Taku region through the works of oral historians who transcribed their words to preserve their knowledge in text, albeit in a slightly altered form. My eyes were opened to the rich and detailed oral histories, which present information that is absent in any European history or ethnography. Before long, I was tasked with re-assessing much of the archaeology work that was completed in the early 1970's, prior to the advent of GPS or any modern methods. Alongside this work, I was also exposed to the Cultural Resource Management industry peripherally, as there have been consistent requests by various proponents to conduct work on the TRTFN traditional territories.

This led me to scrutinize the Heritage Conservation Act (HCA), which is the piece of provincial legislation that governs all archaeology sites in BC. What I found in this document disturbed me in many ways. First, I discovered that there is an assumption of Canadian state sovereignty over all Indigenous artifacts. An archaeology site is defined in the HCA as "a site that contains artifacts, features, materials or other physical evidence of human habitation or use before 1846" (Province of British Columbia 2022). The Oregon Boundary Treaty, which established a border between Britain and the United States at the 49th parallel, was signed in 1846 (Sage 1946). The treaty was codified into law in Europe, but none of the Indigenous tribes whose territories were impacted were aware of, much less participating in, the treaty process, despite the fact that it would have a permanent influence on their right to their lands and even their lives. Colonial history would repeat itself in 1903 when an international tribunal decided on the international boundary that would sever Southeast Alaska from Northwestern British Columbia.

Traces of European material culture prior to 1846 are ephemeral, and the vast majority of archaeological sites in B.C. (well into the 90th percentile) are Indigenous. The effects of this attitude of colonial sovereignty over Indigenous artifacts culminate in the further dispossession of Indigenous material culture from descendant communities. I observed Indigenous artifacts being dug out of the ground and shipped to designated repositories thousands of kilometres away

from the Indigenous communities who have ancestral ties to these objects and the territories from which they derive their significance. While I could still see the value of archaeology, the obstructions that effectively prevented remote Indigenous communities from engaging with the material culture of their ancestors loomed large. While there have certainly been academic partnerships between First Nation communities and archaeologists in B.C. , which have produced mutually beneficial outcomes, unfortunately, this represents a small fraction of the archaeology that is completed in the province. It remains to be seen how legislation such as DRIPA[1] will change the landscape of archaeology in favour of descendant communities.

When I attended the Haines Junction Mountain Festival in 2019, I witnessed a different model of archaeological practice - one that appeared to consider the goals of Indigenous communities. Christian Thomas, an archaeologist who worked for the Yukon Government at the time, gave an excellent presentation on the ice patch archaeology that he was coordinating in partnership with six Yukon First Nations: Carcross/Tagish First Nation, Kwanlin Dün First Nation, Kluane First Nation, Champagne and Aishihik First Nation, Teslin Tlingit Council and Ta'an Kwäch'än Council. These communities had a seat at the table when it came to both the fieldwork and the interpretation of the results. During the presentation, I learned that due to the unique taphonomic conditions of ice patches, organic cultural materials constructed of wood, bone or leather could be preserved for thousands of years, in stark contrast to the short lifespan of organic materials in acidic subarctic soils. Although there is a great deal of geographic and climatological similarities, because the majority of Taku River Tlingit First Nation's (TRTFN) traditional territories are in British Columbia, they were effectively excluded from the research that had been ongoing in the Yukon for over 20 years. 11 of the 15 First Nations with territory in the Yukon have signed Umbrella Final Agreements with Canada. The 59th parallel was designated as the northern limit of British Columbia's province in the 1871 Terms of Union with Canada. Due to the Klondike Gold Rush, the Canadian government hurriedly created the Yukon Territory in 1898, dividing it from the existing Canadian Northwest Territories and establishing its

[1] "The Declaration on the Rights of Indigenous Peoples Act (Declaration Act) establishes the United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration) as the Province's framework for reconciliation, as called for by the Truth and Reconciliation Commission's Calls to Action." https://www2.gov.bc.ca/gov/content/governments/indigenous-people/new-relationship/united-nations-declaration-on-the-rights-of-indigenous-peoples

southern boundary at the 59th parallel. The indigenous communities on both sides of the boundary would continue to be impacted by this additional layer of differential authority. And once more, none of the Indigenous populations that would be harmed were represented on the commission that resulted in the creation of the Yukon.

Prior to beginning this project, I found evidence of very few ice patch archaeology projects in British Columbia. One notable exception is Duncan McClaren and Brendan Gray's project on Mount Edziza, in partnership with the Tahltan Central Government (McClaren and Gray 2020). Being familiar with the sparse archaeological record in northern BC, as well as the detailed oral histories of the T'aaku Kwáan, I saw an opportunity to begin mapping some of the cultural landscapes whose attributes and cultural significance have been passed down through generations of oral record keeping. It is important to keep in mind that much of the mapping of cultural sites had already been completed. The Taku River Tlingit community built an interactive map (trt.geolive.ca) that includes many Lingít placenames, pronunciations, and some of the oral histories that go along with them (Taku River Tlingit First Nation 2013). It was apparent that alpine landscapes are an integral part of the territory, from the rolling mountains filled with caribou in the interior, to the glaciated peaks of the Boundary Range that acted as passageways to Alaska. My goal was to highlight the gap that existed between the historical record, which has been captured in Lingít toponyms and oral histories, and the archaeological record in the alpine.

After bringing this idea forward to the elders and leaders in the Taku River Tlingit community, they were supportive and encouraged me to proceed. A Memorandum of Understanding was signed between Carcross Tagish First Nation, Teslin Tlingit Council and Taku River Tlingit First Nation, as all three communities expressed an interest in exploring their ancestral ties to alpine sites in northern British Columbia. Representatives from each Nation planned and executed research in the study area independently, engaging with relevant knowledge that is specific to each community. The archaeological sites discussed in this thesis were those that the TRTFN field crew recorded during the summer of 2022. Additional sites were recorded in 2021 however due to scope limitations, they are not discussed in this thesis.

Oral histories offer up an epistemological frame for engaging with the past that must be considered with the same seriousness as written textual records (Echo-Hawk 2000; Martindale

2006; Miller 2011). These ideas will be discussed at length later in this thesis. This research project primarily engages with the published oral histories of two Taku River Tlingit elders of the Yanyeidí clan, Jackie Williams (Yáx góos) and his mother, Elizabeth Nyman (Sédayá), although others are referenced sporadically.

Rather than attempting to critically scrutinize the accuracy and legitimacy of oral histories, this investigation takes a stance in which these accounts are taken at face value. They are presented as historical narratives of use and occupation. My research objective is not to subject oral histories to methodological tests with the goal of empirically quantifying their accuracy using archaeological techniques. Conversely, this study acknowledges T'aaku Kwáan oral histories as a robust information source; the information contained within them informs and shapes this archaeological study and interpretation. My research engages with oral histories and combined with a research epistemology that includes empirical methodologies, will answer the following research questions:

- What are the ethical implications of neglecting Taku River Tlingit oral histories in the process of constructing archaeological sites, and how can these be addressed through policy or praxis changes?
- To what extent do Taku River Tlingit oral histories align with the archaeological record, and what implications does this have for understanding the region's history?
- What challenges or limitations exist in using Taku River Tlingit oral histories to inform archaeological research and site preservation, and how can these be addressed?

Background

Regional background

The study area (fig. 1) falls within the Boreal and Taiga Cordillera ecoregion. The Ecological Framework of Canada identifies 15 discrete ecologically distinct regions across the country (Mahdianpari et al. 2020). The region is situated east of the Coast and Boundary Ranges, and south of the Mackenzie Mountains. Typically, winters are long, and the cold can be severe, while

summers are short and temperate with long daylight hours (Mahdianpari et al. 2020). Precipitation is relatively consistent between seasons. Mountains farther to the west, and nearer to the Coast and Boundary Ranges, receive more precipitation than those farther east (Demarchi 2011).

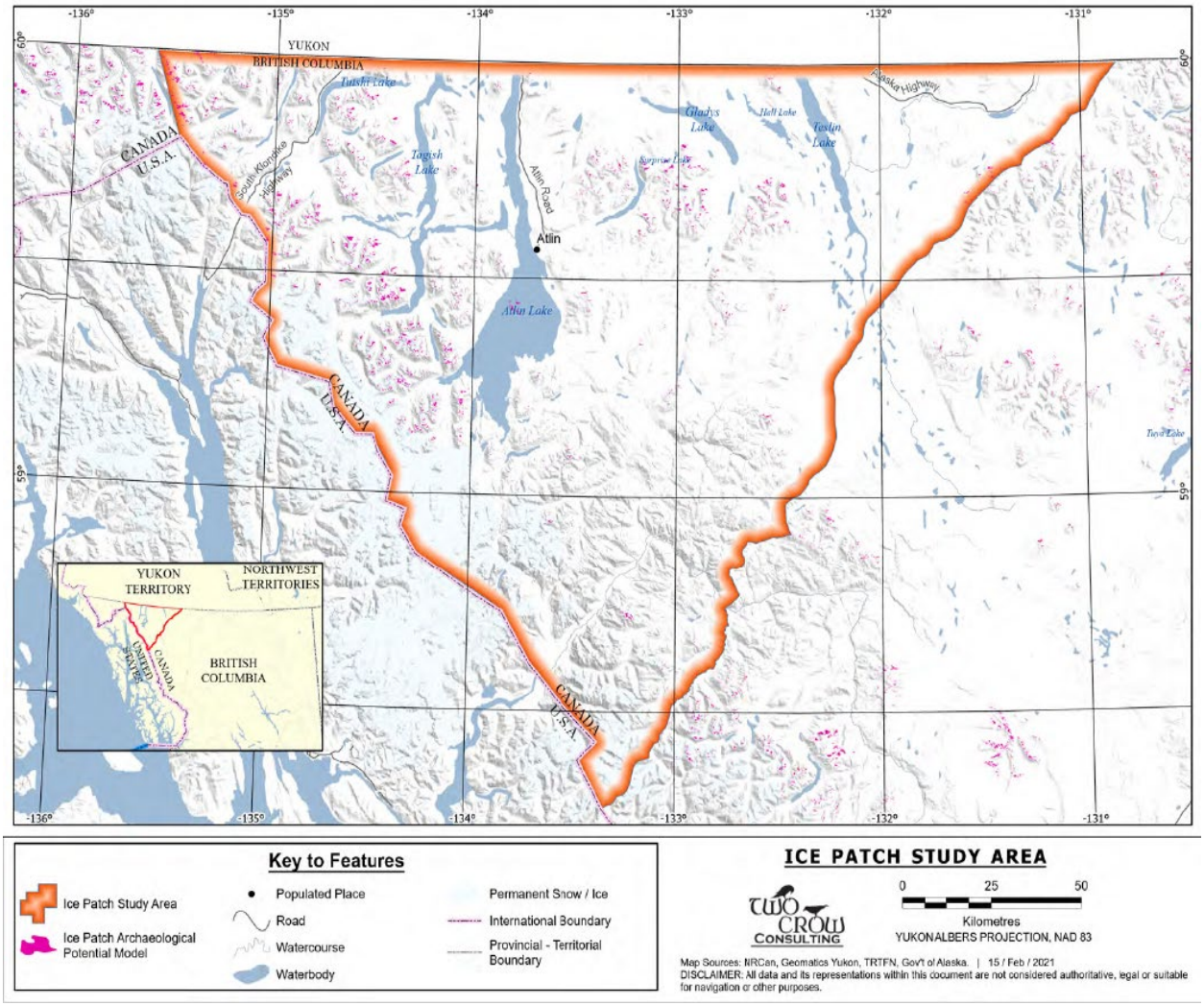

Fig. 1. Ice patch and alpine study area (Herkes et al. 2023)

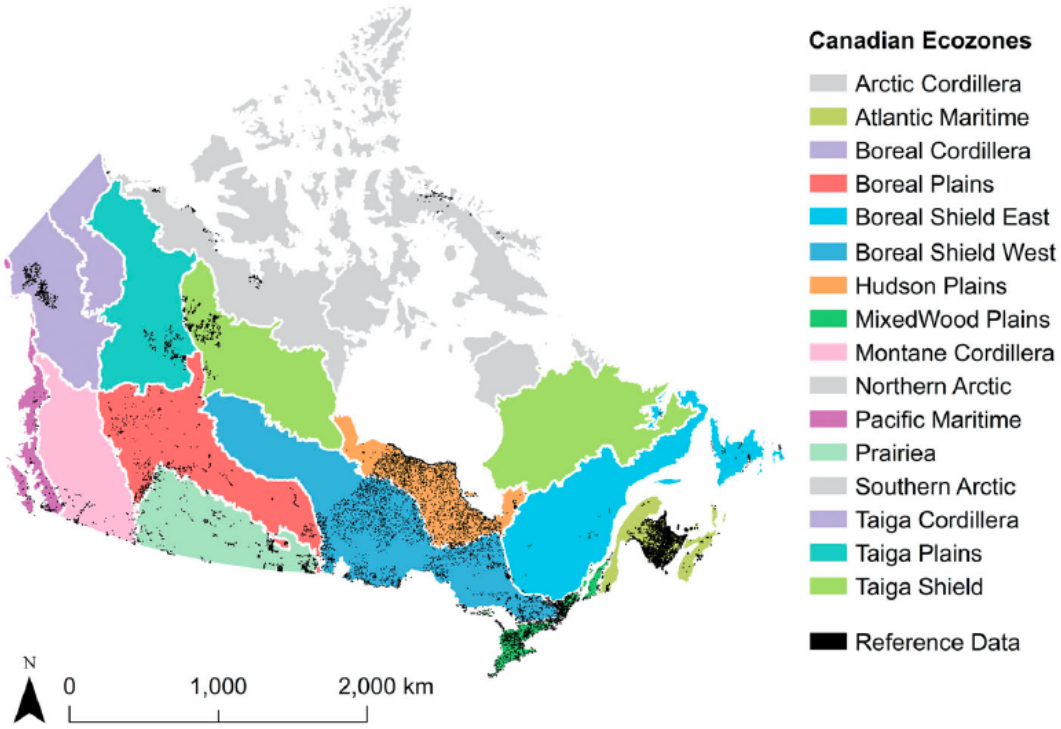

Fig. 2. Ecoregions of Canada. Map data by (Mahdianpari et al. 2020)

In this ecoregion, temperature inversions are common, which frequently lead to warmer temperatures in the alpine (Farnell et al. 2004). The high Boundary and Saint Elias Mountain ranges trap much of the moisture of westerly coastal winds. As a result, this ecoregion is characterized by a rainshadow effect, and is very dry (Demarchi 2011). Annual precipitation is limited to between 250-300mm annually. Permafrost is discontinuous in this region. Multiyear ice patches and glaciers are frequent in the mountains, and high-elevation plateaus in this region, and the ecoregion is home to the world's largest non-polar ice sheet, the Kluane Icefields (Parks Canada Agency 2021). Mountain cordilleras and tundra characterize the northern portion of the Boreal and Taiga Cordillera ecoregion, while the south is primarily comprised of forest. Muskeg, willow birch shrub, subalpine fir and black spruce are the characteristic vegetation of low-lying areas (Demarchi 2011). The altitude of the treeline in the ecoregion hovers between 1050-1200m (Greer and Strand 2012). The lower peaks and alpine ridges contain shrub birch, graminoid species, dwarf willow and mosses (Farnell et al. 2004).

Paleoclimatic data for the Atlin area indicate that prior to 8,000 years ago, the climate was significantly drier and cooler than it is presently (Clague 1980). Pollen core analysis collected in Atlin and Iskut indicate that the postglacial climate was similar to the present, prior to recent warming trends (Clague 1980). Consistent with climatological records elsewhere in the country, climate data indicate that summer temperatures in northwestern BC and the Yukon have been increasing steadily since the early 1990's (Environment and Climate Change Canada 2021). Climate models for the Northwestern Subarctic indicate that a significant rise in annual average temperature is projected over the next few decades, which would be catastrophic for both ice patches and the remaining caribou populations (Environment and Climate Change Canada 2021).

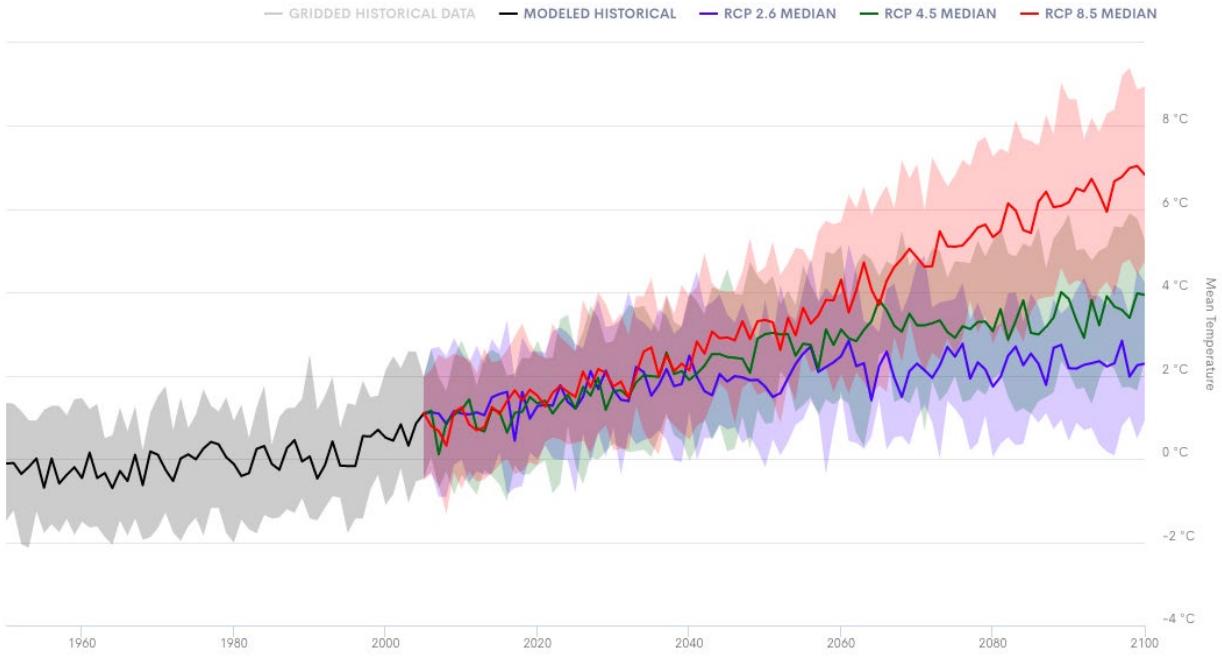

Fig. 3. Historic and projected mean temperatures for Atlin B.C. Climate data from Environment and Climate Change Canada (2021)

Figure 3 indicates the change in mean temperature under high (red), medium (green), and low (blue) C02 emission scenarios. The annual average temperature for Atlin B.C. (the epicentre of the study area) from the 1951-1980 period was -0.6 ºC; for 1981-2010, it was 0.7 ºC; for the period from 2021-2050, the annual average temperature is projected to be 2.3 ºC. Under a high emission scenario, the annual average temperature will rise to 4.3 ºC for the period between 2051-2080 and will reach 6 ºC by the end of this century (Environment and Climate Change Canada 2021). Between 1951-1980 this ecoregion received 425 mm in annual average

precipitation; Under a high emissions scenario, in the period between 2021-2050 the annual average precipitation is projected to be 9% higher. Mean precipitation is expected to be 24% higher than average by the final decades of this century (Environment and Climate Change Canada 2021).

Flora and Fauna

In the following discussion of common flora and fauna in the Boreal and Taiga Cordillera ecoregion, I have provided the species name in Lingít, followed by English and Latin. At lower elevations and valley bottoms species composition consists of *Dúñl* (black spruce, *Picea mariana*), *Leiyís* (subalpine fir, *Abies lasiocarpa*), *Çítçaa* (lodgepole pine, *Pinus contorta*) along with *At daayí (*birches, *Betula papyrifera* and *B. glandulosa*), *Dúñl* (white spruce, *Picea glauca*), *Keishísh* (alder, *Alnus crispa*), *Ch'áal* (willows, *Salix spp*.) and *Yán* (mountain hemlock, *Tsuga mertensiana*) (Edwards 2009; Farnell et al. 2004). The high mountains are rocky and characterized by sparse vegetation. Large ungulates include *Tawéi* (Dall sheep, *Ovis dalli*), *Dzísk'w* (moose, *Alces alces*), and *Watsíx* (caribou, *Rangifer tarandus*). Small mammals include *Yalak'ách'Q* (porcupine, Erethizon dorsatum), *S'igeidí* (beaver, Castor canadensis), *Tsálk* (Arctic ground squirrels, Spermophilus parryii), *Çáý* (hares, Lepus) and numerous other species. Large predators include *Gooch* (wolves, *Canis lupus*), *Xóots* (Grizzly bears, *Ursus arctos horribilis*), *Gaaḵ* (lynx, Lynx canadensis), *Naagas'éi,* (foxes, Vulpes vulpes,), *Nóoskw* (wolverine, Gulo gulo) as well as *S'eek-nóon* (black bears, U. americanus) (Edwards 2009; Greer and Strand 2012).

Previous Archaeology

Previous archaeology in the study area has been sparse. Diana French completed an archaeological site inventory of the major cultural sites on the Nakina and Silver Salmon rivers (French 1974b). In 1988 French recorded village sites on the Inklin, Taku and Nakina rivers in response to concerns about development in the area (French 1988). A few industries-driven Cultural Resource Management (CRM) Archaeological Impacts Assessments (AIA's) have also been completed for a variety of prospective hydroelectric and mining projects throughout the

territory. Previous approaches to archaeology in this region have been focused on the examination of artifacts and archaeological features, such as house depressions, gravehouses, and cache pits. The focus of many of these projects has been the identification and typological classification of artifacts and features.

Borden Number	**Site Type**	**Permit # of Previous Visits**
IiUi-1	PRECONTACT: Cultural Material	1995-055
IiUj-1	PRECONTACT: Ceremonial/Religious Feature	2016-non-permit
IiUj-2	PRECONTACT: Subsistence Feature POSTCONTACT: Building, Other Structure	1975-004
liUj-3	PRECONTACT: Cultural Material TRADITIONAL USE: Food Harvesting	1973-029, 1974-016
IiUj-4	PRECONTACT: Cultural Material	1974-016
IiUj-8	PRECONTACT: Cultural Material	1975-004
IiUj-11	PRECONTACT: Cultural Material	1975-004
IiUj-12	PRECONTACT: Cultural Material	1975-004
IiUj-13	PRECONTACT: Cultural Material	1976-005
IiUn-1	TRADITIONAL USE: Food Harvesting	1971-BCPM
IiUo-1	PRECONTACT: Ceremonial/Religious Feature	1983-University of Wisconsin; 1992-Arch. Branch
IjUn-1	PRECONTACT: Other Feature	2019-non-permitted PFR
IjUq-1	PRECONTACT: Ceremonial/Religious Feature, Habitation Feature, Subsistence Feature	1982-non-permitted
IkUq-1	POSTCONTACT: Building, Human Remains	1973-028
IkUs-1	PRECONTACT: Subsistence Feature	1974-001
IkUs-3	POSTCONTACT: Building, Cultural Material, Habitation Feature, Transportation	1984-018
IkUs-4	POSTCONTACT: Building(s), Transportation	1984-018

IkUs-5	PRECONTACT: Transportation POSTCONTACT: Building, Cultural Material, Transportation	1984-018
IkUs-6	POSTCONTACT: Building, Cultural Material, Transportation	1984-018
IkUs-7	POSTCONTACT: Building, Cultural Material, Transportation	1984-018
IkUs-8	PRECONTACT: Cultural Material POSTCONTACT: Transportation	1991/1992-Parks Canada
IkUs-9	PRECONTACT: Cultural Material POSTCONTACT: Transportation	1992-Parks Canada

IkUs-10	POSTCONTACT: Building, Other Structure, Cultural Material/Refuse	93-001
IkUs-11	POSTCONTACT: Other Structure, Cultural Material	90-00001
IkUt-1	POSTCONTACT: Cultural Material, Transportation, Cultural Depression, Building	1984-018
IkUt-3	POSTCONTACT: Cultural Material, Transportation, Building, Cultural Materia	1984-018
IkUt-4	POSTCONTACT: Cultural Material, Building	1988-043
IkUt-5	POSTCONTACT: Building	1988-043
IlUp-2	PRECONTACT: Cultural Material POSTCONTACT: Building	1973-028
IlUp-5	POSTCONTACT: Human Remains	1973-028
IlUp-8	PRECONTACT: Cultural Material	YT 2007-265
IlUq-1	PRECONTACT: Cultural Material	1973-028
IlUq-2	PRECONTACT: Cultural Material	1973-028
IlUq-3	PRECONTACT: Cultural Material	1973-028
IlUr-1	PRECONTACT: Cultural Material POSTCONTACT: Cultural Material, Building(s)	1984-018

IlUs-1	POSTCONTACT: Industrial/General, Transportation, Building	1984-018

Table 1. Previous archaeology in the study area (Herkes et al. 2023)

Cultural background

Tlingit oral history along the northwest coast of the continent begins, almost uniformly, with a story of a great flood. Geologists and glaciologists have posited that major flooding events took place after proglacial Lake Agassiz, which was two times as large as the Caspian Sea, emptied into the Arctic Ocean 8200 YBP (Clarke et al. 2003). Lake Agassiz was contained by the Laurentide Ice Sheet, and it spanned the Canadian provinces of Alberta, Manitoba, Ontario and the northern United States (Clarke et al. 2003). The massive surge of freshwater not only increased sea levels by 1.4 meters, it also altered the circulation of the north Atlantic, which led to a global cold period that lasted for approximately 400 years (Turney and Brown 2007). The rising sea levels profoundly affected the lacustrine systems of the Yukon, British Columbia and Alaska, and caused widespread flooding (Zazula et al. 2004). Floods also figure prominently in T'aaku Kwáan oral histories. The mountain K'iyán, which is located at the north end of Atlin Lake, was the location where Lingít people survived a great flood by mooring a raft to the top of the mountain (Williams 2023). Anthropologists have recorded dozens of similar tales of great floods from various Lingít communities up and down the coast (Laguna 1960; McClellan 2001).

Fig. 4. Mount K'iyán. Photo by author.

According to Jackie Williams (Yáx góos), the ethnogenesis point of the Taku River Tlingit people began with a migration east from the Alaska coast, up the Stikine River. He writes:

> A long time ago, a glacier extended across the mouth of the Taku River and people did not know the Taku River was there. This is why the Taku Tlingit originally came up from the coast through the Stikine River, establishing a village at Xalak'ách' Héeni ("Porcupine River,"). This river was called the Porcupine because spruce trees sticking out of the glacier looked like porcupine quills. I believe this is the river they now call the Chutine. From here the Tlingit expanded their trapping and began settling the upper Taku River drainage moving downstream along the Sheslay River. There were many large settlements here. There was a big Tlingit village where the Sheslay and Hackett Rivers meet near a hot spring. Another large village was Taxk'i goon at the confluence of the Sheslay and Nahlin Rivers. Taxk'i goon, which is translated as "water at the foot of the hill," refers to water coming out of the foot of a bank. The next village downstream was at the confluence of the Inklin and Sutlahine Rivers. It was called Taxk'i Héeni, which means: "water coming out of the top of a bank," or: "water at the top of a ridge." The white man could not pronounce this name and changed it to Sutlahine. The bank referred to by the name Taxk'i Héeni has since been washed away by the river. The next village

> downstream was called Yéil Héeni, which means “crow creek,” and is now called Yeth Creek. The next big village was at Héen Tlein, which is translated to mean “big water”, and was located at the confluence of the Nakina and Inklin Rivers. The white man changed Héen Tlein to Inklin. The confluence of the Inklin and Nakina Rivers is where the Taku River, by name, begins. The village located there was the main village for the Yanyeidí people and may have had roughly a thousand people living there (Williams 2006:5).

In her memoir *Gagiwdul.at: Brought Forth To Reconfirm The Legacy of a Taku River Tlingit Clan,* elder Elizabeth Nyman (Sédayá*)* recalls a time when her Yanyédí forebears travelled up the Taku river, which was blocked by a glacier (Nyman et al. 1993). In Nyman’s account, Náda.êyá, a Tlingit chief, notices a xh’atuxh.ayîghi (a type of knee length boot) floating in the waters of the Taku that are passing underneath the glacier, and he immediately realizes that there are people living on the other side of the glacier. Soon after, Náda.êyá crosses over the glacier with a canoe in tow, only to discover another group of Tlingit-speaking people north of the glacial dam (Nyman et al. 1993).

Far from an isolated migration account, every major river system that drains into the Pacific has both Tlingit and Athapascan oral histories that speak of subglacial travel (Cruikshank 2005). This first passage eventually led to extensive Tlingit settlements spanning all the tributaries of the Taku River drainage. T'aaku Kwáan village sites and traditional use areas are present at nearly every river confluence in the Taku drainage (Nyman et al. 1993; Taku River Tlingit First Nation 2013; Thornton 2012; Williams 2006). Eventually, Tlingit people would travel over the height of land into the Yukon drainage and would come to occupy the Southern Lakes region, intermarrying with the Tagish and other Athapascan groups that were present in the area. The Southern Lakes region comprises Atlin, Tagish, and Teslin lakes, which are so long and vast they certainly conjure the vastness of life on the West Coast. Tlingit peoples also travelled through the jagged, glaciated Coast Range on a regular basis with great skill and competence (Cruikshank 2005).

Figure 5. Examples of Tlingit *Kwaan* boundaries during the 19th century (University of Alaska Fairbanks 2023)

By the early 18th century, the Tlingit occupied a vast swath of the coast, and also occupied the major interior river systems of the subarctic. With Yakutat Bay at the northern extremity and the Portland Canal as the southern limit, the Tlingit controlled some of the most dramatic and rugged sections of coastline on the planet (Andrei Val'terovich Grinëv 2005; Emmons and De Laguna 1991; Swanton 1909). This is a land of superlatives that always seem to lack in descriptive power. The glaciated Coast Range and the Saint Elias mountains form the jagged spine of Tlingit lands. Most peaks in the cordillera are at least 2,000 meters, and tallest peaks are over twice that elevation. *Tsalxaan* (Mount Fairweather) is 4,663 meter tall, while *Uasi-shaa* (Mt. Saint Elias) is a staggering 5,489 meters tall. The Kluane icefields and the adjacent glaciers of the Coast Range form the world's largest non-polar ice sheet; they form the headwaters of the major river systems of the subarctic - the Taku, the Stikine, the Copper and the Alsek (Cruikshank 2005). The upper branches of these river systems provide access to the dry interior climate, which was essential for

properly curing fish, caribou and moose (McClellan 2001; Williams 2006). The rivers also acted as excellent access points to trade with the Athapascan groups living in the interior.

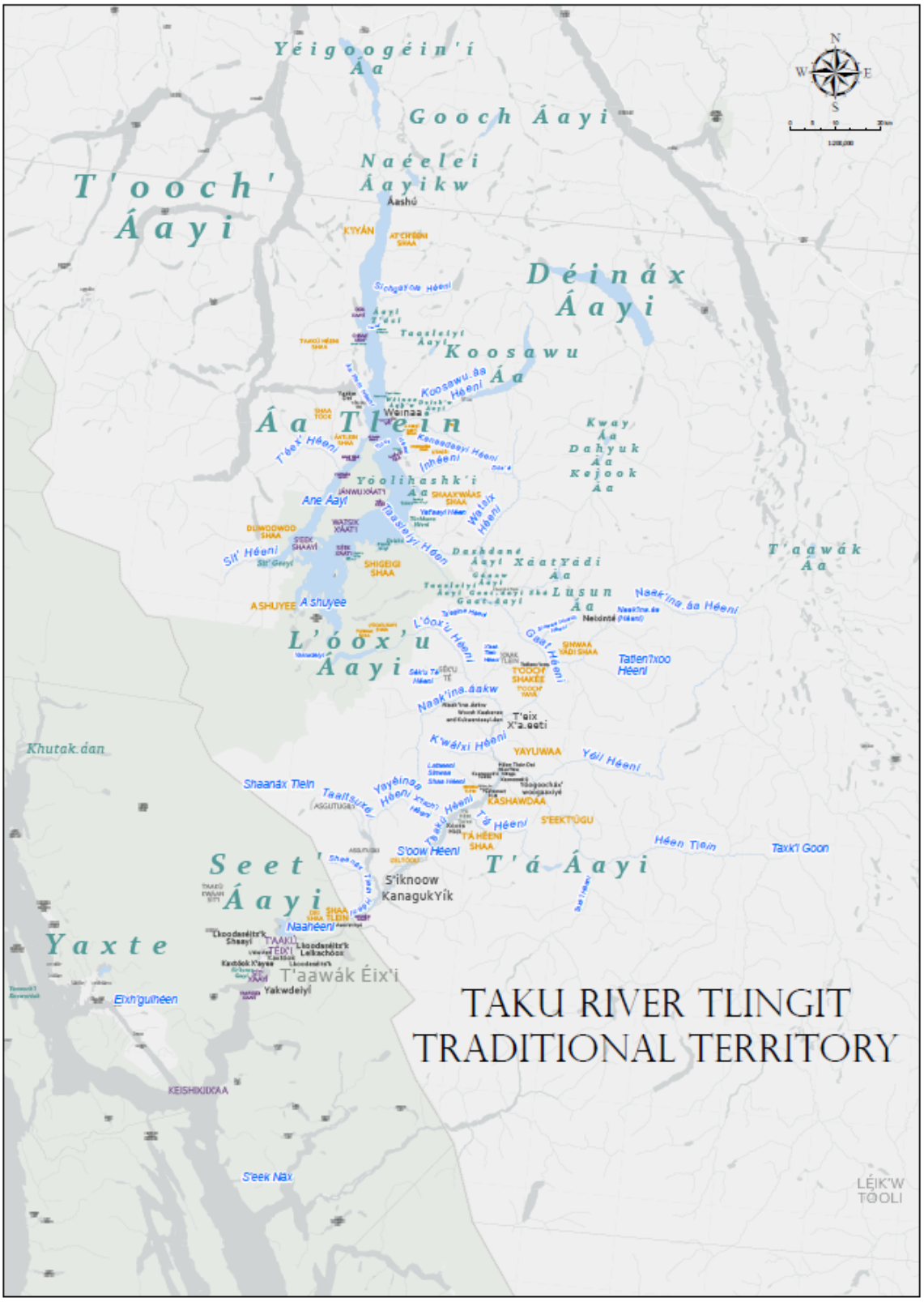

Fig. 6. T'aaku Kwáan traditional territories and Łingít toponyms (Taku River Tlingit First Nation 2022)

Traditional Territories

At the turn of the 19th century, the territories of the T'aaku Kwáan included a large portion of the drainage basin of the Taku River, as well as Atlin lake and the lands stretching north into the Yukon (McClellan 2001:58). Early accounts of who the T'aaku Kwáan were, and where their territories lay are wildly varied. Explorers, surveyors, scientists, gold rush stampeders, missionaries, and fur traders had greatly varied opinions of the Indigenous inhabitants of the Taku River, in part because many of their accounts were largely based on secondhand information (McClellan 2001).

The principal ethnographers of the Tlingit are Swanton, the Dauenhauers, McClellan, Krause and Emmons and De Laguna (Dauenhauer et al. 2008; Emmons and De Laguna 1991; Krause 1885; McClellan 2001; Swanton 1970). Of the ethnographers listed, there are only a few brief mentions of the Taku Tlingit, or the T'aaku Kwáan. McClellan's treatment of the T'aaku Kwáan is by far the most in depth. The T'aaku Kwáan are included in the three "Inland Tlingit" communities of Atlin, Teslin and Carcross, to use McClellan's nomenclature (McClellan and Birckel 1990). Although McClellan's observations are incredibly valuable, it's important to keep in mind that her interviews took place primarily in the mid 20th century long after most Tlingit people had left the Taku basin due to devastating epidemic diseases, the imposition of national and international colonial borders, the Gold Rush, and other factors.

James Teit, who spent several years conducting ethnographic work with the Stikine Tahltan, also made a few observations about the Taku Tlingit. In 1909 he wrote: "Tlingit speaking people occupy the whole northwestern interior of British Columbia, south to and including the valley of the Taku and its tributary the Nakina. This includes Atlin and Teslin Lakes, the Nasutlin River to its head, and the Big Salmon River to its mouth in Yukon Territory. These people have intermarried to some extent with the Athapascan tribes. They depend on hunting and trapping as much as the Tahltan whom they resemble very much in culture. Some families from the interior make periodic trips to the coast, following the Nakina River to its mouth, and then take canoes down the Taku River to Juneau" (Teit 1909:314). In 1912, Teit added: "... the Tlingit... also occupied from time immemorial a considerable part of the interior north of the Tahltans,

including most of the drainage basin of the Taku, and nearly all the northeastern headwaters of the Yukon almost to latitude 62º and east to the Pelly mountains and the height of land dividing Teslin waters from the upper Liard" (Teit 1912:484). From the headwaters of the Taku river, T'aaku Kwáan territory extends south all the way to the mouth of the Taku and the Pacific Ocean (Dauenhauer et al. 2008; Nyman et al. 1993; Swanton 1970; Thornton 2012; Williams 2006). There was cross pollination by both Lingít and Athapascan communities to and from the Alaskan coast and into British Columbia (Swanton 1909). The Tagish language is linguistically distinct from Tlingit and is closely related to Southern Tutchone and Tahltan (McClellan 1953). Tlingit people travelling either up the Stikine or the Taku would frequently trade with and marry into Athapascan families to solidify relationships. Over time, Tlingit came to dominate as the trade language. Many iconic aspects of Tlingit culture including the exogamous clan system, Chilkat weaving, potlatches, and conspicuous consumption were adopted by neighbouring Athapascan groups who had consistent contact with the Tlingit (Andrei Val'terovich Grinëv 2005). This narrative of ancient trade networks, intermarriage, and gradual cross pollination between coastal Tlingit communities and interior Athabascans is echoed by Indigenous oral histories, as well as the accounts of ethnographers and explorers (Clark 1991; Cruikshank 2005; Swanton 1909). There has historically been debate among ethnographers whether the Tagish might be ancient Tlingit who had remained in the interior for so long that their customs and language came to resemble the Athapascans, or whether the opposite is true (Jenness 1934; McClellan 2001).

Ethnographer Catherine McClellan coined the term "Inland Tlingit" because there was considerable confusion around the use of the terms *Taku*, *Takutinne*, and *Takuquan*, which had been applied by early 19th century European visitors to various groups, and the terms were used interchangeably (McClellan 2001). McClellan preferred the term "Inland Tlingit," because it created a clear distinction from the Tlingit people who reside in southeast Alaska (McClellan 1953). McClellan's linguistic subdivision of the Inland Tlingit from the other Tlingit communities on the coast seems to be more of a reflection of colonial boundaries rather than Kwáan or clan boundaries. The Alaska panhandle was delineated by the Russian American Company in 1825, but the eastern boundary was not enforced (Andrei Val'terovich Grinëv 2005). After the Alaska Purchase by the United States, and a considerable arbitration with Canadian officials, the present-day international border was established in October of 1903

(Pedersen 1978). In a 1913 report, Indian Agent Scott Simpson commented on the territories of the Atlin Band: “This band is closely allied to the Thlinkit (sic) and Tackoo (sic) tribes of the coast, and was originally living in a village near the junction of the Nahlin and Sheslay, which form the Tackoo river. They traded with the coast Indians prior to the influx of miners into Juneau, Alaska, which afterward became their nearest trading point and place of resort during the summer months, which accounts for the erroneous statement that they were American Indians. Since the opening of the placer mines in Atlin, these people moved into that section of the country and have made that place their rendezvous for the past fifteen years’ (Taylor 1985:51).

During her interview about the extent of Taku Tlingit territory during the Alaska land claim proceedings in 1946, Tlingit informant Mrs. Jenny Klaney made the following statement: “The original home of the Taku people was on the Taku River. After the establishment of the international boundary, the Taku Tlingits split into two groups, one living up stream on the shores of Lake Atlin, and the other remaining on the coast. The two groups still recognize their unity and maintained contacts” (Goldschmidt and Haas 1946:66–67). Statements such as Mrs. Klaney’s illustrate a history of kinship that was and is negatively impacted by the imposition of colonial borders. Mrs. Klaney went on to describe the effects on the Taku people that the border created: “Before the boundary was established the Taku village was on the Canadian side, but later it was moved to the mouth of the river. Taku Village was called [Asgutugíl'i]. There was another village above this one on the river called [Taaltsux̲éi].... There was a third village still further up called [S'iknoow] [Black Bear Fort] (Thornton 2012:68). Another Tlingit informant interviewed by Walter Goldsmidt while compiling his report for Indian Affairs shared that “...the Taku people went up the river as far as the confluence of the Nakina River, and that they had fish camps on this river and the Sloko. They have also had a camp on Canyon Island on the Taku River about three miles below the Canadian boundary” (Goldschmidt and Haas 1946:66–67)

Clan System

The foundation of Tlingit social structure is the matrilineally organized moiety and clan system. There are two preeminent moieties, Wolf and Crow, which are exogamous, and which play an important role in determining suitable matrimonial partners and ordering social obligations. An appropriate partner for a Wolf is a Crow and vice versa. The Eagle is substituted for the Wolf in some northern Tlingit societies (Andrei Val'terovich Grinëv 2005; McClellan 2001; Swanton 1909).Those who broke protocol and married a partner who was either from the same moiety or the same clan committed a major crime, and faced ostracization and even banishment from their community (Emmons and De Laguna 1991; McClellan 2001; Swanton 1909). To this day, romantic relations between members of the same clan are seen as inappropriate, although the punishment is usually much less severe.

Moieties are subsequently divided into clans, and each clan is divided into houses. Each clan has its own name, such as Yanyeidí, Lkweidi, Teikweidí, Ishkahítaan, X'at'ka.aayí, and Koosk'eidí. Similarly, each house also has its own name. For example:

MOIETY: Wolf

CLAN: Yanyeidí

HOUSE: Yayuwaa Hít (BETWEEN THE RIVER FORK HOUSE)

For severe crimes, an individual could have their clan's name taken away. On one occasion a Tlingit man joined the Russians in an attack against another Tlingit clan. For this action, his clan name was stripped from him, leaving him without a social identity (Sealaska Heritage Institute 2023). Songs, names, stories, crests, robes, dances and patterns are considered at.óow (sacred clan property) and may only be shared under prescribed circumstances (De Laguna 1972).

Fig. 7. T'aaku Kwáan Kwaay marker at the Tatlenx'ixoo (Bestrewn with big rocks) village site. Photo by author.

Groups of clans are organized into kwáans. A kwáan is a unit of social geography that refers to the lands and waters controlled by a group of clans that occupy specific villages (Andrei Val'terovich Grinëv 2005; Thornton 2012). Examples are: Laaxaayík Kwáan: Yakutat area (Near The Ice People), T'aaku Kwáan: Taku (Geese Flood Upriver Tribe) and Hinyaa Kwáan: Klawock (Tribe From Across The Water). Clans that belong to a specific Kwáan share and control the resources of the region. A person could spend their entire life living in a different territory, and it wouldn't impact their kwáan membership (Sealaska Heritage Institute 2023). Thomas Thornton notes that "geographic references are embedded in personal names, clan names, house names, and most obviously and unavoidably, in kwáan names, which define community territories. To say you are "Sheet'ká Kwáan" literally means that you are an organic member of the community of Tlingit people who dwell in the vicinity of Sheet'ká (Sitka), which is itself a geographic name

meaning the “Ocean side of Shee (Baranof Island).” In this way personhood and place are intermeshed” (Thornton 2012 introduction xix). Kwáans often identify their territorial ownership by carving *Kwaay* (territorial markers) into trees. Dissimilar from the clan and moiety system, kwáans were applied to non-Tlingit peoples such as the Tagish who dwelled on the periphery of Lingít territory, and to non-human beings (Thornton 2012). "Origin sites often taken by the clan and, as such, were considered sacred property (at.óow). Clans not named for natural sites often took their identity from some aspect of the village geography, such as an architectural feature of their clan house (e.g., the Kaagwaantaan, "Charred house People") or its location within the village (e.g., the Deisheetaan, "End of the Trail House People"). The linguistic homology between clan names and scared geography served to reinforce strong material, social, and spiritual ties to place among clan members, and the understanding of these ties was considered to be an essential component of one's heritage and identity (shago'on)” (Thornton 2011:47–52).

Economy and lifestyle

The T'aaku Kwáan, like most peoples living on the east side of the Coast Mountains, were semi-nomadic. The Taku river is approximately 87 kilometers long, and it runs on a roughly north to south axis, before pivoting to an east to west orientation as it cuts through the Coast mountains. The headwaters are located in the arid interior plateau, while the terminus in the Pacific is surrounded by lush vegetation and a coastal climate. This climatic variability led to different subsistence lifestyles. For those Tlingit who lived on the upper branches of the Taku, it was necessary to adopt a northern Athapaskan style of hunting big game such as caribou. The Lingít use of technologies such as caribou fences, which were used to corral and constrain large herds (at which point they could be easily shot with arrows) illustrates the knowledge transmission that took place between Lingít and Athapascan peoples. For those who lived in villages closer to the coast, marine mammals such as seals were also hunted (Nyman et al. 1993). Seagull eggs and herring eggs were considered a delicacy. Smaller game such as sheep, goats, grouse, ptarmigan, and groundhogs were also hunted (McClellan 2001). Between August and October several different species of berry, such as soapberries, cranberries and crowberries were picked and dried into cakes (McClellan 2001). Many of these species are still actively harvested today. Wild onions and bear roots were also harvested as a source of carbohydrates. The flesh of large game

animals such as moose and caribou were a staple in the winter months. Hides were used for clothing, babiche (braided sinew rope), and shelter. Bones were used to craft tools. Salmon harvesting was (and is) a ubiquitous activity for families residing in the northern regions of the territory near Atlin Lake as well as near the mouth of the Taku. In the summer, villages along the tributaries of the Taku were primarily used as fish camps, as the salmon runs were plentiful. Fish was dried on racks and stored in caches that are visible at all of the old village locations to this day. The interior was much better suited to drying all kinds of meat than the damp coast. Many types of meats were cooked by boiling in spruce root baskets. Hot rocks were dropped into the baskets to boil the water and cook the contents (McClellan 2001).

Tools such as projectile points, knives and scrapers were made predominantly of obsidian or chert. There are multiple chert quarries in the traditional territory, which contain a highly siliceous raw material suitable for knapping. Obsidian was predominantly procured from Mt. Edziza, although trade with coastal Kwáans could yield obsidian from coastal sources such as Suemez Island and Kupreanof island (Erlandson et al. 1992; Madonna L. Moss and Jon M. Erlandson 2001; Schmuck et al. 2022). Wood and bone were also used for making fishhooks, needles, adornments, charms, and other tools (Stewart 1996).

By the mid 20th century, many of the village sites on the Taku had been abandoned. The exact cause is not clear, although epidemic diseases, and the imposition of the US border certainly played a devastating role. This aspect will be further discussed in the “European encounters with the T'aaku Kwáan” chapter. T'aaku Kwáan villages on upper Taku drainage were comprised of plank longhouses of the coastal Tlingit style, often decorated with intricate line form (McClellan 2001). McClellan and Emmons have both stated that Tlingit people arrived in Atlin once the gold rush began (Emmons and De Laguna 1991; McClellan 2001). There is no doubt that the arrival of up to ten thousand gold seekers was a completely anomalous event that would have persuaded some Tlingit individuals to participate in the cash economy. By the time the Klondike gold rush began Tlingit people had already been in contact with Europeans for centuries, and they had proven themselves extremely efficient at preventing Europeans from entering the interior, making the Tlingit extremely powerful as middlemen between the Europeans on the coast and the Athapascans of the interior. Up until the mid-20th century, many “Inland Tlingit” families

would spend weeks or even months of the year away from the recognizable communities, hunting and trapping (McClellan 2001).

Although villages on the Taku featured more permanent, coastal Tlingit style dwellings, many of the hunting camps used for a few months out of the year were more expedient in nature. Circular houses were used extensively by the T'aaku Kwáan, especially in the interior regions used during the seasonal round. Styles varied, but in general, they were conical in shape, the central support being either a tree or a pole and covered with either branches or hides. Each clan "built houses with a circular ground plan…. One man said that a square "box" was set in the apex for a smoke hole. He specifically compared it with a windscreen in a coastal Tlingit house. At any rate, the fireplace was in the center. There was only one door. Such houses were evidently fairly large, and they too were occupied by several families" (McClellan 2001:242).

Relations with neighbours

The Nass and Skeena rivers are reported to be the ethnogenesis point of the Tlingit people as a whole, from which point they began to occupy the northwest coast (Andrei Val'terovich Grinëv 2005; Swanton 1909). It is likely that martial pressure from the Haida and the Tsimshian forced the Tlingit north. The Haida, in particular, were actively seizing Tlingit lands in the early 18th century. In 1730 the Haida occupied the southern half of *Taan* (Prince of Wales island), formerly a Tlingit possession (Andrei Val'terovich Grinëv 2005). The new settlement of Haida colonists was known as *K'yák áannii*. During the time that John Swanton travelled the west coast, Tlingit place names for villages recently occupied by the Haida were still in use (Swanton 1909). Despite their occasionally antagonistic relationship with the Haida and the Tsimshian, the Tlingit admired the refinement of their cultures, and considered them high status (Henrikson et al. 2015).

Although they esteemed the Haida and the Tsimshian, the Tlingit generally looked down upon their Athapascan neighbours to the East, as well as the Eyaks, Tutchone and the Chugach to the north. Athapascan groups such as the Tagish, the Tahltan and the Southern Tutchone did not have an exogamous clan system in place, which meant that they did not couple well with Tlingit

culture, as the clan system was (and is) the foundation for nearly all social interactions (Andrei Val'terovich Grinëv 2005; McClellan 2001; McClellan and Birckel 1990; Swanton 1909). By the early 18th century, the Tlingit had displaced and occupied much of Eyak, Athapascan, and Chugach territory on the west coast including Kayak Island, the Copper River, Controller Bay and Dry Bay (De Laguna 1972). Tlingit control of all major access points to and from the Northwest Coast is well documented by Emmons and DeLaguna (1991). These routes included the Stikine and the Taku rivers, in addition to the Chilkoot and Chilkat mountain passes.

Long before the fur trade with Europeans began, or the subsequent gold rushes, there was a robust trade network between Tlingits and Athapascans (Cruikshank 2005; Emmons 1911; Emmons and De Laguna 1991; McClellan 2001). Despite extensive intermarriage and trade between the Tahltan Athapascans and both the Stikine Tlingit and the Taku Tlingit, conflict over territory, specifically hunting and fishing areas was common, especially in the southern Taku watershed (Teit 1909). The fur trade and the subsequent gold rushes certainly intensified existing rivalries. The Tlingit word for Athapascans is *Go'nana*, which means "strange or different nation" (Swanton 1909).

The relationships between the Lingít and the Tahltan Athapascans was complex, oscillating from collaborative to violent. For example, the seasonal village of Taxk'i goon/Tagoon at the confluence of the Sheslay and Inklin rivers contained up to 2000 people of both Tlingit and Athapascan heritage (French 1978). The village site bears both a Lingit and an Athapascan name, which speaks to its usage by both groups. This site, however, was also the location where a full scale battle took place between the two groups, which left many injured or dead and the village itself destroyed. Beginning around the 1880's, blood feuds and subsequent retaliatory attacks between the Tlingit and the Tahltan turned into a war that lasted for 10-20 years. The commercial fur trade and the provincial trapline registry system exasperated intragroup competition and ownership, leading to further blood feuds and subsequent retaliatory attacks. Tlingit elder Eva Carlick and Tahltan elder Emma Brown recorded their oral histories of the war with Georgiana Ball, a reporter for The Alaska Journal in 1973. The following is an excerpt from Ball's article:

> Two Tlingit men went to the Tahltan fishing camp of Sheslay with the sad news of the death of a young Tahltan woman who was accidentally killed by her Tlingit husband near Tatsemini Lake. The Tahltans did not believe it was an accident and threatened to kill half of the Tlingits. A war started, and the Tahltan killed many Tlingit. In retaliation, the Tlingits attacked the sleeping Tahltan village at Sheslay at night. It was a brutal fight, and the Tlingits took four prisoners. Eva Carlick said: "They can't do nothing. Make 'em walk ahead. They take 'em right to Taku River — right to old home...They take them across the river. The slave tipped the boat while they were crossing the river. She said, 'I'm not going to slave for no Tlingit.' Everyone got saved but her — she got drowned. The others swim right to shore. So the Tlingit got nothing. The others ran away, come back to Tahltan." The Tahltans attacked the Tlingits on the Taku after the Sheslay massacre but were again defeated. It was only when the Tahltans acquired muskets about a year later that they evened the score. The war continued for 10 years. The Tlingit war chief Ston'quat' finally decided to end the war. "Fifteen Tlingits accompanied Ston'quat' on the peace mission. They traveled to Tahltan territory in the winter, 'about Christmas month,' when the Tahltan families were scattered 'out in the bushes' trapping fur. The cautious peace missionaries wanted to encounter only a few Tahltans at a time. When the Tlingits arrived at Sheslay they found it deserted. No one had re-established a home there since the massacre. Ten miles farther on, at Salmon Creek, they found Nah'zay'ta and his crippled wife." He told them the war should end, and the others agreed and would spread the word and gather up Tahltan people. "Although Nah'zay'ta explained that many Tahltans had to come great distances, Ston'quat' waited for them impatiently... Finally the Tahltan soldiers, who far outnumbered the fifteen Tlingits, arrived at the Salmon Creek fishing camp. The situation was tense... Nah'zay'ta called the Tlingits out of the bush. All of the Tlingits and about ten Tahltan head men went into Nah'zay'ta's fish house. The rest of the Tahltans stayed outside." One man from each side counted up the dead and squared the account." To ensure that the peace would last, each side gave a beloved son of the most important head man of each tribe to the other group, and the following year they met again on the Taku for a celebration (Cox 2000:16).

In "Two Tahltan Traditions" Teit also describes how, after many years of feuding and retaliatory attacks, the Tahltan and the Taku River Tlingit made peace at the mouth of Salmon Creek, a well-known watershed boundary separating the Taku and Stikine basins (1909). There is a prominent red rock located at the mouth of Salmon Creek known as "Treaty Rock ", or *Le'ik'w To'oli* in Lingít (Williams 2006:15).

Fig. 8. Treaty Rock ", or Le'ik'w To'oli located near the Taku/Stikine watershed divide (Williams 2006)

European encounters with the T'aaku Kwáan

Although Spanish explorers had reached Alaska by the 16th century, the Bering-Chirikov expedition of 1741 marked the beginning of a new era of colonial excursions into Lingít territories (Andrei Val'terovich Grinëv 2005; Dauenhauer et al. 2008). After a brutal and repressive military campaign against the Aleut population of the Aleutian Islands, the Russians forced the Aleuts to participate in the dangerous work of hunting sea otters as their virtual slaves. Russian historian V.N. Berkh noted that "rumor of this newly discovered land's wealth excited the enterprising Siberian merchants, and the stories of Bering's and Chirikov's companions inflamed even more their desire to become rich in sea otter skins" (Berkh 1823:1). Sea otter pelts were extremely valuable in both Europe and even more so in China, specifically through the controlled port of Guangzhou (Canton).

From a fort established on Kodiak Island, the Russians began to explore the coast of Southeast Alaska in hopes of expanding their extremely profitable fur trading enterprise. In 1774, the Spanish, provoked by the vigorous expansion of Russian interests in land that they had previously claimed, sent out the schooner *Sonora* , captained by Juan Francisco de la Bodega y

Quadra, with the intention of re-asserting Spanish interests on the northwest coast (Andrei Val'terovich Grinëv 2005). Pope Alexander VI's papal bull "Inter Caetera," which was published on May 4, 1493, was crucial to the Spanish colonial interests in North America. It effectively facilitated and legitimized the seizure of land from any non- Christian inhabitants. Quadra and the crew of the *Sonora* noted Tlingit villages on Prince of Wales Island, as well as on Baranof Island, at Sitka. They went ashore at Sitka, exchanged some beads and cloth with the Tlingit, and then proceeded to carve a cross in a nearby cliff, as well as erect a wooden one, as a symbol of Spanish sovereignty (Pérouse 1807). This cross was immediately torn down by the Tlingit, as they recognized it as a symbol of territorial ownership, similar to the way in which pictographs and petroglyphs are used to mark clan owned territories (Worl 1998). Quadra was not overly interested in the Indigenous inhabitants, but rather his interest was in lawfully securing the Spanish crown's claims to the new territory with this legal pretext (Andrei Val'terovich Grinëv 2005).

Illness, possibly smallpox, struck the Spanish crew at Baranof, and they went no further north. This voyage was possibly the inception point of the many waves of epidemic diseases, which would devastate Indigenous communities in North America (Pérouse 1807). The Spanish did not have the political or economic might to back up their claims to the northwest coast, and soon after James Cook's 1778 voyage, the English began to displace Spanish interests. The French too were interested in participating in the fur trade on the northwest coast, and in 1786, Captain La Pérouse made contact with the Tlingit of Lituya bay and traded with them, and went on to surreptitiously rename the bay Port-des-Français (McClellan 1970). The Lituya Tlingit traded sea otter skins for iron, an extremely valuable material that they knew how to work into tools and weapons. The onset of the Napoleonic Wars abruptly put an end to French visits to the northwest coast, while the English redoubled their efforts to capitalize on the fur trade. A total of 35 English ships arrived in the period 1785- 1794 (Howay 1973). However, the Russians still had asserted and vested interests in the region.

At this point, the Tlingit had secured guns from trading with various European traders and explorers. Some Kwáan did not welcome the constant visits, or, in many cases, the unauthorized slaughter of sea otters on kwáan-managed lands. The Jilkáat (Chilkat) Kwáan attacked Captain

Vancouver's crew, and Vancouver himself grew worried about the powerful (and now well-armed) Tlingit (Vancouver 1833).

In 1794 the Russians, under the leadership of E. Purtov, sent out hunting parties comprised of up to one thousand Indigenous Kodiak and Chugach to hunt sea otters in Yakutat Bay (Andrei Val'terovich Grinëv 2005). The Kodiak and the Chugach were old enemies of the Tlingit, as the Tlingit conquered large tracts of their former territories in years past. Diplomatic attempts on the part of the Yakutat Tlingit chief, intended to convey the severity of the offences committed, ultimately failed. Poaching of sea otters continued by Europeans, as did retaliatory attacks from the Tlingit. In 1796 Alexander Andreyevich Baranov arrived in Yakutak with 80 Russian colonists and established the first settlement on Tlingit lands (Andrei Val'terovich Grinëv 2005). A few years later, in 1799, the Russians built a fort on Baranof Island, at Sitka (Dauenhauer et al. 2008). Perhaps learning from the mistakes made a few years earlier in Yakutat, Baranov offered to pay the Sheet'ká (Sitka) Kwáan for the plot of land that the Russian settlement was built upon (Dauenhauer et al. 2008). The construction of this fort also coincided with the formation of the Russian American Company, which was mandated to both manage the growing colonial enterprise, as well as to pursue economic opportunities (Fedorova 1971).

Meanwhile, the American presence on the northwest coast was growing and becoming more aggressive. The Americans, mostly New Englanders, unlike the Russians, had no intention of establishing colonies. Rather the Americans were more raiders than traders, with little motivation for Tlingit diplomacy beyond obtaining sea otter pelts by any means necessary. On several occasions, unscrupulous American fur traders took hostages in order to extort the Tlingit for sea otter pelts, and on several occasions villages were bombarded by cannons for the same reason (Andrei Val'terovich Grinëv 2005). While the Russians had a stake in maintaining friendly relations with their hosts on Baranof Island, their tendency to break Tlingit protocols irritated relations even more. The Russian traders frequently took Tlingit wives without paying the traditional dowry (Jacobs Jr 1990). The Sheet'ká Kiks.ádi clan was also beginning to be mocked by other Kwáans for allowing the Russians to both occupy their territory and treat them like slaves (Kan 1990). The manifold insults and trespasses of the European interlopers led to the 1802 attack by the Kiks.ádi clan and their allies on Fort Mikhailovskii. The Tlingit coalition,

which included forces from nearly all the Kwáans on the coast, burnt the fort to ashes, killing most of the inhabitants, while taking the women and children as captives (Andrei Val'terovich Grinëv 2005; Dauenhauer et al. 2008). Two years later the Russians returned to Sitka with several battleships, and after a prolonged siege of the newly built Shiksi Noow (Fort of the Young Tree), the Russians burned the fort and the Tlingit inhabitants were forced to flee to the mountains (Dauenhauer et al. 2008). In 1805, the Tlingit retaliated by burning down the Russian fort at Yakutat.

Although relations between the Tlingit and the various European parties aiming to gain an economic and political foothold on the northwest coast were uncomfortable at the best of times, and were frequently riddled with violent encounters, for the most part they were, at least financially, profitable. The Tlingit were becoming extremely wealthy as a result of their position as middlemen between the interior Athapascans and the European traders. They had almost unlimited access to desirable goods like metal weapons, firearms, cooking utensils, cloth, and more. Competition between the Russians, the French, the Americans, and the English was also driving the costs of Europeans goods down. The Tlingit became known for driving a hard bargain, and they were not shy about extorting their Athapascan neighbors. Famously, the Stikine chief Shakes barred a Tahltan Athapascan chief from visiting the coast, unless he paid the exorbitant sum of five hundred beaver skins (Emmons and De Laguna 1991). Oral histories from the Jilkáat Kwáan (Chilkat) tell of similar practices; Oberg reported that after the Chilkat had purchased a flintlock rifle for a bale of skins as tall as the rifle, they then doubled the price, and sold the same rifle to the Athapascans for a bale of skins as tall as two rifles (Oberg 1973).

The Tlingit jealously guarded their highly profitable position, and for many years they prevented the Russian American Company and the HBC from building trading posts on the upper branches of the Taku and the Stikine, as this would undermine their relationship with the Athapascans. Commenting on the population of the T'aaku Kwáan, and on their opportune situation as middlemen, Russian American Company employee N.P. Rezanov wrote in 1805 or 1806:
"At the mouth of Taku Inlet [Bukhta Takku] the settlements are not so populous, but the interior is inhabited by many peoples engaged in land animal procurement, such as: foxes, marmots, and others. They [Taku people] take few themselves, but, obtaining trade goods with the Bostonians

– worsted and such – they trade with the mountain peoples of the mainland, getting [from them] moose hides, caribou hides etc" (Dauenhauer et al. 2008:112).

After witnessing the many negative impacts of allowing the Russians and the English to establish posts in various locations throughout Lingít Aaní, the Tlingit also had an incentive to prevent the spread of warfare and conflict from reaching other parts of their territories. Although there are no company records of this instance (possibly because it was unsuccessful), T'aaku Kwáan elder Yáx góos (Jackie Williams) recalled an attempt by the Russian American Company to establish a fort near the confluence of the Héen Tlein (Inklin river) and the Naak'ina.áa Héeni (Nakina River). This was where the Yayuwaa Hít (Between the River Fork) Yanyedí clan house of the T'aaku Kwáan was once located, in addition to three other clan houses (Swanton 1909; University of Alaska Fairbanks 2023; Williams 2006). Yáx góos' oral account of the Russian attempt at occupying the Taku goes as follows:

> The first time Russians came up the Taku River they came at the wrong time, as the Tlingit clan leader was not at Héen Tlein (Inklin). The Russians started building a fort just below the Tlingit village, at a site downstream of the Nakina/Inklin junction on a bend of the river that allowed them a good view to the south, down the Taku River. The Tlingit people chose two young men to tell the clan leader, who was at Johnson Town (Teslin Lake). The men went to Johnson Town via the Yéil Héeni (Yeth Creek) trail. The clan leader returned and asked the Russians what they were doing. The Russians said they were building a fort to trade furs with the Tlingit. The clan leader said there was no way they could build on Tlingit territory. The clan leader said the Tlingits would have a meeting about it. The Russians came to the meeting with flour and raisins and said they wanted to make a deal in the good way to allow the Russians to have a fort there. The Russian headman said he knew he had done wrong to start building without asking. The clan leader told the Russian he would let him know the outcome of the meeting the following day. The Tlingits decided they did not want the Russians there. They wanted to protect Yayuwaa, their fish camps, and also the Russians were cutting down lots of trees. So the next day the warriors in the village dressed for battle and went down to see the Russians. The clan leader told the Russians they had until the sun gets "up there," pointing to the sky (around noon), the next day to leave. The next day the Tlingit warriors surrounded the fort and told the Russians to get out of the Taku and never come back. After the Russians left, about 10 Tlingits got into canoes and followed the Russians down to T'aakhú Téix'i (Taku Heart) to make sure they were right out of the Taku River. The Russians left lots of stuff behind including food, steel bear traps (trap size: #14), several boats and cannon guns (I believe there were 2 guns, one had wooden wheels like a cannon and one was just the gun). The unfinished fort remained standing, but had no roof. The guns the Russians left behind ended up in caches at Katlénxé tú, the Tlingit

> village on the Nakina River at the Silver Salmon confluence. I saw one of these guns in a cache there in the mid-1940's. If the Tlingit had not run the Russians out of Inklin, this area would now likely be part of Alaska. This shows how the Tlingit people defended their territory (Williams 2006:19).

Yáx góos' account adds to the long lineage of strong Tlingit leaders who have done what was necessary to prevent exploitative incursions, and gradual territorial erosion by Europeans. The fierceness of the T'aaku Kwáan kept European encroachment to a minimum throughout the early contact period. The Taku Tlingit were, at least initially, unwilling to participate in trade with the Russian American Company employees who surreptitiously decided to build a fort without Tlingit permission, as Yáx góos' oral history indicates (Williams 2006). Similarly, early attempts at establishing fur trading posts on the Taku by the Hudson's Bay Company were also unsuccessful, for a mixture of commercial and biological reasons. Built in 1840, Fort Taku[2], built near present day Juneau was only in operation for three years, before the HBC decided that it would be more profitable to have the vessel *Beaver* meet fur traders at various locations along the coastline (Mackie 1997).

Gold prospectors faced many of the same challenges that aspiring fur merchants did. In her 1885 book "Alaska Its Southern Coast and the Sitkan Archipelago" author and National Geographic Society correspondent Eliza Ruhamah Scidmore wrote of the indomitable nature of the Taku Tlingit in the presence of European gold seekers, and remarked, "prospectors have had their camps at the mouth of the river at the head of the basin, and have searched the bars and shores of Taku River for miles across the mountain wall... All of this Taku region is rich in the indications of precious minerals, and prospectors have explored miles of the most rugged mountain country in their own search for float and gravel. The presence of gold along the shores of Taku River was long known, but the Taku Indians, who guarded the mouth of the river and kept the monopoly of the fur trade with the interior Indians, were known to be hostile and kept prospectors aloof" (Scidmore 1885:79).

In 1891, a second HBC post was established in the Taku drainage, this time farther into the southern branches. Egnell Post was established at the Sheslay river confluence. Egnell Post was

[2] Also known as Fort Durham

soon deemed to be a commercial failure and it was subsequently abandoned, as trade was too meagre to justify the existence of the post (Cox 2000). The real reason that Egnell post was deemed to be unprofitable had more to do with the proliferation of epidemic diseases imported from Europe, than it had to do with unwilling trading partners.

On a mission to survey a viable road or railway route from the Stikine northward into the Yukon E. J. Duchesnay, Arthur St. Cyr and W. T. Jennings travelled through the Taku basin in 1898. There was a trail along the Taku River that split in two directions; one branch led to Atlin and Teslin, and the other went north towards Tagish (Coates 1998). They encountered a landscape with an eerie absence of human life. In his 1898 report to the Department of the Interior, W.T. Jennings described his impression of the Taku drainage: "There are very few Indians living in the district which is apparently hunted over by, and under the control of a tribe whose headquarters are on the Nakinah River (sic) at head of canoe navigation on the Taku River and distant about 70 miles from the Teslin Lake" (Jennings 1898:13). By 1898, epidemic diseases such as tuberculosis and smallpox had decimated Tlingit populations all along the west coast, including the Taku basin, reducing populations to a fraction of their former abundance. When Jennings, St. Cyr and Duchesney reached the Egnell Post on the Sheslay River, they found the fur trading station abandoned. St. Cyr managed to piece together what had happened: "In the fall of 1891 the Indian tribe which used to trade with the company was decimated by some contagious disease; the post having lost its usefulness had to be abandoned shortly after. Some roofless huts indicate to-day the place where the post stood; it is still frequented for a short time during the fishing season by a few Indians from Taku" (Cox 2000; St. Cyr 1898:105). In the period from 1869 to 1890, Tlingit populations at the mouth of the Taku dropped by a staggering factor of ten, from 2,000 to just over 200 (McClellan 2001). The situation at the mouth of the Taku was mirrored in the upper branches of the river, as well as in Atlin. Large villages at every confluence of the Taku river became ghostly in just a few short decades. The Indian Agent stationed in Atlin recorded just 150 Tlingit in 1915, and he went on to note that "It is a well known fact that the major part of the Indians are dying much more rapidly than the whites and the cause of their dying off so rapidly is attributable to tubercolosis [sic]" (Royal Commission on Indian Affairs 1915:2).

When gold was discovered in the Atlin in 1885, a stampede of gold rushers travelled up the White Pass from Dyea, then travelling across Tagish Lake and Atlin lake via steamship, bypassing the closely guarded Taku River completely (Cox 2000). By that time, epidemic diseases had taken such a grievous toll on Tlingit populations, that they simply did not have the ability to manage the thousands of outsiders who were stampeding into their territory. After the Atlin gold discovery, approximately 8,000- 10,000 gold seekers flooded the Lingít hunting camp of Wéinaa (alkali place) (Mitcham 1989; Taku River Tlingit First Nation 2013). Wéinaa is where the Klondike town of Atlin was built.

By maintaining a hunting camp in the immediate proximity of a critical resource like an alkali playa, caribou, moose and other ungulates could be hunted more easily by relying on this passive attractant (Andrews et al. 2012). Caribou and other ungulates require sodium to maintain proper physiological function; both the plants surrounding the playa, as well as the alkali itself contain high levels of sodium. Speaking of the importance of mineral licks in Shúhtagot'in culture, Andrews writes: "while important to moose, caribou, and sheep, mineral licks are considered critical habitat for ewe groups (ewes and juvenile sheep); indeed… the summer ranges of ewe groups are largely determined by access to mineral lick locations"(Andrews et al. 2012:30). Mineral licks are a limited, but necessary resource for caribou, as they provide essential micronutrients and minerals. Very few of these gold seekers travelled up the Taku from the coast, and instead they travelled up through the Chilkoot Pass near Skagway. While epidemic diseases were exacting a heavy toll, caribou populations, one of the main winter food staples for the T'aaku Kwáan, were being decimated at an incredibly unsustainable pace. The gold seekers were extremely reliant on wild meat for food, as the subarctic climate is poorly suited to agriculture. So many caribou and moose were being killed to feed the huge influx of miners that cattlemen "were amazed and disillusioned to learn on their arrival to Atlin in the autumn of 1898 that their beef was not in demand"(Mitcham 1989:148). Data from just a few years later (1909) indicate that the average annual meat consumption in the USA was 171 pounds per person per year (United States Dept of Agriculture 1894). Taking into account the 10,000 miners who arrived in Atlin and the roughly ten-year period of the gold rush, wild meat consumption is projected to be approximately 1,710,000 pounds per year, and 17,100,000 pounds for the entire decade. The average quantity of usable meat from an adult caribou is approximately 100 pounds

(Alaska Department of Fish and Game 2023a). An adult moose will typically provide around 500 pounds of meat (Alaska Department of Fish and Game 2023b). Assuming a typical miner's diet was comprised of 50% caribou and 50% moose, the total number of animals killed during the gold rush would be around 85,500 caribou and 17,100 moose.

Much of the European appropriation of Kwáan managed lands and resources throughout the 18th and 19th centuries were based on the assumption that all of North America was Terra Nullius, (land belonging to no one). This legal fiction is difficult to entertain, considering the nuanced system of Tlingit kwáan ownership articulated by early European observers. By 1920 the Canadian state was working hard to eradicate Indigenous culture, language and spirituality in pursuit of creating a homogenized population. Children were removed from families and interred in residential schools run by various Christian sects. The Indian Act prevented Indigenous peoples from voting, hiring a lawyer, or participating in public education (Frideres and Gadacz 2012). Indigenous peoples across Canada were legally robbed of their traditional territories by the nascent state.

Archaeological background

Archaeology in the Taku basin

Taku River Tlingit territory spans a massive area of 3,072,469 hectares, yet very little archaeological research has been completed. To date, no specific regional chronologies tailored to the studied area have been developed in the realm of archaeology. However, studies conducted in the Yukon Territory and Alaska have proposed a cultural sequence spanning over 9,000 years in the northern region (Matthews 2000). Interpreting the ancient sequence in archaeological studies is fraught with difficulty, as early research in this field is filled with inconsistent nomenclature and methodologies and is generally insufficiently, if not very poorly, documented. Notably, archaeological sites between 2,000 and 10,000 years ago were characterized by the prevalence of microblade and microlithic stone tool technologies (Matthews 2000). Sites that are younger than 2,000 years generally do not contain microblades, yet they do contain a diverse range of projectile points that are organized into typologies. Clark has suggested an ancient

chronology for the area (Clark 1981). Pedestrian surveys rather than subsurface testing dominated the early research in the region. Diana French completed several research projects with the Atlin Indian Band in the early 1970's. Much of the early work completed in the early 1970's by Diana French was informed by the oral knowledge carried by Jackie Williams (Yáx góos), who was acting as a field assistant. Although Yáx góos was not acknowledged as an oral knowledge keeper in the field reports, he identified the locations of all of the major village sites in the Taku drainage (French 1976, 1974). The locations of all of the Taku Tlingit village sites, battles, spiritual places and harvesting areas were all passed down to Yáx góos orally by his grandfather (Williams 2006). French's work forms an integral part of the archaeological baseline for Atlin Lake and the Taku drainage (French 1975, 1993, 1974, 1976, 1988, 1978). Other archaeological studies in and/or adjacent to the study area include (Gates and Cassidy 1973; Greer 2007; Matthews 2000; McIntyre and McIntyre 1983; Murray and Hamilton 1987; Prager and Bussey 1995; Reeves 1978; Sneed 1974; Van Dyke 1979; Van Dyke and Reeves 1978).

Archaeology of the Cryosphere

Since 1997, there has been a boom in alpine ice patch archaeology conducted in the Yukon; there is also a well-established archaeological record of Indigenous ice patch hunting in the Northwest Territories (Andrews et al. 2012, 2012; Cruikshank 2005; Farnell et al. 2004; Greer et al. 2017; Greer and Strand 2012; McClaren and Gray 2020) . The cultural and archaeological value of alpine ice patches, both for modern Subarctic Indigenous communities and researchers, is immense (Alix et al. 2012; Hare et al. 2012). Ice patch archaeology globally has revealed a great deal about the biology, cultural practices, and climate of the early Holocene (Farnell et al. 2004). Due to the acidity of Subarctic soils, organic materials such as wood, bone, antler and leather are rarely preserved in an archaeological context (Ives 1990). Part of the significance of alpine ice patch archaeology is the incredible preservation of organic artifacts (particularly wooden objects), that simply would not have endured under varying taphonomic circumstances. Hundreds of arrows, atlatl darts, articles of clothing, and bone and antler artifacts have emerged from the ice patches in the Yukon (Alix et al. 2012; Farnell et al. 2004; Hare et al. 2012). These organic artifacts fill in many of the knowledge gaps that existed in Subarctic archaeology prior to the first ice patch discoveries in 1997 (Kuzyk et al. 1999. The extensive quantity of

archaeological materials recovered from ice patch sites in the Canadian Northwestern Subarctic point to a caribou hunting tradition that stretches back at least 9,000 years (Hare et al. 2012).

Although current populations have been greatly reduced, there are plentiful Indigenous oral histories that speak to the former abundance of alpine caribou in the southern Yukon and northern British Columbia. In 1997, a fragment of a hunting dart radiocarbon dated to 4360 BP± 50 years was discovered in an ice patch near Kusawa Lake in the Southern Yukon (Kuzyk et al. 1999). Dung was extremely abundant on the surface, and coring of the same patch revealed that fecal matter from caribou extended down 160cm from the surface (Kuzyk et al. 1999). Yet, at the time of the discovery there were only two woodland caribou herds: the Aishihik herd, which contained about 1500 animals, and the smaller Ibex herd, which contained about 450 animals (Farnell et al. 2004). The diminutive herd sizes at the time of this first archaeological find did not seem to square with the massive quantities of dung that were revealed by an exceptionally hot summer, preceded by a winter with low precipitation. The depth of dung would have required hundreds of thousands of caribou, if not more. While modern-day herds of woodland caribou are relatively small, the 'discovery' that pre-contact caribou populations were vast came as no surprise to Indigenous Elders and knowledge keepers (Greer and Strand 2012). In her discussions with ethnographer Julie Cruikshank, Tlingit and Athapascan elder Annie Ned spoke of caribou "blackening the ice" in her young adult life (Cruikshank 2005). Caribou fences were a successful Indigenous hunting strategy, and they were widely used in the northwestern subarctic (McClellan 2001). The living memory of large caribou populations exists, as do occasional remnants of hunting technologies, such as blinds, fences and cryogenic artifacts.

In stark contrast to the Yukon Territory and the Northwest Territories, there has been scant ice patch or alpine research completed in British Columbia to date, despite oral histories and ethnographic records that confirm longstanding relationships between Tlingit speaking peoples and caribou (Greer and Strand 2012; McClellan 2001; McClellan and Birckel 1990; Williams 2006; 2023). Chance finds, such as the discovery of the Kwäday Dän Ts'ìnchi (The Long Ago Person) in Champagne-Aishihik traditional territory, as well as an archaeological survey of the Kitsu Plateau near Mount Edziza, are some of the only examples of true ice patch archaeology in British Columbia (McClaren et al. 2020).

In Europe, there is a long history of ice patch archaeology, with the first monumental discoveries beginning early in the 20th century. Archaeologists have taken an active interest in the alpine cryosphere following the discovery of Ötzi the Iceman (5300-5100BP) in the Ötztal Alps on the Austrian-Italian border (Hafner 2012). More recently, ice patch surveys have been completed in Alaska, the northern Rocky Mountains, as well as in Yellowstone Park (Dixon et al. 2005; Lee and Puseman 2017; McClaren and Gray 2020). Perhaps more than anything else, ice patch archaeology has illuminated the close relationship between Indigenous peoples and alpine environments to archaeologists and scientists, although it is important to keep in mind that this information has never been lost in Indigenous communities. Even today, many desktop Cultural Resource Management predictive models are programmed to identify flat benches near water courses as the most likely sites of human occupation. While fresh water and flat land are certainly important factors for long term habitation, archaeology as a discipline has ascribed too little importance to the alpine. Prior to the discovery of Ötzi, the role of alpine environments in the lives of Neolithic peoples was thought to be negligible (Hafner 2012). In the entire Yukon Territory, there were only 2 archaeological sites recorded in the alpine, prior to the first archaeological discovery in 1997 (Hare et al. 2012; Murchie 2015). The past 20 years of research have changed that picture greatly in the Yukon and Northwest Territories, and now there is a much more nuanced understanding of Subarctic material culture. To a large extent, this research has taken place in partnership with First Nations governments and communities. It has been an opportunity for First Nations to engage and interpret their material culture and environmental history on their own terms (Greer and Strand 2012).

Theoretical approach

Oral Histories

Oral histories are, without a doubt, the most ancient form of knowledge transmission. Anthropologist Julie Cruikshank describes oral histories as “a coherent, open ended system for constructing and transmitting knowledge” adding that “oral history anchors the present in the past” (Cruikshank 1994:407–408). Oral histories, in their simplest form, are depictions of things that can be seen and experienced, such as the environment, material possessions, human actions

and occurrences (Martindale 2006). Laws, clan histories, supernatural events and origin stories are also frequently the subject of oral histories. These are details that are likely to be documented and conveyed with minimal changes between individuals and thus across cultural barriers of time and place.

In medieval Europe, oral histories, and those who recited them, occupied an honoured position in society (Miller 2011). Icelandic legal texts, such as *Njal's Saga* were recorded by oral historians (Miller 2011). At the time of its genesis, English common law was a performative, sensory, almost theatrical experience that is very far from the entrenched "black letter law" of the modern era, which almost exclusively relies on textual descriptions of the world (Miller 2011, introduction). Legal anthropologist Bruce Granville Miller points out in his book "Oral History on Trial" that

> The swearing of an oath in some instances included a kiss or a gesture. The anointing of a king, or the legal claim of a noble title, involved the smell and feel of a particular oil and the distribution and eating of food. The transfer of land required riding a horse to legally "see" and thereby acquire the land. Law itself was sometimes created in verse and intended to be sung. Perhaps most famously, the Bayeux Tapestry shows the powerful nobleman Harold Godwinson touching two reliquaries while promising to support the claim of William the Bastard (later William the Conqueror) to the English throne in the eleventh century. This form of oath swearing was recorded not in writing but rather in memory, or in this case, in textiles that could be understood by illiterates… (Miller 2011, introduction).

Over time, the English legal elites began to eradicate traces of the sensory from their legal system. Eventually, both oral transmitted law and the sensory aspects of the legal system were considered uncivilized and associated with fraud (Hibbitts 1992). Knowledge that has been passed from one person to another orally, came to be known as 'hearsay' under English common law, and came to be considered inadmissible as evidence. Johannes Gutenberg's invention of the printing press around 1440 had a huge impact on the proliferation of the printed word, which quickly spread to legal domains in Europe.

Like many other Indigenous societies in the northern hemisphere, Lingít speaking peoples use a system of oral transmission to convey history, law, stories and songs. The exclusion of oral evidence in legal settings puts Indigenous cultures at a significant disadvantage in terms of legal and property rights. Landmark Canadian court decisions such as *Delgamuukw v. British*

Columbia, [1997] 3 S.C.R. 1010 brought attention to the power imbalance wrought by the Canadian state's prior insistence that bibliographic testimony was the only valid form of evidence, with few exceptions. The Supreme Court findings were ahead of their time. Chief Justice Antonio Lamer wrote, "The laws of evidence must be adopted in order that this type of evidence can be accommodated and placed on an equal footing with the types of historical evidence that courts are familiar with, which largely consist of historical documents" (para 87). In the 26 years since the *Delgamuukw* decision, the legal transition from a state policy that considers oral histories to be hearsay to one that interfaces with oral histories in a nuanced manner, has been painstakingly slow. Despite the recognition that oral histories must be given the same weight as textual records by the highest courts in Canada, the move to affirm and implement the historical knowledge codified in Indigenous oral histories simply has not happened. In reference to *Delgamuukw*, legal anthropologist Dr. Andie Palmer pointed out that "Trial judges are still able to dismiss oral histories on the ground that they have not been made intelligible to participants in a Euro-Canadian judicial system" when the subject matter contained in the oral histories is not considered "common knowledge" (Palmer 2000:1047). What constitutes "common knowledge" is of course very much shaped by the Euro-Canadian education system, which prioritizes Western knowledge systems. Fundamental contrasts between Anglo-Canadian civilization and Aboriginal nations' worldviews, both broadly and in relation to the legal system, are at the heart of the issue.

While reflecting upon the difficulty of reconciling discordant worldviews, a theme that came up frequently in *Delgamuukw*, lawyer Kent McNeil wrote: "Part of the problem stems from the fact that Aboriginal peoples who seek adjudicated solutions to their Aboriginal claims are obliged to go to Canadian courts, which have to apply Canadian law. That law reflects the world views of Euro-Canadians, not of Aboriginal peoples. So no matter how sympathetic the judges may be and how willing they are to take account of Aboriginal perspectives, at the end of the day their decisions must be made in a manner that, in Chief Justice Lamer's words, "does not strain ' the Canadian legal and constitutional structure'" (Roness and McNeil 2000:73). The debate around the mutual incompatibility of Western ways of knowing versus Indigenous oral histories has not been confined to the courts; it is playing out in anthropology, history, and other academic disciplines.

As in the legal sphere, engagement with oral histories in the discipline of academic archaeology is polarized. The debate in anthropology, unsurprisingly, revolves around the question of whether Indigenous oral histories can be equivocated with Western scientific methods. In anthropology, there remains a lingering mistrust of oral histories as a locus of truth; there is still a "perception that [oral histories] lack credibility as evidence" (Markey 2014:302). This lingering mistrust of Indigenous oral histories stems from Western rationalist notions concerning objectivity, "legal" positivism and empiricism. It is important to scrutinize the philosophical underpinnings of Western science when setting foot on this fraught territory. The epistemological and philosophical backings of Western science which continue to fortify anthropology and the sciences contain biases and logical fallacies that must be identified before they can be properly addressed. In their paper "Limitations of the Western Scientific Worldview for the Study of Metaphysically Inclusive Peoples" Shipley and Williams argue that:

> ...contrary to the belief of many scientists, it [science] is not objective, universal, or acultural. These [assumptions] include 1) "realism," or "objectivism," which is the ontological assumption that an objective reality exists independent of our minds; 2) "empiricism," which is the epistemological assumption that at least some of the aspects of that objective reality can be observed and measured; 3) "positivism," which is the even stronger epistemological assumption that knowledge that is not derived from the scientific method is not objective and therefore cannot be validated, and 4) "inductivism," which is the further epistemological assumption that global propositions (i.e., theories) can be derived from local observations. Further, many scientists subscribe to radical positivism, or "scientism," which asserts that phenomena that do not meet the philosophical assumptions of Western science are simply not real. (Shipley and Williams 2019 pp. 289)

The assumptions embedded in science require serious scrutiny, especially given the generally unflinching dedication given to science by academic institutions. It is obvious that science carries a great deal of weight in academia. Feldhammer asserted that it is "only through the use (and praise) of the 'scientific method' [can] any study put forth a claim to intellectual legitimacy" (Feldhammer 1967:29–30). The social sciences, including anthropology, have made attempts at retaining objective neutrality so that they might be accepted as legitimate. Many social scientists' rigorous devotion to the Western scientific worldview, which recognizes only physical phenomena and explanations, inhibits the study and comprehension of Indigenous worldviews and histories, which include metaphysical phenomena and explanations. This has had a negative

influence on subjects such as anthropology and archaeology, particularly in the study of First Nations and other Indigenous peoples whose knowledge systems and worldviews make no or very few distinctions between the physical and metaphysical worlds (Shipley and Williams 2019).

The misconception that science is both objective, free of bias and acultural is one that is commonly held. The creation of knowledge can never be completely impartial or unbiased; rather, it inevitably shows the prejudices, knowledge gaps, and personal interests of the individuals, organizations, and communities who support, generate, and recognize it (Shipley and Williams 2019). Science is a product of human activities and, consequently, can only be as impartial as the human scientists who carry it out (Pierotti 2011; Turnbull 2000). The vast majority of archaeologists consider themselves consummate scholars. Yet archaeology, even more so than other academic disciplines, suffers from a chronic lack of direct engagement with the actual cultures that are being studied due to the constraints of scientific objectivism (Shipley and Williams 2019). It is this process of decontextualizing information and then recontextualizing it (this time with an added subset of both institutional and ethnocentric values) that once undergirded theories of scientific racism that were deployed by European nation states during the 19th and 20th centuries (Shipley and Williams 2019). Bruce Trigger pointed out that "[anthropology] is the only discipline that seeks to study human behavior and thought without having any direct contact with either. Instead, archaeologists must infer what they seek to study from the material remains of the past"(Trigger 1998:1). The irony in this statement and the implications for misinterpretation loom large.

Early in the 20th century, the "Father of Anthropology," Franz Boas, made great efforts to record oral histories of Indigenous peoples living on the West Coast of the Northern Hemisphere. While Boas' scholarship did much to unseat racist theories of European superiority such as phrenology and biological determinism, he still expressed skepticism when it came to treating oral histories as accurate historical records, despite the fact that he frequently relied upon them to form and support his own theories (Martindale 2006). In his essay "Some Problems with North American Archaeology" Boas asserted that it "is impossible to utilize historical traditions of the tribes for the construction of their [oral] history, because all of them are more or less of a mythical

character" (Boas 1902:4). In more modern times, advocates of the processual school of archaeology, with its emphasis on objectivity, scientific and quantitative methods, tend to eschew the complexities that oral histories often present to the researcher. Archaeologist Bruce Trigger asserted that "a realist epistemology, combined with a materialist view of reality, offers the most satisfactory general framework for…interpreting archaeological data (Trigger 1998:1). Similarly, anthropologists such as Robert McGee, Ronald Mason, Robert Dunnell and many others have indicated that Indigenous oral histories are essentially incompatible with western rationalist notions (Dunnell 1992; Mason 2000, 2006; McGhee 2008). Dunnell's "The Notion Site" (1992) asserted that incorporating oral histories into the practice of archaeology is problematic due to transmission errors. He suggested that oral traditions are prone to errors and changes throughout time, which makes them difficult to include in archaeological study. Because of the possibility of distortion, Dunnell argued that using oral traditions to support archaeological conclusions is not a legitimate strategy (Dunnell 1992).

Simultaneously acknowledging the potential descriptive value of oral histories, while cautioning against their use as a valid interpretive tool, Robert McGhee observed that while oral traditions can provide valuable perspectives on past human behaviour it is essential to approach them with caution and not rely on them solely as the main basis for archaeological interpretations. He asserted that archaeological investigations must be grounded in empirical evidence and be subject to robust verification processes (McGhee 1984). A central critique offered by Mason is the notion that, due to the errors which he believes are inherent in verbal transmission, it is impossible to transmit information from more distant times than a generation or two ago (Martindale 2006; Mason 2000, 2006). The implicit understanding in this line of reasoning is that oral histories describe much more recent events and phenomena, although even in their description of recent events, they should be approached with caution, or better yet avoided altogether.

In a subsequent article, McGhee articulated that oral histories should "be of only peripheral interest" to archaeologists, and he stated that they should be considered on par with "religious faith, or the imaginative use of other forms of information" (McGhee 2008:580). Ronald Mason drew comparisons between oral histories and religious faith, adding that they have "Alice-in-

Wonderland" like qualities (Mason 2000:263). The acknowledgement that oral histories contain religious and spiritual themes is in this case, not a desirable quality for the materialist. The epistemological positions of Mason, Dunnell, McGhee and those that follow their intellectual lineage is simply a recapitulation of 'normal science', and an affirmation that Indigenous and Western ways of knowing cannot interface. The tacit underpinning being that empirical methods are superior, and that oral histories are simply not up to the task of accurately rendering the past in a manner that is equivalent to the written word.

Since there are no materialist explanations for the metaphysical beings and events that frequently populate oral histories, (including events that do not match up with the popular scientific theories of the day: see page 47 for more on this topic), the oral history itself must be removed or significantly downgraded to an ethnographic curio. Unfortunately, a strictly materialist understanding of reality is fundamentally at odds with Indigenous ways of knowing, which is comprehensive and holistic, (Munroe et al. 2013) and do not differentiate between the metaphysical and the physical, nor do they highlight differences between philosophy, law, science or religion (Berkes 2017; Pierotti 2011; Shipley and Williams 2019; Tsosie 2012). While concepts like subject and object, nature and culture and notions of the sacred and profane are deeply entrenched in western thought and politics, these highly delineated concepts scarcely exist in Indigenous epistemologies. Ideas of the sacred are much more integrated with the personal and the physical world (McGregor 2012).

The scientific method historically has not been presented as an approach to knowledge, but rather as a set of monolithic universal principles that supersede culture and values. Scientific education was imposed on the Indigenous peoples of North America via the residential school system, and attempts were made by invading European powers to eradicate traditional ways of knowing and spiritual traditions (Munroe et al. 2013). Far from an acultural force, science and the social sciences remain harmful colonial forces that continue to shape provincial and federal heritage policy and law. In her analysis of science education curriculum in Papua New Guinea, Ann Ryan wrote: "From the universalist position there is an assumption of authority of Western 'truths' over other cultural ways of knowing and understanding. This leads to censoring any understandings outside of the Western worldview" (Ryan 2008:674). A direct reaction to the

colonial imposition of Western 'truths' on Indigenous peoples has manifested in the growing number of voices calling for the decolonization of the sciences and academia as a whole (Shipley and Williams 2019). Alternative ways of knowing and thinking about the past must be identified in order to facilitate this shift. Speaking on the lack of attention given to Indigenous oral histories, and the need for a theoretical framework for integrating these knowledge systems, Piikani archaeologist Eldon Yellowhorn remarked:

> If the Indian past remains unknown, and archaeological data is the accepted standard for knowing about it, it follows that a scientific perspective will be promoted as the only legitimate version of antiquity. And, by extension, if traditional narratives are kept in a subordinate position, oral traditions that relate cultural history will continue to be regarded with skepticism as hearsay or rumour. This history/pre-history dichotomy is problematic because Indian historical identity is made contingent on a European presence, while at the same time periodization is a standard tool of historians and archaeologists. Therefore, internalist archaeology can apply similar techniques to periodization so that antiquity will mean more than just the time before Europeans. (2002:21)

In anthropology, the move to decolonize academia has led to the emergence of the subfield of Indigenous archaeology, or internalist archaeology, as Yellowhorn terms the emerging discipline. Indigenous archaeology, as defined by Métis archaeologist Kisha Supernant is "... a set of approaches to archaeology with, by and for Indigenous peoples. In particular, Indigenous archaeology is practised in colonial nations such as Canada, the United States, Australia and New Zealand. Indigenous archaeology emerged out of Indigenous peoples voicing their concerns about non Indigenous archaeologists studying Indigenous pasts without engaging with Indigenous peoples in the present….Together, they work to understand the past in ways that consider multiple perspectives and integrate Indigenous knowledge into archaeological interpretation" (Supernant 2021). The ideas articulated by Yellowhorn and Supernant form an important aspect of my theoretical approach. My research paradigm is not focused on assessing the accuracy or validity of oral histories, or 'validating' oral histories through archaeological data analysis. Instead, I am allowing the oral histories to speak for themselves with the understanding that they are accurate historical documents. The data codified in oral histories (placenames, harvesting areas, village sites, etc.) not only determined site selection, but also influenced the interpretation of each site.

On the other side of the anthropological debate surrounding oral histories, many anthropologists have employed compelling arguments in favor of engaging with Indigenous oral histories in the pursuit of obtaining a more enriched and multifaceted understanding of the past (Bacon 1993; Bahr et al. 1994; Begay and Roberts 1996; Benn 1989; Echo-Hawk 1997, 2000; Fewkes 1898; Haakanson 2000; Hall 1983, 1997; Henning 1993; Levi 1988; Mann and Fields 1997; Martindale 2006; Moodie et al. 1992; Patterson-Rudolph 1997; Pendergast and Meighan 1959; Schlesier 1987; Sheppard 1998; Strong 1934; Teague 1993; Vehik 1993).

In his analysis of an excavation of stone enclosure on top of a hill in Manchester, Tennessee, archaeologist Willard Bacon engaged with Cherokee oral histories in order to shape his interpretation of the site. Bacon described how stone shelters were used by various characters in Cherokee cosmology when preparing to meet with supernatural entities, such as immortal beings and horned serpents (Bacon 1993). He concludes that the structure was "built to control meetings with supernatural entities. The exposure of the local Middle Woodland population to a set of mythological beliefs that associated unique topographical features with supernatural entities was probably the principal factor in the decision to construct a Middle Woodland enclosure at this location" (Bacon 1993:245).

In their paper "A Sign in the Sky: Dating the League of the Haudenosaunee" Barbara Mann and Jerry Fields explored the hotly contested founding of the famous Haudenosaunee League. Non Indigenous scholars previously dated the founding of the League to 1536, and associated the founding with an eclipse in the same year (Mann and Fields 1997). After engaging in significant dialog with Iroquois Keepers and oral historians, Mann and Fields concluded that the origin of the League of the Haudenosaunee actually took place in 1142, or 394 years earlier than the dates proposed by white academics. Much of the prior dialog around the formation of the League was centered on various Indigenous communities forming political organizations in response to colonial pressures. This narrative suggests that political organization was somehow contingent on a European presence; these much earlier dates of establishment carried by the Keepers affirm that just the opposite is true.

In her analysis of Dhegiha Sioux origins, Susan Vehik acknowledges a reality familiar to many Indigenous communities. She remarks, “Most of the archaeological proposals regarding Dhegihan origins conflict with Dhegihan oral histories. As a result, they require substantial re-interpretation or dismissal of the oral histories”(Vehik 1993:231). Vehik’s research revealed that many of the archaeological proposals were more complex but did not offer a more compelling alternative to pre-existing Dhegia Sioux origin stories. Conversely, oral histories between Dhegihan communities possessed a great degree of similarity concerning origin points. The finding of this paper shows that there was no compelling reason to dismiss oral histories in favour of more complex academic conclusions.

Countering the assertion that oral histories describe relatively modern events, Pawnee archaeologist and historian Rodger Echo-Hawk has argued convincingly that oral histories often contain information that describe events that took place in the previous millennia (Echo-Hawk 2000). He asserts that a huge variety of astronomical and geological events are encoded in oral histories, stretching back to the Pleistocene. These events include: “Arctic Circle patterns of solar movements, the observed transition from Arctic Circle to lower latitude diurnal/nocturnal cycles, descriptions of permafrost thawing/freezing, Pleistocene weather patterns, the existence of European and American glacial ice sheets, sea level changes associated with ice sheet expansion and melting, glacial lakes, the onset of Holocene seasonality, and human interaction with extinct megafauna”(Echo-Hawk 2000:273). While the durability of oral histories has been minimized by some anthropologists, Echo Hawk’s work draws attention to the tenacity of oral literature. He asserts that “little or no support exists in scholarship that sustains [the] favored presumption on the limits of verbal durability, whether the presumed limit is set at 100 years or 10,000 years beyond the living memory of firsthand observers” (Echo-Hawk 2000:273). Compelling recollections of ancient events such as human engagement with Pleistocene megafauna, continental ice sheets or sea level change have frequently been independently corroborated by the sciences.

In their analysis of Australian Aboriginal oral histories, Sharpe and Tunbridge observed detailed geological and climatic information that can be dated between 10,000 and 13,000 years ago, such as volcanic eruptions and sea level changes (1997). Prior to 10,000 years ago, lower sea levels

joined the islands of Tasmania, Australia, New Guinea and the Aru Islands in a paleo continent known as Sahul (Groves 1996; Reid et al. 2014). Oral histories about these now submerged land masses not only exist, but Aboriginal groups have retained detailed territorial maps of land masses which were once hunting grounds, but are now part of the seabed (Sharpe and Tunbridge 1997). It is also worth noting that the Aboriginal accounts of sea level change were expressed in 1858, and scientific theories of sea level change were not accepted until the 20th century (Sharpe and Tunbridge 1997). In North America, similar accounts exist in oral literature. Approximately 1300 Years Before Present (YBP), the White River volcano in Alaska erupted. This eruption coated much of the northwestern subarctic in 5-50 cm of volcanic tephra, making much of the region uninhabitable (Kristensen et al. 2020).This event was a major disruption, as tephra is toxic to aquatic life as well as large ungulates, and it was also a major driver that pushed Athapascan peoples south. Northern Athapascan peoples have accurately recorded this event in their oral histories (Moodie et al. 1992). These are just a few examples among many. Oral histories not only fill in many of the gaps that archaeology on its own cannot answer. After centuries of imposed colonial typologies and scientific theories that were largely divorced from the living histories of descendant communities, oral histories also act as an important counterpoint to hegemonic Eurocentric perspectives (Martindale 2006). A critical takeaway is that oral histories have been, and continue to be empirically tested successfully (Yellowhorn 2002).

My research epistemology both engages the knowledge contained in oral histories, while employing the valuable tools and techniques of archaeology that often add detail that is absent in oral histories. Together, these two ways of knowing reveal more nuances about human history than either system could alone. Additionally, oral histories provide a platform for interpreting the past that is often synchronous with the archaeological record (Cruikshank 2005; Echo-Hawk 1997; Martindale 2006; Miller 2011; Teague 1993). While written accounts and European ethnographic information certainly play an important role in the construction of the past, exclusive reliance on these knowledge streams will inevitably lead researchers to general, pan-Indigenous interpretations. There are for example, many Indigenous communities that have very scant representation in the ethnographic literature, including the T'aaku Kwáan. Ethnography and oral history taken together provide important context. A perpetuation of Eurocentric typologies and theories that do not consider Indigenous people's histories can only reproduce

colonial epistemologies (Steeves 2021). My research will add to the growing body of literature that recognizes the crucial role of oral histories in the field of archaeology.

As a non-Indigenous archaeologist, my understanding of the nuances of oral histories is by no means complete. Part of the difficulty in engaging with oral histories is due to the various levels of meaning, and also the different categories of oral histories (Echo-Hawk 2000; Martindale 2006). Oral histories concern many broad topics, including origin stories, clan protocols, respectful engagement with non-human beings, historical accounts, and many others. Since these categories are rarely made explicit, some interpretive effort is required. This lack of explicit classification has undoubtedly contributed to the institutional mistrust of oral histories, which is still prevalent in archaeology. Western history contains important assumptions about the nature of time that are worth drawing attention to. Firstly, they assume that time is chronological and linear, and that we observe the past in the present. Anthropology on the whole draws upon a linear chronology in the reconstruction of the distant past. Legendary time scales and notions of cyclical time are a feature of many oral histories (Cove 1987). My focus was primarily Lingít toponyms and place names, and the published histories that are associated with them. The oral histories that I studied appeared to describe chronological events, such as wars and migrations. Taking this approach to understanding a cultural landscape is arguably the most basic form of engagement with oral histories, one that has a low potential for misinterpretation.

Oral Histories of the T'aaku Kwáan

This study is focused on recognizing the oral literature of the T'aaku Kwáan, specifically in relation to alpine spaces. While there will be occasional mentions of the other Lingít speaking communities, the foundation of this study will be the oral histories of the T'aaku Kwáan. This approach is not meant to disregard the histories of other communities, nor exclude other perspectives. I am putting my efforts into those particular, personally identified places seen and experienced by people who, in living memory and/or through meticulous documentation by those who know the language well and have spent time on the land. By depending on these works (and the knowledge and experience that made them possible) in my site selection, I have attempted to remain as close as possible to the original meaning and intent of the histories themselves.

Many readers familiar with Tlingit oral literature will be very conversant with the work of Nora and Richard Dauenhauer. During my research, I read their monumental book *Haa Shuka, Our Ancestors: Tlingit Oral Narratives* (1987) but found that it contained only a few brief mentions of Taku, which didn't advance my research objectives directly. In the biography of Tom Peter, there is a brief description of his T'aaku Kwáan ancestors (Dauenhauer and Dauenhauer 1987:469). There is a mention of Taku in the story "Naatsilanei," told by J.B. Fawcett, but it is also brief, and it is primarily focused on many other Tlingit communities (Dauenhauer and Dauenhauer 1987:135).

Haa Kusteeyi: Our Culture, Tlingit Life Stories (1994) is also a very interesting text, and it does a fantastic job of describing the lifestyles of Tlingit folks in southeast Alaska in the last century. There are references to the Taku River, but they are almost all about fishing in the 1950's -1970's and forward in time from there. There are also individuals mentioned who have T'aaku Kwáan ancestry, such as Tom Peters (p.552) and Snook (pp.479) but the accounts are very specific to individuals, and I did not find much material that would be useful to testing my hypothesis of oral knowledge of alpine land use. I was primarily interested in precontact alpine land use in the study area or else ethnographic information on the T'aaku Kwáan, which is quite scarce. There is plentiful information in the Dauenhauer's work about communities in Alaska by contrast. There are references in my ethnography section from *Anóoshi Lingít Aaní Ká: Russians in Tlingit America* (2008) as there are some good first person, population statistics about Taku as well as general background information on the Russian American Company period.

Oral historic source material referenced as a primary source in this thesis originates from three manuscripts: *Gagiwdul.at: Brought Forth to Reconfirm. The Legacy of a Taku River Tlingit Clan* (1993) written by elder Elizabeth Nyman (Sédayá*)* and Jeff Leer, *Łingit Kusteeyí: What my Grandfather taught me* (2006) written by Jackie Williams (Yáx góos), and *Yáx Góoś: The Cloud On The Face Of The Mountain*, (2023) by the same author. Additional oral historic information, in the form of Lingít placenames and descriptions have been collected and collated on the www.trt.geolive.ca website, and these sources will also be referenced. The knowledge centralized in the trt.geolive website contains the words of dozens of Taku River Tlingit elders and knowledge keepers, including Mary Anderson, Antonia Jack, Elizabeth Nyman and Jackie

Williams. Additional information was gathered from Thomas Thornton's book *Haa Leelk'w Has Aani Saax'u / Our Grandparents' Names on the Land* (2012) which contains thousands of Lingít placenames, and is the result of decades of interviews. This study is not exhaustive, as no attempt is being made to address all published Tlingit oral histories including (but not limited to) the work of the Dauenhauers.

There are, of course, many challenges that arise from attempting to translate the inherently sensory experience of listening to a person share a story, with the comparatively unengaging format of reading words from a page. Subtle changes in inflection are lost, as are physical gestures meant to enhance the experience of the story. Oral histories are intimately tied to place, and knowledge of the land is also a requirement for understanding both the history, and the significance of place. In the foreword of Elizabeth Nyman's book, she expressed the deep connection between narrative and place: "If only you were taken by boat along the Taku River, you could write the whole story down in a book" (Nyman et al. 1993; introduction). Landscapes and the placenames associated with them are frequently used as mnemonic devices in oral cultures, as well as providing narrative structure (Cruikshank 1990; Rosaldo 1980). Both Jackie William's and his mother Elizabeth Nyman's oral histories depict detailed mental maps of Lingít Aaní, complete with dozens of Lingít placenames that anchor their narratives to specific geographic locations (see Figure 5). Placenames act as mnemonic devices, indicating resource gathering sites while illustrating paradigmatic examples of human and non-human relationships (Cruikshank 1994; Yellowhorn 2002). They represent locations where edible fern roots could be found, caribou came to lick minerals, or reference areas where ancient conflicts were resolved (trt.geolive.ca, 2021).

Introducing the Oral Historians

Sèdayà (Elizabeth Nyman) was born to parents Kudagán and Nêxh'w in 1915. She is of the Yanyèdi clan of the Wolf moiety on her mother's side, and on her father's side she is Khàch.ádi yádi of the Raven moiety (Nyman et al. 1993). Much of her youth was spent on the Taku River, although she was not unaffected by the outside world, or by the colonial policies of the Canadian state. She was a fluent Tlingit speaker, and she eventually cowrote a collection of oral histories and personal life experiences in the book *Gagiwdul.at: Brought Forth to Reconfirm the Legacy*

of a Taku River Tlingit Clan with Jeff Leer, a Tlingit linguist. Sèdayà began to put her oral knowledge down on paper in the late 1970's and early 1980's.

Jack (or Jackie as he was later known) Williams was Sèdayà's firstborn son. Soon after Jackie was born, he was honored with the names Xûts and Jigê, which previously belonged to the former Yanyédi Clan Leader, known in English as Taku Jack (Nyman et al. 1993). In the introduction to *Gagiwdul.at: Brought Forth to Reconfirm the Legacy of a Taku River Tlingit Clan*, Jeff Leer added the following commentary:

> Soon after Jack Williams was born, Elizabeth took the baby to an old man named Gêy, who lived in Juneau and had asked to see him. In commemoration of this event, Gêy gave Elizabeth the name Gágiwdul.àt, which is a shortened version of the sentence "gági wdudli.àt" meaning 'they were brought forth.' As Elizabeth recalls it, Gêy said, "Ha dê dàk áyá at shundayfkh. Axh îk' Jigê du ádi áwé dàk wududli.át. A kàxh áwé kkhwasa: Gágiwdul.àt á." This translates, 'Now [Jigê, Taku Jim] is bringing out the possessions [he had when he was alive] to be distributed. My brother Jigê's things have been brought out. I will give [Sèdayà] a name in honor of this: Gágiwdul.àt.' She explains that after the old Jigê's death, his possessions were brought out in armloads so that they formed a great pile from which his clansmen-his nephews, brothers, and grandsons - could claim what they wanted. This was both literally and figuratively a passing on of the heritage of the Yanyèdi clan to the new generation. Gêy used this event as a metaphor to express his feelings about the birth of the new Jigê. He had been "brought forth" to reconfirm the legacy of the old Jigê, who had in turn inherited his name and legacy from the Jigê before him, and so on back to the beginning of the clan (Nyman et al. 1993 - introduction).

It would appear that the prophetic words of Gêy came true, as Jigê (Jackie Williams), who later inherited his grandfather's name, Yáx góos' carried on the oral traditions of his ancestors, just as his mother Sèdayà had before him.

While growing up on the Taku River, Jackie Williams' grandfather, Billy Williams, passed his oral histories down to Jackie. When Jackie became the Yanyeidí clan leader, from approximately 1956 to 2013, he took the name Yáx góos' from his grandfather (Williams 2006). The meaning of "Yáx góos'" is "cloud on the face of the mountain," and the phrase refers to Yayuwaa mountain, which is located at the confluence of Naak'ina.áa Héeni (Nakina River) and the Héen Tlein (Inklin River) (Taku River Tlingit First Nation 2013; Williams 2006:5). Yayuwaa Hít was also one of the largest T'aaku Kwáan villages and an important Yanyeidí clan house (Swanton 1909)

In the introduction to *Lingít Kusteeyí: What my Grandfather taught me* Jackie introduced himself:

> Dear reader, my names is Yáx góos' (Jackie Williams). This book is part of the history of the Taku River Tlingit people that my grandfather Billy Williams taught me in the oral tradition of our people starting in the 1930's. My grandfather, whose Tlingit name was Yáx góos', was the Yanyeidí Clan Leader for the Taku River Tlingit First Nation when he taught me this history…With the help of some associates, I have worked on writing this story for over eight years. My grandfather taught me how important it was to tell this story exactly the way he taught it to me, without changing it, and I have tried very hard to be true to this teaching.
>
> In the Tlingit tradition many of our stories teach us the importance of having respect for the land, the animals and for each other. For example, my grandfather taught me that the Naak'ina.áa Héeni (Nakina River) and L'óox'u Héeni (Sloko River) come together in the same way the white people and native people should come together. My grandfather told me the darker river (Nakina) was me (Tlingit) and the Sloko represented the white brothers. This is what the Nakina and Sloko coming together represent. This is a good example of how Mother Earth can teach us. She shows us how we should work together.
>
> The Creator made this land and the animals for us and we need to look after these in the right way. The many waters flowing into the Taku River are like blood veins in our body all flowing into our heart. In this way we are all linked to the land. We need to believe in this so we can save our land; when we don't believe in our Tlingit culture it hurts us and it hurts our land. It is very important that as Tlingit people we believe in our traditional ways and our clan system of government.
> I am providing this book to people in the hopes that it will help them learn and understand our history and appreciate how important it is for us all to come back to our traditional ways and cultural practices (Williams 2006:2).

Jackie's grandfather instructed him in the oral histories of his people at T'á Héen T'ei.ée ("King Salmon River Flats), near the site of the old Xóots Hídi clan house ("Grizzly Bear House").

MAP 1

Site	Description
1	Yayuwaa Mountain
2	Flats of the *T'á Héen T'ei.ée* ("King Salmon River Flats")
3	*Xóots Hídi* ("the Grizzly Bear House")
8	*Yéil Héeni* ("crow creek")
9	Village of *Héen Tlein* ("big water")
11	Village of *Yéil Táayi* ("crow garden")
12	Village at Tulsequah River
13	Village at Canyon Island
14	Big smokehouses on the Taku River below the Nakina and Inklin junction
15	Site of the woman's impalement
16	Grave of the impaled woman
17	*Latseeni Sinwaa Shaa Héeni* ("Powerful Limestone Mountain Water")
18	*Sinwaa du dachxán* ("limestone grandchild")
20	*L'el Tóoli* ("Yellow Bluff)
21	*S'oow Héeni* ("blue water)
22	Graveyard point
23	Where the big salmon the Indian doctor predicted camped on the sixth night
24	*Yóo gooch áx' woogaaxi yé* ("the wolf's rock" or the "Cry Wolf")
26	Limestone hill named after *Ltaaduteen's* mother
27	*Yatseeneit Hídi* ("female grizzly bear house")
28	Russian fort
29	Inklin Canyon

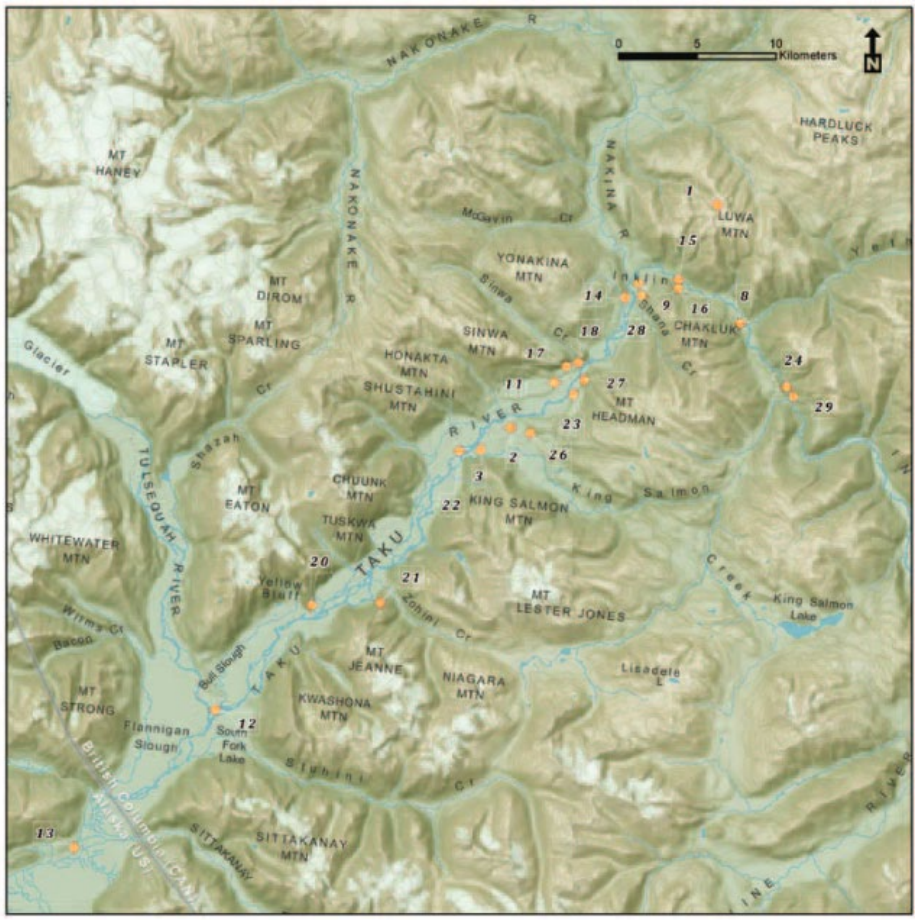

Fig. 9 Key places in *Lingít Kusteeyí: What my Grandfather taught me* (Williams 2006:24)

Each day Jackie and his grandfather would sit under an old *latseeni aas* ("powerful tree"), and Jackie would make tea, and they would toast dry fish on a fire. Billy Willaims said to his grandson: "I'm going to tell you the story of the history of the Taku and where the smokehouses, the villages and the markers were, and after some time I will ask you to tell the story back to me. Remember, there used to be a lot of people living on the Taku, not just a few. You learning this story is like a fish swimming back to where it was born. With this story you will be swimming back to your ancestor's ways" (Williams 2006:5). Jackie would recite the histories of his ancestors to his grandfather, and his grandfather would correct him if he made any mistakes. Learning the histories took many years, and each time that Jackie's grandfather Billy shared an oral history, he said "Don't tell it the way you want to, tell it the way I'm telling you" (Williams 2006:5). Jackie kept practicing until he could recite every history correctly.

Both Sèdayà and her son Yáx góos recorded their oral histories out of a desire to share their culture and history with younger generations and to revive the cultural traditions of their ancestors. They were incredible storytellers and knowledge keepers, and they will be greatly missed by all who knew them. Gunalchéesh.

Community Engaged Research

Prior to the last two decades, Indigenous voices have largely been absent in the construction of archaeological sites and theory. This is despite the obvious fact that virtually all archaeological sites (any site or feature that is pre-1846) in B.C. are Indigenous and are thus ancestral sites. Naturally, Indigenous people are concerned with how their pasts are being constructed, as there are clear implications for land claims and other land use planning processes (Yellowhorn 2002). Even today, while 'engagement' with First Nations is a permit requirement for archaeologists working in British Columbia, an Indigenous representative on an archaeological project would end up digging holes and sifting soil, while the final interpretations would be left to the white permit holder. The Provincially regulated Cultural Resource Management space is especially bad at providing any opportunities for acknowledging and affirming Indigenous perspectives. Piikani archaeologist Eldon Yellowhorn has noted:

> The archaeological profession has been slow to acknowledge that Indians had legitimate interests in their work. The more common pattern was to dismiss Indian protests as the actions of a few malcontents who did not represent their communities. This culturally induced isolation from Indians seriously distorted professional Interpretations of archaeological data, so that the formulation of what passed as theory was basically a reiteration of nineteenth-century stereotypes that portrayed Indian cultures as unprogressive (Yellowhorn 2002: 9).

In the late 1990's, archaeologists began to acknowledge the mounting concerns that Indigenous communities were raising about the lack of meaningful dialogue that had become commonplace. In both Canada and the United States, books and journal articles that outlined the perspectives and common concerns of both Indigenous peoples as well as archaeologists were published (Anyon 1997; Nicholas 1997). Although the movement towards a more equitable practice has had some benefits for Indigenous communities, significant barriers remain. A perceived issue, as

discussed in the ‘Theoretical Approach’ section, is the frequent friction between Indigenous cosmologies and oral histories, and the methods of normal science.

Indigenous archaeology includes a pedagogical framework as well as methods and technical tools that can be used to benefit modern-day Indigenous communities. Indigenous archaeology is an epistemological viewpoint that views the discipline's colonial history as an impediment to archaeological academic orthodoxy in relation to non-Indigenous archaeologists' interpretations of Indigenous history (Markey 2014; Martindale 2014; Supernant 2021) Instead, Indigenous archaeology refocuses archaeological inquiry on the heritage concerns of descendant communities, aided by an effort to comprehend the Indigenous past through attention to critical differences in the ways in which knowledge is produced within Indigenous committees and the archaeological establishment. As there is a growing movement to ‘decolonize’ archaeology, descendant communities have renewed interest in why, when, and how archaeology is conducted on their traditional territories.

Direct Historical Approach

Contextualizing cultural background, which provides key information on why and how spaces were (and in many cases continue to be) engaged with and inhabited, is as important as collecting data about individual archaeological sites. As Sven Haakanson points out “simply describing the artifacts and providing their dates does not inform us about the culture that produced the objects” (Haakanson 2000:4). The practice of engaging and incorporating non-empirical information, such as oral histories, into the practice of archaeology is usually referred to as ethnoarchaeology (Haakenson 2000). Ethnoarchaeology as a practice seeks to engage with both empirical and non-empirical sources, and, in doing so, provides a fuller understanding of patterns and processes that are unique to distinct cultural or historical settings. This approach is just as focused on how and why archaeological sites were created and used as the material traces themselves. Information about historical events, social organization, and cultural practices strengthens our understanding of the past by offering a more nuanced understanding than archaeological features or artifacts could ever produce. Oral histories can provide an Indigenous perspective in a field that has been dominated by Euro-Canadian/American perspectives for decades and, to a large extent, still is. Indigenous ways of knowing and empirical methods need

not be diametrically opposed. It does not contradict science or mythology to present the origin myth as a study of landscape and social geography, but interpreting oral narratives through a scientific lens necessarily modernizes the account (Yellowhorn 2002). People have always used myths and stories to cope with and understand the outside world. The methodologies of Indigenous archaeology/ethnoarchaeology offer a contemporary solution that enables us to understand the meanings concealed in oral narratives.

Archaeological Methods

There are few access points to the high alpine cirques and ridges in the study area in northwestern British Columbia. There are not many roads or trails. Most of the alpine ice patches would take several days to reach on foot. The study area's mountain elevations range from 1400 to 2300 meters above sea level, while valleys adjacent to patches are typically 600-900 meters above sea level. Archaeological surveys must take place after all the seasonal snow has melted, but before new snow falls. Since the timeframe for investigating cryogenic sites is so short, sites will be accessed via helicopter. The typical window for this type of research is limited to 2-3 weeks at the end of August and into the first week of September.

Site selection will be guided by oral histories that pertain to caribou hunting, as well as alpine harvesting and gathering places. The Yukon Government Heritage Branch's ArcGIS model will also be used to locate potential ice patches. SPOT satellite imagery with a resolution of 1.5 meters will be used to assess potential ice patches for signs of caribou dung/usage. Individual ice patches will be accessed via helicopter for signs of caribou dung and surveyed on foot with informal transects. Ice patches, as well as immediately adjacent areas that have recently ablated, will be surveyed. Organic and lithic artifacts will be photographed in situ and mapped using a Garmin 64s GPS. Notes will be taken in the field. Whenever possible, video documentation of sites and artifacts will also take place, as these sites are unique and rapidly changing. When weather is permitting, alpine ice patches will be mapped and modelled using a DJI Inspire II drone. When sites are identified, they will be recorded per British Columbia Archaeology Branch standards. The Taku River Tlingit First Nation will temporarily house artifacts in the government buildings in Atlin, B.C. before they are interred in the Royal British Columbia Museum.

The entire project area was examined by a survey team consisting of an TRT Elder/ knowledge keeper (Terry Jack, Barb Dawson), two archaeologists (Aaron Blake Evans of Wolf and Crow Research and myself), a TRT Land Guardian (Trevor Williams) and frequently a TRT youth (Luke Westley, Brittany Westley, Max Westley, Logan Law). We conducted a systematic ground inspection, inspecting as many ice patch exposures and alpine use areas as was practicable given environmental factors. The surveyors were spaced at intervals of 5m in areas with high archaeological potential and 10–15 m apart in areas with lower potential. On large ice patches, we prioritized surveying both the bottom edge and the top, as well as any places where the patch had recently ablated, and bare rock was evident. Measures were taken to identify Culturally Modified Trees in both standing and fallen trees in subalpine areas.

To complement the surface inventory, small diameter shovel tests were strategically placed based on judgment on rare occasions. Shovel tests were dug to a depth of 35–40 cm in width per side, to sterile C Horizon soil or bedrock. Soils and sediments were passed through a ¼" or 6mm screen for signs of cultural material. The presence of existing cultural exposures or perceived potential determined the frequency of subsurface testing. In addition, a 1x1 m2 evaluative unit was used at a single site. Data was recorded at 10 cm depth intervals, relative to a central UTM hub.

Site selection criteria

- The existence of oral histories or Lingít toponyms, that contain pertinent place-based knowledge about an alpine or subalpine area
- Living knowledge holders indicate that an area is/was an important hunting location
- A survey of the TRTFN archival material reveals the significance of a specific location
- Caribou GPS collar data from the Atlin, Carcross, Laberge, and Ibex herds
- Caribou dung was visible in SPOT satellite imagery, or upon visual inspection
- Area was modelled, and it had an appropriate slope angle, elevation, and aspect

Artifact collection and transportation methods

- Stable wood and bone objects are placed inside bags as long as the length of the bag permits the item to rest in a seam. The bag's tag has the site number, stop numbers, and GPS location inscribed on it.
- Multi-component artifacts are placed in microfoam beds at the top and bottom of plastic boxes.
- Artifacts that are too long to fit in a bag or box are attached to peg board using three secure hooks (at strong wooden shaft points). By padding the wood with foam pipe insulation and then loosely fastening it with plastic zip ties, the artifact is elevated off the hardboard at connection sites. Plastic has been placed over any biological components of the hafting.
- The underlying rocks will be used to extract any frozen or soaked hide objects from their original position.

Ice Patches as Caribou Refugia

Fig. 10. Watsíx (caribou) on an ice patch on Jánwu X'áat'I (Mountain Goat Island). Photo by author

Caribou (*Watsíx,* reindeer, *Rangifer tarandus*) are extremely temperature sensitive, and will seek out ice patches for thermoregulation (Ion et al. 1989) While altitude and the associated high winds play a role in reducing the impact of parasitic insects, ice patches are also essential in reducing predation pressures on caribou (Downes et al. 1986). Botflies and warbleflies lay their eggs in the mucous membranes around the nose and eyes of the caribou, as well as in the hair of the abdomen. These larvae can number in the hundreds, and when hatched, they bore through the hide of the animal. These parasitic insects are known to drive caribou crazy, sending them into a panicked gallop across the tundra, or straight into the frigid waters of the Arctic Ocean. High predation pressures characteristic of lower elevations force caribou to move much more frequently, consequently resting and feeding less (Downes et al. 1986). This high-output activity results in more net energy expenditure, and a lower net caloric intake. Higher predation pressures by mosquitoes and oestrids may lead to lower survivorship in the long term (Ion et al. 1989). Ambient air temperature on ice patches is consistently 3 degrees cooler than in nearby alpine terrain; the combination of lower air temperatures and the higher winds associated with exposed alpine environments reduce insect harassment (Ion et al. 1989). Ice patches play a critical role in the life cycle of caribou, and for this reason, they were also critical in the lives of the Subarctic Indigenous peoples who hunted near them.

While in northern British Columbia and the southern Yukon, moose have replaced caribou as the main subsistence ungulate for First Nations, there is still a deep cultural connection to these animals, and there are significant measures in place to preserve existing caribou herds (Greer and Strand 2012). The Taku River Tlingit First Nation, together with Teslin Tlingit Council and Carcross-Tagish First Nation, have imposed a voluntary moratorium on caribou hunting for their citizens. Caribou populations have been declining for decades, and the disappearance of remaining ice patches will only exacerbate the current environmental pressures. Andrews, McKay and the Shúhtagot'ine Elders noted in their archaeological survey of the Selwyn mountains in the Northwest Territories that caribou will return to the sites of ice patches that are completely ablated, indicating their critical role in seasonal migration and pest mitigation (Andrews et al. 2012). The exact reasons for the population decline are not entirely clear, but anthropogenic impacts have undoubtedly played a large role (Festa-Bianchet et al. 2011; Hebblewhite et al. 2010; Serrouya and Wittmer 2010). Caribou are not alone in their struggle to

exist. The glaciers and ice patches that they rely upon for survival are an endangered species in their own right. This fact is at odds with Canada's unmitigated extraction and burning of fossil fuels.

Ice Patch Formation and Climate Change Impacts

Ice patches themselves predominantly form in semi-arid alpine environments at an altitude of between 1,524 m (5,000 feet) and 2,134 m (7,000 feet), on north-facing slopes, as they are exposed to much less solar radiation (Andrews et al. 2012). While glaciers move great distances annually, ice patches do not have sufficient mass to move (Farnell et al. 2004). Ice patches form via snow accumulation and compression over thousands of years. Once formed, ice patches have historically remained remarkably stable over time. Prior to the anthropogenic melting that has taken place in the last century, ice patches have remained fairly consistent in size and distribution for the last 5000 years (Hare et al. 2012). Co2 emissions arising due to the burning of fossil fuels are creating atmospheric greenhouse conditions, which in turn are generating positive feedback loops (Goosse et al. 2018). Canada's Changing Climate Report indicates that due to the continued emissions of C02 and other GHG's, the frequency and severity of extreme weather events, such as heatwaves, extreme precipitation, and the rapid degradation of the cryosphere, are likely to continue in the coming decades (Environment and Climate Change Canada 2021). This will affect Canada as a whole, but the impacts will be disproportionately severe in high latitude Arctic and Subarctic communities, which are experiencing more than twice the warming impacts as the rest of the globe (Goosse et al. 2018). As the seasonal snowpack decreases in the Subarctic, more ancient caribou dung is exposed on the surface; this creates a feedback loop. As more ancient caribou dung is revealed, it will effectively block the beneficial cooling effect of ice patches, as the albedo effect will be reduced by the dark colour, which in turn will cause the patches to melt at an accelerated rate (Andrews et al. 2012). Ion et al. also conclude, "high air temperatures were coincident with high levels of insect harassment" on caribou (Ion et al. 1989:210). Although it is beyond the scope of this paper, the projected rise in average temperatures over the next few decades will reduce the amount of persistent ice in the alpine, effectively decreasing suitable refugia habitat, and effect that will likely increase predation pressures.

The BC Heritage Conservation Act, which in theory protects archaeological sites (including cryogenic sites), appears to be at odds with the unrelenting expansion of Canadian fossil fuel industries (McClaren et al. 2020). As mentioned previously, the governments of both the Northwest Territories and the Yukon Territory have taken action to mitigate the loss of heritage resources, by partnering with First Nations and creating long term monitoring and recovery plans. The Province of British Columbia has done no such thing, even though there are significant heritage resources at risk. The impacts of anthropogenic climate change are extremely pronounced in the cryosphere, and the cultural, biological, and archaeological contexts of these remarkable cultural landscapes are disappearing along with the ice.

Results

The study area (figure 1.) was accessed by helicopter, boat, ATV, and on foot over an approximately two-week research period in August 2022. High levels of snow in 2022 made ice patch surveys difficult, and sometimes impracticable. Ideal conditions for ice patch archaeology arise when all of the seasonal snow has melted away, and only bare glacial ice remains. Organic artifacts typically will endure only if they are encased in persistent ice. While we still surveyed a large number of ice patches and remnant glaciers, the actual number of artifacts recovered from cryogenic sites was modest due to heavy snow cover. After securing a permit amendment from the BC Archaeology Branch, we began to focus on other types of alpine sites, such as quarry areas and hunting camps that are located in the subalpine. During the field seasons of 2022, seven new archaeological sites were recorded in the alpine and the subalpine. Of those sites, one organic artifact was located in persistent ice, and six were alpine sites without a cryogenic component.

A worked hide object (liUn-5) was also found that included regular holes that were presumably used to sew the hide to another substrate. Numerous faunal remains, including those of moose and caribou, were also found, although none appeared to be culturally modified. All organic artifacts and biofacts were found on north facing slopes, or slopes with significant northern exposure (NE-NW). We prioritized visiting ice patches and glaciers with visible caribou dung present on the surface. These tended to be under 30° in slope, although there were exceptions.

Sites that we encountered in the immediate vicinity of ice patches and alpine spaces include raw material procurement sites, such as quarries. During the field season of 2022, we recorded both an ochre quarry (IgUf-6), and a lithic tool quarry (IiUj-15, IiUi-2) that contained huge quantities of siliceous chert and chalcedony. The lithic quarry contained hundreds of flakes, cores, preforms, and multiple complete tools as well. The lithic quarry was surveyed enroute to a nearby ice patch in the Ínhéeni/ McKee Creek cirque. Bulk samples of lithic flakes, tools, and preforms were collected, however, only a small portion of the cirque was surveyed. The unsurveyed portion of the range likely contains additional high quality lithic deposits and tools. Due to time and budgetary constraints and the large geographic extent of each quarry, we weren't able to survey either quarry completely. Future research should focus on further surveys of these quarry sites. Additional ice patch surveys in the study area should be conducted in the summer following a low precipitation winter.

The survey team located a subalpine house depression (IkUh-02) that was likely used as a staging area for caribou harvest. An evaluative unit in the floor of the depression revealed extensive obsidian debitage and faunal remains. The faunal remains recovered from the evaluative unit unfortunately did not contain the minimum quantity of collagen required for accurate analysis, and so radiocarbon dates were not obtained for the submitted samples.

Samples from organic artifacts were sent to the André E. Lalonde Accelerator Mass Spectrometry Laboratory for C14 radiocarbon dating. Dates were obtained for liUn-5. The radiocarbon age range for the perishable hide object ranges from 3078–2929 calBP. X-ray fluorescence analysis was also performed on both the obsidian and the ochre samples. For more details, see the subsequent section titled “X-ray fluorescence obsidian sourcing.”

Surface lithics were recorded at five additional sites, four in the subalpine (IkUg-3, IhUm-07, IkUg-3 and IiUj-01) and one in the alpine (IjUj-27).

Yat'aayi Héen Geeyí (Warm Water Bay) - IiUj-01

Fig. 11. Frog Rock after freshet, East aspect. Photo by author

Temporary site# Frog_Rock_Cores_01
Borden Number (site record update): IiUj-01
Crew: Trevor Williams (TRT), Aaron Blake Evans (archaeologist) and Ben Louter (archaeologist)
Permit Number: 2021-0185

Site Description: The Frog Rock petroglyph is a well-known landmark near Atlin. It was the anchor stone for the caribou fence in Yat'aayi Héen Geeyí (Warm Water Bay). There are three distinct carvings on the stone: a caribou on the North aspect, a frog on the East aspect, and a smiling face on the West aspect. Frog rock is only visible in the early spring before freshet. By the end of June, it will be completely submerged. There are several oral histories about the origins of Frog Rock. This spring, while visiting the site, we encountered a centripetally knapped

core less than 45 meters from Frog Rock. The raw material is quite coarse, and it appears to be some type of granitic material. However, the resultant flakes would have been adequate for processing hides or a related task for which a sharp edge is not a requisite quality.

When the site was visited later in the summer, once water levels had risen substantially, I noticed that there was a line of large anchor stones that were aligned with Frog Rock. Together, they appear to form the foundation of the Tsóox, or fence (see **Oral Histories** section). These observations will be added to the existing site description, and the boundaries will be enlarged to accommodate the anchor stones that are part of the feature. Frog rock was originally recorded by archaeologist M. Howat in 1972. This is an update to the existing site record.

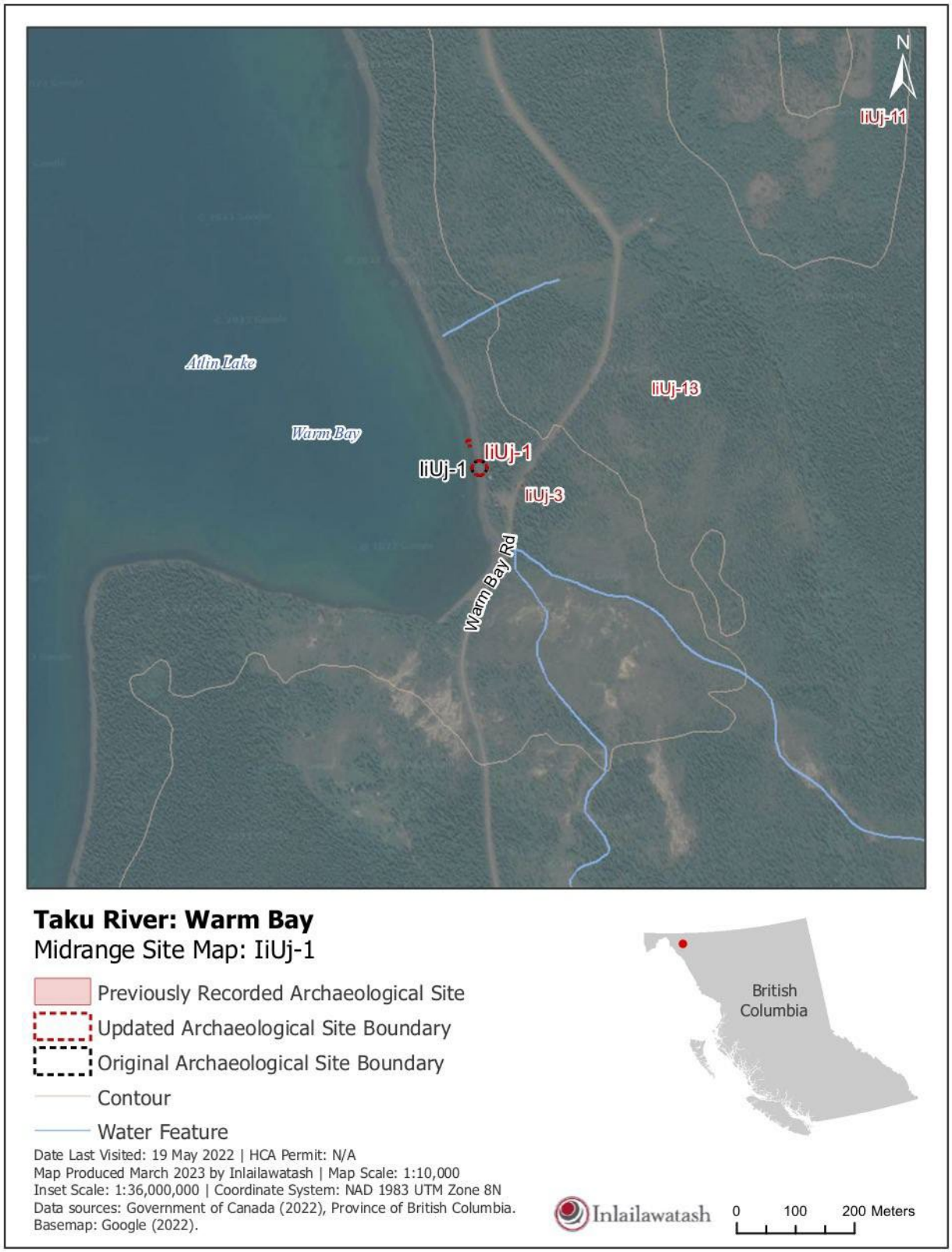

Fig. 12 Yat'aayi Héen Geeyí (Warm Water Bay) midrange map

Fig. 13 Yat'aayi Héen Geeyí (Warm Water Bay) detailed sitemap

Fig. 14. Petroglyph on the West aspect of Frog Rock. Photo by author

The site is located due north (approximately 100 meters) from the boat launch at the Warm Bay Recreation Site. Frog rock, as well as the lithic cores that we located, are seasonally submerged after freshet. The site includes one petroglyph on a boulder previously recorded, with the current additional find of a centripetally knapped lithic core located southeast of the petroglyph at 45 meters at 162 degrees.

While this site is accessible in the early spring (April and May), by August the entire foreshore is inundated due to seasonal snow melt. Due to the presence of large glaciers surrounding Atlin, lake levels have been steadily rising due to anthropogenic climate change. It is clear that the caribou fence that was originally attached to Frog Rock and the other anchor stones was not intended to be underwater.

Fig. 15. A centripetally flaked stone core in situ near the caribou fence. Photo by author

Fig. 16. Caribou carving on the North aspect of Frog Rock. Photo by author

Oral Histories: Jackie Williams, the late Clan Leader of the Yanyedi and Taku River Tlingit Elder, recounts in his collection of oral narratives "*Yáx Góoś*: The Cloud on The Face Of The Mountain" how caribou fences were employed during periods of much greater species abundance:

> There is a carved rock found along the shores of Warm Bay on Atlin lake. This rock has a Tlingit name, but I don't remember it now. The carvings or petroglyphs are on the east, west and north sides of the boulder. The east and west sides of the boulder are carved faces. I was told that one of these faces represents the frog or frog clan. The north side petroglyph is a carving of a caribou…. This rock marked the location of the lake end of a caribou fence, which in Tlingit is a *watsíx tsóoxu* (caribou fence). Tlingit people would drive herds of caribou from the Blue Canyon area down McKee Creek towards the fence…. The fence was constructed so that caribou would be funnelled towards an area where slots were strategically located in the fence. As the caribou squeeze through the

> slots, people were able to spear them. This was before people had guns. Remember there were a lot more caribou around in those days. This area was not forested, and the people would have to go a ways to get wood to build the fence. A large number of smokehouses (more than 10) were located near the fence where the forestry campground is located now. People would all get together to plan how they would get food (in Tlingit, *Woochnáx Wutuoodi.aat* means “we all get together”). Men would spear the caribou, women and children would cut the meat, older boys would hang the meat, and kids would get the firewood. This was how everyone learned how to do things. There used to be another caribou fence located near Como Lake. This is part of the history of Tlingit people on the Crow side, and the presence of this rock shows that Warm Bay was an important place for the Tlingit people (Williams 2023:43).

The use of technologies such as caribou fences strongly suggests large herd sizes that would have numbered in the thousands. Yáx Góoś’ history describes the role of not just Frog Rock, but the entire mountain cordillera to the East of Yat'aayi Héen Geeyí (Warm Water Bay).

Fig. 17. Line of anchor stones extending from Frog Rock

Fig. 18. Centripetally knapped lithic core

Dliwoowoo Shaa (Cathedral Mountain) - IhUm-07

Fig. 19. Dliwoowoo Shaa (Cathedral Mountain). Photo by author

Temporary site# TRTFN-081122-01 Cathedral Beach Lithic Scatter
Borden Number: IhUm-07
Crew: Terry Jack (TRT elder), Trevor Williams (TRT), Aaron Blake Evans (archaeologist), Ben Louter (archaeologist)
Permit Number: 2021-0185

Site description: When surveying the lakeshore for alpine staging areas, elder Terry Jack suggested that we stop at a sandy beach at the base of Dliwoowoo Shaa (mountain that shines) or Cathedral Mountain. The flat, sandy, triangular peninsula that we surveyed provides easy access to the caribou and mountain goat habitat higher up in the alpine. Located approximately 700m SE of Cathedral Creek. We completed six shovel tests on a North- South axis, and all were negative for cultural material. Despite this, there was a discovery of a chert (chalcedony) projectile point with associated flakes and block shatter on the beach. The base of the point itself appears to have broken. We also recorded two post 1846 CMT's and a modern firepit. In the future, additional shovel testing further inland, and a survey of the trail that leads from the shore up to the mountain along Cathedral Creek should be prioritized.

Fig. 20. Midrange site map of IhUm-07 Dliwoowoo Shaa (Mountain that Shines) cultural landscape

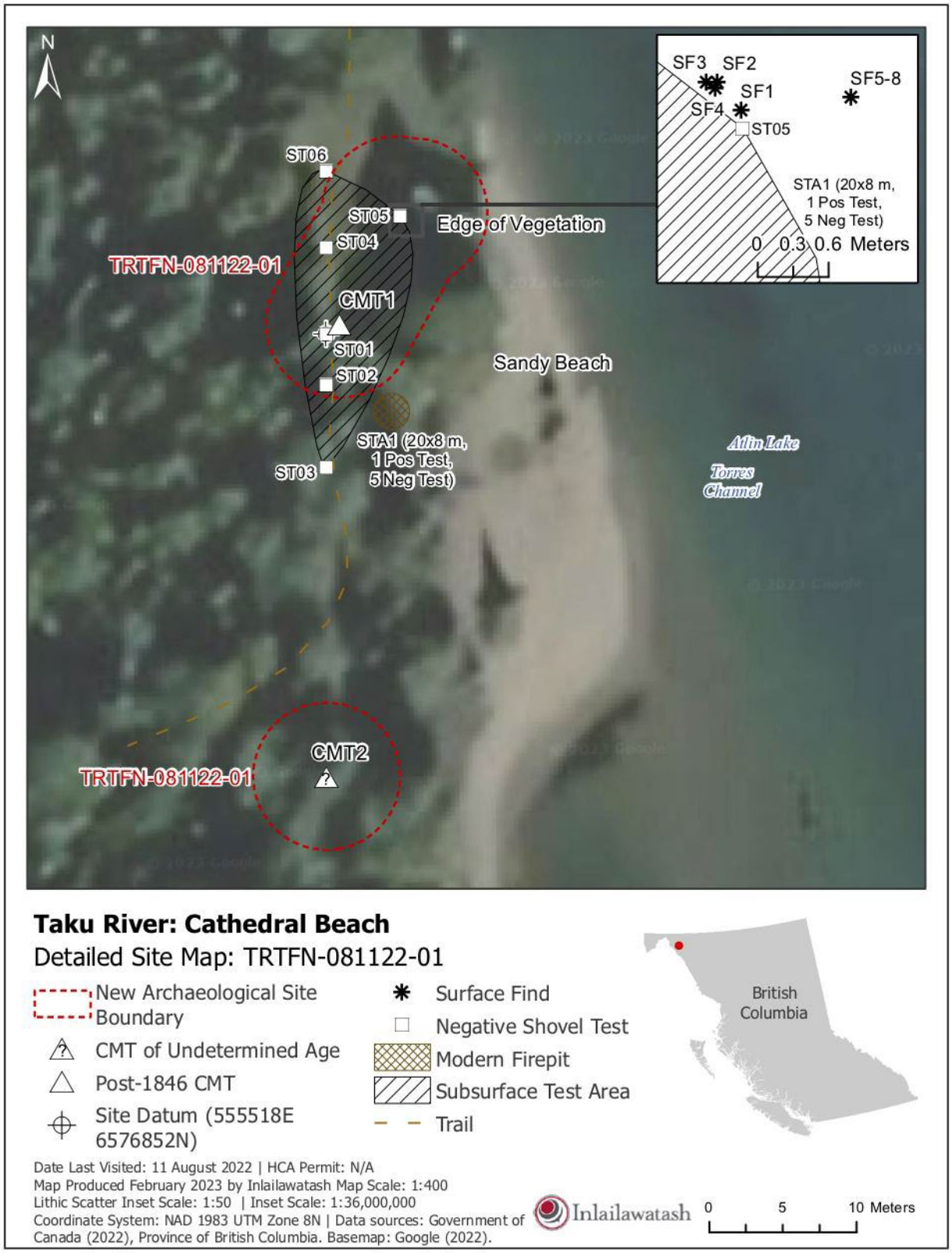

Fig. 21. Detailed site map of Dliwoowoo Shaa (Mountain that Shines) cultural landscape

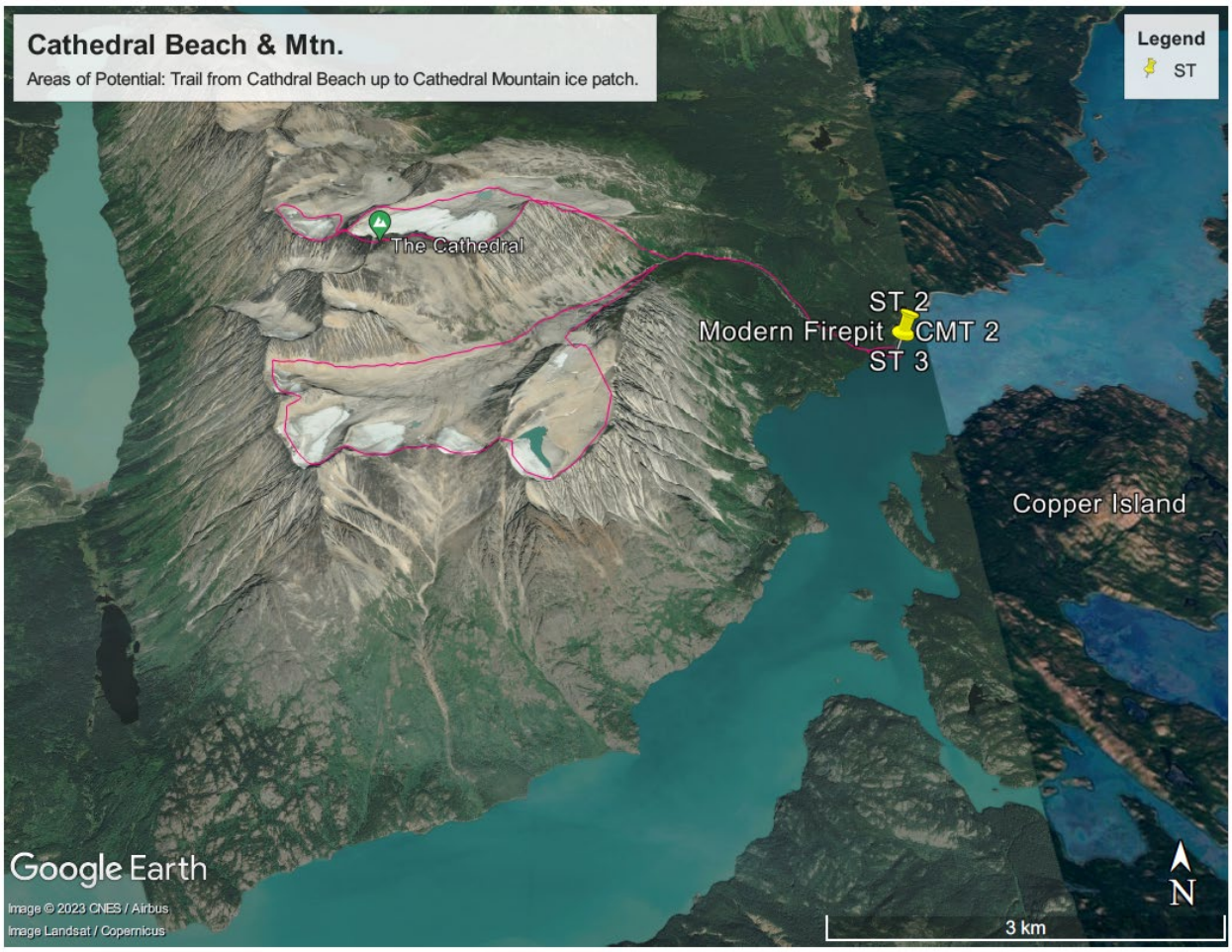

Fig. 22. Alpine access routes adjacent to the Dliwoowoo Shaa (Cathedral Mountain) camp

Fig. 23. Chalcedony projectile point and debitage found on the surface at Dliwoowoo Shaa (Cathedral Mountain). Photo by Maria Vigneron

Fig. 24. Close up of projectile point tip. Photo by author.

Oral histories: This site is also in immediate proximity to a landscape feature with a Lingít toponym.

Koosawu Áa (Narrow Lake) - IkUh-02

Fig. 25. TRT elder Terry Jack and archaeologist Aaron Blake Evans working on an evaluative unit in the floor of the house depression at the north end of Koosawu Áa near the confluence of Cup Creek and Pine Creek. Photo by author.

Temporary site# TRTFN_20220812_PineCup
Borden Number: IkUh-02
Crew: Terry Jack (TRT elder), Trevor Williams (TRT), Aaron Blake Evans (archaeologist), Ben Louter (archaeologist)
Permit Number: 2021-0185

Site description: This site is located near the outlet of Pine Cup Creek, which flows into Koosawu Áa (Surprise Lake), just north of Lingít Shéyi Shaa (Four Crown Mountain). The site is located on a sandy moraine that is approx. 120 meters East of Pine Cup Creek and 300 meters North of the Pine Cup confluence with Surprise Lake. The traditional Tlingit trail to Déináx Áayi (Gladys Lake) is well defined, and it passes by the house depression on a North-South axis. This

site is very close in proximity (15.25m) to site IkUh-2 identified by Sheila Greer in her 2006 report "Ruby Creek Mine Project Heritage and Archaeological Impact Assessment", but Greer made no mention of a house depression. It appears to have been just outside the project scope. The house depression is located on a sandy moraine feature that runs at a roughly North- South axis along Pine Cup Creek. The site is less than 1km from the base of Lingít Shéyi Shaa (“Indian Blood” mountain) known as Four Crown Mountain in English. The site is close to excellent caribou and mountain goat habitat. Koosawu Áa supports a robust greyling population.

Upon completion of three shovel tests spaced 5 meters apart on a North-South axis in the lower base of the house depression, we discovered obsidian flakes and calcine bone. We concluded that the depression was of cultural significance and most likely a large house depression. In order to avoid disturbing the stratigraphy caused by ST-01, we decided to establish an evaluative unit (labeled EU-01) measuring 1 x 1 meter in a flat area that had the highest potential for a subsurface hearth feature. With the use of trowels and sediment screening (with ¼ inch mesh), we carefully excavated and recorded data in 10cm layers. The stratum of EU-01 yielded a significant amount of obsidian debitage and calcine faunal remains, extending down to a depth of 55cm. Beyond 45-55cm dbs, the sediments became completely sterile, and we consequently ceased further subsurface excavation. Of the artifacts found, the most common were those related to tool and weapon maintenance, as well as cooking.

Calcine bone samples were sent to the André E. Lalonde AMS Laboratory at the University of Ottawa for radiocarbon analysis. Unfortunately, the faunal samples that were submitted did not contain the minimum quantity of collagen required for accurate analysis, and thus no radiocarbon dates were secured for this site.

Note: In September of 2022 a fire broke out in the local post office building in Atlin B.C. Sadly, the building burned to the ground. Luckily no one was injured during the fire. Unfortunately, I had just mailed a batch sample to the André E. Lalonde AMS Laboratory the day before the fire, and that entire sample subset was destroyed. The subset contained 50% of the faunal samples from each 10cm layer.

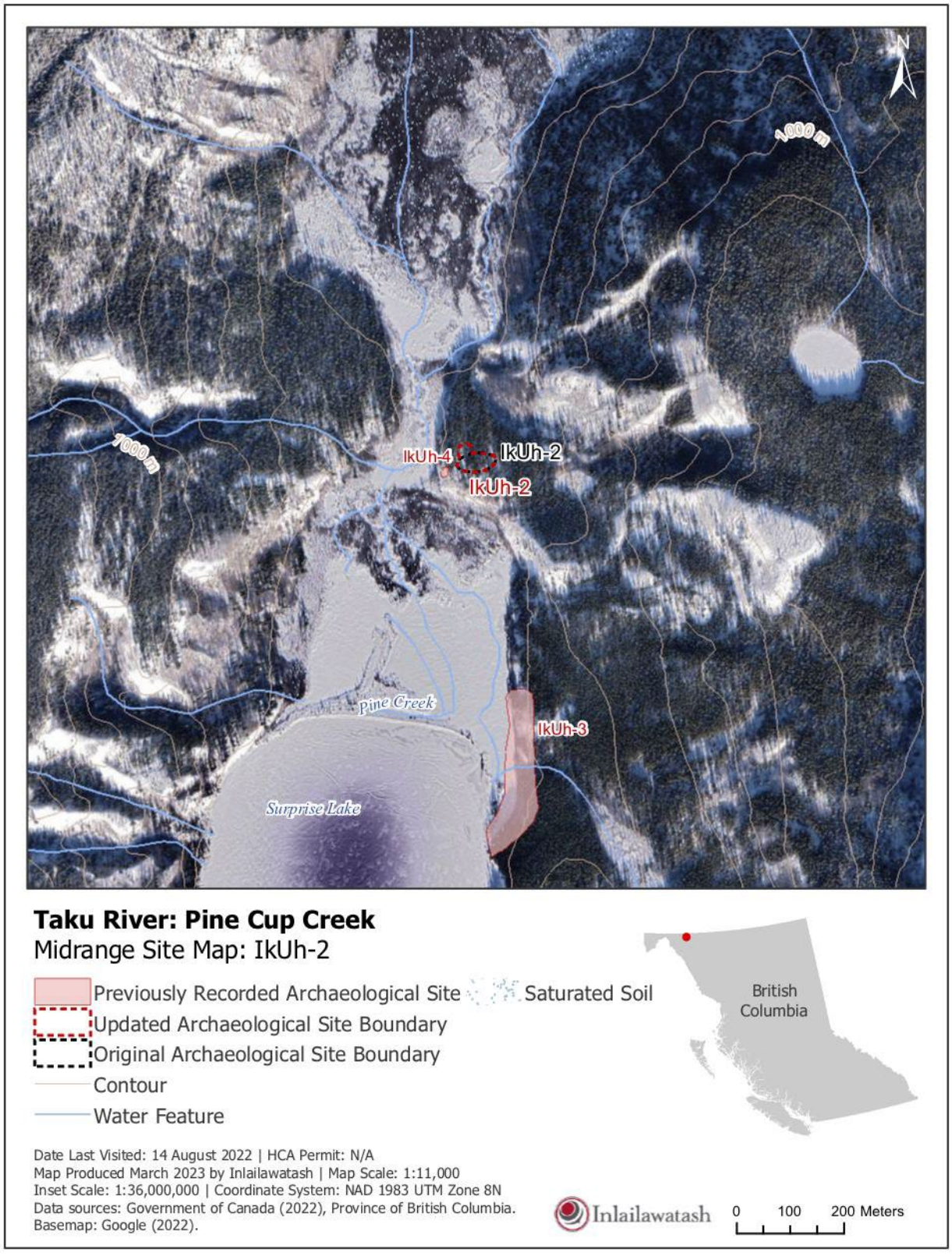

Fig. 26. Midrange map of the Koosawu Áa house depression and adjacent archaeological sites

Fig. 27. Obsidian debitage recovered from EU-01

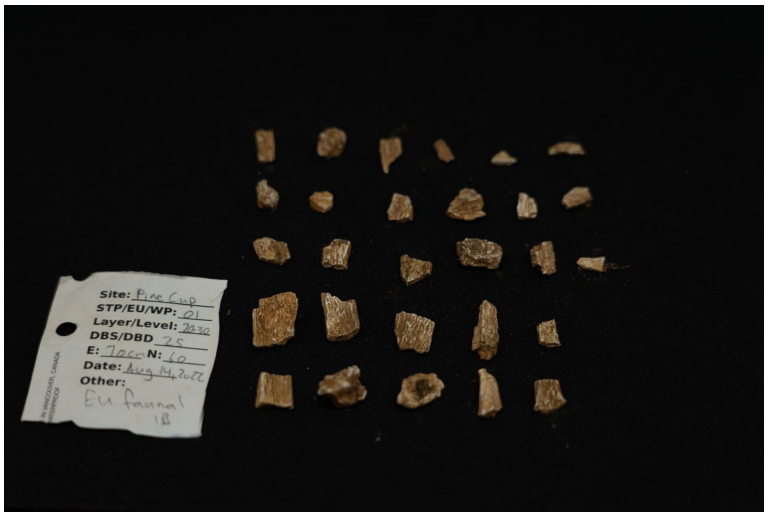

Fig. 28. Calcine faunal remains from EU-01

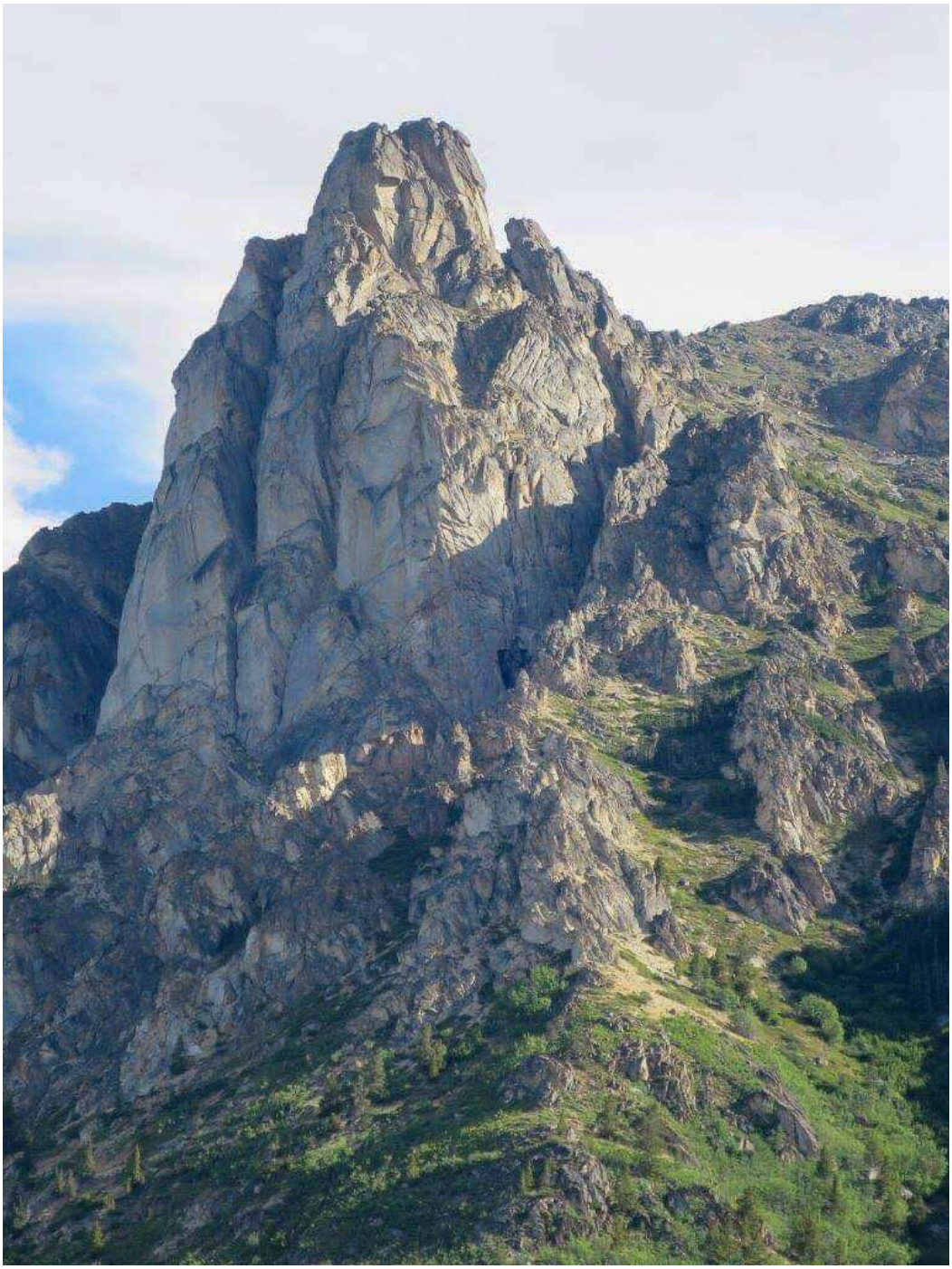

Fig. 29. Lingít Shéyi Shaa (Indian Blood) or Four Crown Mountain. Photo by author.

Oral histories: This site is located at the nexus of several important named places. The house depression on the shores of an important lake named, Koosawu Áa. Oral historians have pointed to the vibrancy of the T'ási (Grayling) fishery in Koosawu Áa (Surprise Lake)(Taku River

Tlingit First Nation 2013). It is also high value caribou and goat habitat. As previously mentioned, the traditional trail to Déináx Áayi (Gladys Lake) passes right in front of the house depression. The trail connects to the lands of the Deisleen Kwáan (Big Sinew Tribe), another Tlingit Nation whose traditional territories are located to the east, around Teslin Lake.

Lingít Shéyi Shaa is an important landmark in Tlingit cosmology. Elder Yáx góos (Jackie Williams) describes one of the oral histories about the mountain:

> A long time ago there was an eagle nest on Four Crown Mountain that had a Golden eagle nest on it. An Indian fellow wanted to get some eagle feathers from this nest. In the old days people used young eagle feathers for making snares. This is because the young feathers are soft and can be tied together. A young eagle was in the nest at this time. The fellow did something wrong and the eagle kicked the fellow out of the nest. There is a blood stain down the mountain to this day. This blood is visible from the north end of Surprise Lake, at a site called Lingít Shéyi Shaa, meaning "Indian Blood Mountain" on Four Crown Mountain (Williams 2023:39).

The involuntary exchange of the life of a clan member for territorial or harvesting rights has been described by Rosita Worl as one of the five pillars of At.oow (scared clan property) (Worl 1998). Clans and clan members often carried names that carried a geographic reference, and conversely landscape features often reference individuals (Thornton 2011).

Inland Tlingit housing

Catherine McClellan noted that the Tlingit villages on the Taku River closely resembled the longhouse style seen in many other Tlingit communities along the northwest coast (McClellan 2001). These sites comprised the winter villages for the T'aaku Kwáan. Circular houses were also used extensively by the Inland Tlingit, as well as other Indigenous groups that lived seasonally on the east side of the Coast Range (McClellan 2001). Styles varied, but in general they were conical in shape, the central support being either a tree or a pole and covered with either branches or hides (McClellan 2001). Although villages on the Taku featured more permanent, coastal Tlingit style dwellings, many of the hunting camps in the interior were used for a few months out of the year and were more expedient in nature. One of McClellan's informants told her that circular pit houses were used especially during wars. Further describing the architecture of these structures, McClellan stated: "Each tribe also built houses with a circular ground plan…. One man said that a square "box" was set in the apex for a smoke hole.

He specifically compared it with a windscreen in a coastal Tlingit house. At any rate, the fireplace was in the center. There was only one door. Such houses were evidently fairly large, and they too were occupied by several families." (McClellan 2001:242). Even up until the mid-20th century, many Inland Tlingit families would spend weeks or even months of the year away from the recognizable communities, hunting and trapping.

X-Ray fluorescence analysis

The lithic debitage that we encountered during excavation of the house depression was entirely comprised of obsidian. Obsidian, a type of igneous rock, is present at sites of human occupation that extend back to the late Pleistocene in North America (Erlandson and Braje 2011). Obsidian is volcanic glass that forms when felsic lava cools rapidly, with no time to allow for crystal growth. Its homogenous texture and conchoidal fracture pattern make it relatively easy to knap into a wide variety of tools and objects. Obsidian has historically been widely used and traded by Indigenous peoples in the northwestern Subarctic (Erlandson et al. 1992; Kristensen et al. 2021; Reimer 2015). The northwestern Coast Range contains several high-quality volcanic massifs that produce obsidian. Suemez Island and Kupreanof Island, both situated on the Alaskan panhandle, contain high-quality obsidian nodules and outcrops.

In the winter of 2023, I submitted 8 samples of culturally modified obsidian from the house depression subfloor to Dr. Rhy McMillan (GeoArchaeo Consulting) for X-ray fluorescence analysis. Trace element concentrations (rubidium, strontium, niobium, yttrium and zirconium) in the samples were analyzed with X-ray fluorescence spectroscopy. Elemental data was then compared to known sources within the framework of the provenance hypothesis to establish relationships among the samples (McMillan 2023; Wilson 2001).

The Provenance Hypothesis

The provenance hypothesis (as discussed by Wilson and Pollard, 2001) asserts that relationships between artifacts and potential sources can only be used to rule out associations with other sources, rather than proving an association with a specific source.

This method is consistent with a null hypothesis, which maintains that the artifact did not come from any known source, but each alternate hypothesis holds that the artifact came from a specific geological location (McMillan 2023). We compared the trace element properties of the studied artefacts to established geological sources in order to exclude as many potential sources as possible, until only one option remained that could not be ruled out.

[3]Portable x-ray fluorescence (pXRF) methods

Trace element concentrations were collected non-destructively with an Olympus Vanta C-Series portable X-ray fluorescence (pXRF) analyser following the procedure in McMillan et al. (2019) and McMillan et al. (2022). Analyses were carried out using the 'GeoChem-extra' method with factory settings (i.e., no user factors were applied to the resulting concentrations) and Fundamental Parameters calibration. 'GeoChem-extra' mode varies the current and voltage of the 4-W X-ray tube (with a Rh anode) in combination with two built-in beam filters to improve the fluorescence of both lighter and heavier elements within a single analytical run. Spectra were collected for 60 seconds per analysis (30 second on each beam). The investigated samples were analysed at least in triplicate.

Instrument drift was monitored for potential correction by bracketing samples with the NIST 2711a Montana Road Dust standard reference material (Mackey et al. 2010) and the NIST 278 Obsidian Rock standard reference material. No drift was observed during any analytical sessions, and the trace element compositions of NIST 2711a and 278 were consistently within <5% (relative) of expected concentrations. In addition, the accuracy of concentration results produced by the same instrument was evaluated by analysing the Peabody-Yale Reference Obsidian (PYRO) calibration (n = 20) and check (n = 15) standards (Frahm 2019; McMillan et al. 2022). The measured values for the PYRO calibration standards and uncalibrated check standards were on average within <10% (relative) of expected values, and thus no post-hoc calibration or adjustment of the parameters from the default settings was deemed necessary as observed in Frahm (2017).

[3] The "pXRF methods" section, as well as the "Results" section were written by Dr. Rhy McMillan.

We used the SourceXplorer application (Version 1, (McMillan et al. 2022) www.sourcexplorer.org) to apply linear discriminant analyses (LDA) and principal components analyses (PCA) to scaled concentrations of Rb, Sr, Zr, Nb, and Y in R v 4.1.2 (R Core Team 2022). SourceXplorer is a graphical user interface built in the R programming environment that identifies and systematically attempts to reject alternate hypotheses of provenance for each analysed unknown (belonging/artifact) using three different levels of scrutiny (basic, standard, and robust) evaluated via a series of post-hoc tests. These post-hoc tests include assessing if the unknown actually falls within the convex hull and/or the confidence ellipse of the predicted source in canonical (LDA and PCA) space. A 'convex hull' is a geometric shape that can be visualized as a string or rubber band stretched around the most extreme points of a population in bivariate space. Effectively, these tests fully automate and quantify the traditional 'matching' of unknowns to sources using bivariate diagrams, in this case using canonical variables (PC1, PC2, LD1, LD2). Based on the relationship of an unknown to its predicted source population's convex hull and confidence ellipse in LDA and PCA space, three sourcing outcomes are possible:

1. 'Basic' - specimens must fall into either the convex hull or the confidence interval for their predicted source in either LDA or PCA space (so, at least one 'match' overall);
2. 'Standard' - specimens must fall into either the convex hull or the confidence interval for their predicted source in both LDA and PCA space (so, at least one 'match' in both LDA and PCA space); and
3. 'Robust' - unknowns must fall into both the convex hull and the confidence interval for their predicted source in both LDA and PCA space (so, matches for all distribution types in both diagrams).

Specimens that 'fail' the tests above revert to 'unknown' for the relevant sourcing summary. See McMillan et al. (2022) for full documentation of the attributes of SourceXplorer. For cross-validation of the efficacy of SourceXplorer during this study,

we treated the NIST 278 Obsidian Rock (Newberry Crater, Oregon) standard reference material as an unknown. It was assigned to and passed the 'standard' level of post-hoc tests for the correct source location (Newberry Volcano).

pXRF Results[4]

The trace element compositions of the eight belongings analysed for this study are presented in Table 1 and Figure 1.
All investigated samples were predicted by LDA in SourceXplorer to Mount Edziza (at the volcano spatial resolution) with >88% posterior probability in a model containing 2,147 obsidian observations from 20 common source localities in Western North America.

All samples passed the 'standard' level of scrutiny for the Mount Edziza hypothesis of provenance in SourceXplorer. Further, samples Pine-Cup-01-20-30a, Pine-Cup-01-20-30b, Pine-Cup-01-20-30d, Pine-Cup-01-21a, and Pine-Cup-01-30-5a also passed the 'robust' level of scrutiny. These outcomes suggest an extremely strong similarity between the trace element compositions of belongings in the investigated assemblage and natural glasses at the Mount Edziza source locality.

The investigated samples also form at least two discrete populations, suggesting that they are composed of different varieties and thus may originate from different 'flows' from the same volcanic centre. However, depending on the distribution of Quaternary sediments in the region, more than one glass variety may have been available from the same sedimentary deposits and thus at the same procurement location.

[4] The "pXRF methods" section, as well as the "Results" section were written by Dr. Rhy McMillan. For the full citation, see (McMillan 2023)

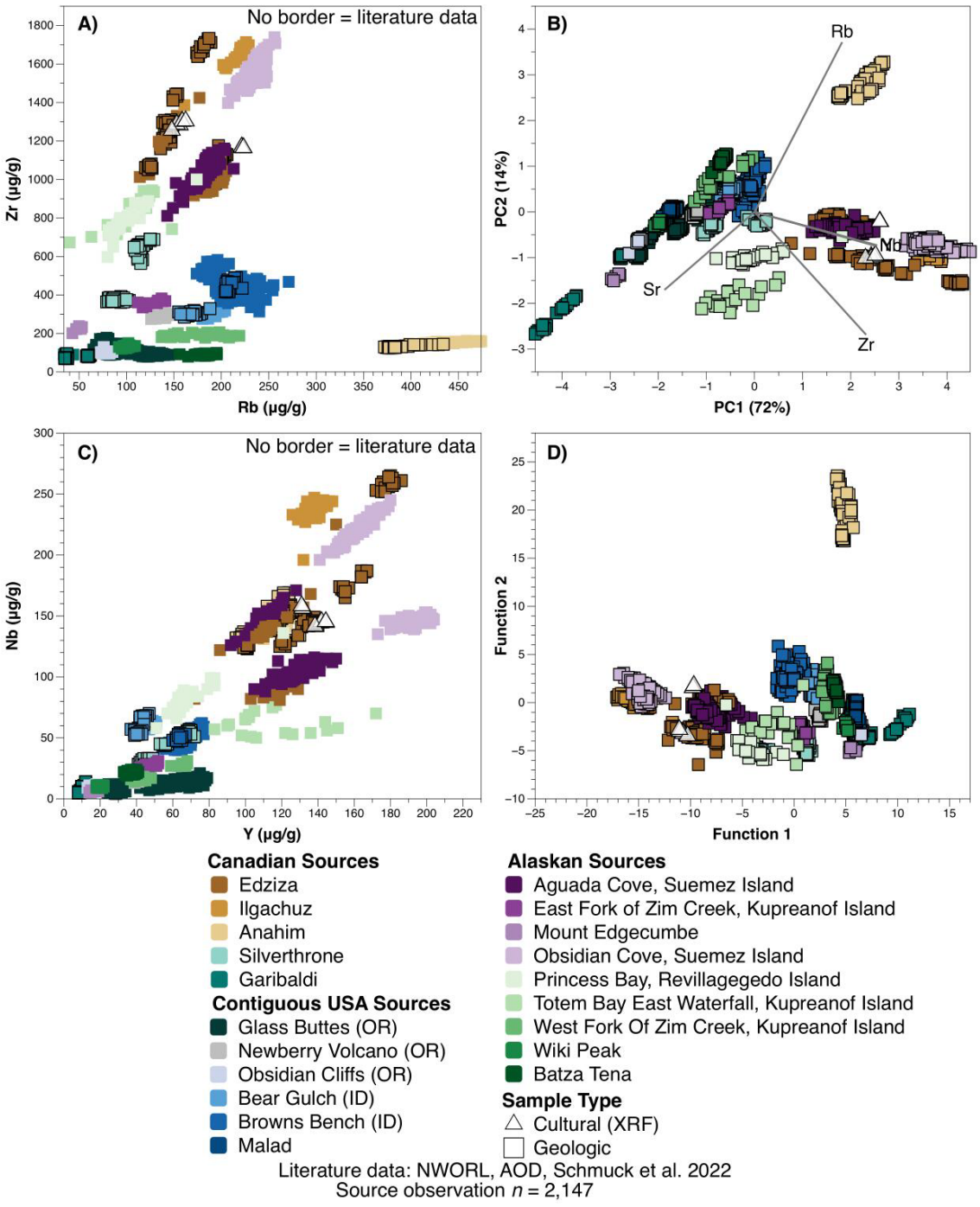

Fig. 30: Trace element concentrations (Panels A and C) and canonical scores for principal components analyses (PCA; Panel B) and linear discriminant analysis (LDA; Panel D) for the investigated archaeological glass samples compared to 2,147 obsidian source material observations. LDA model accuracy was assessed using a test/training set of 20/80% source observations and yielded ~86% of cases correctly re-classified (McMillan 2023)

Sample	LDA Prediction (Posterior Probability, %)	'Standard' SourceXplorer Sourcing Summary	Rb mean (µg/g)	Rb 1SD (µg/g)	Sr mean (µg/g)	Sr 1SD (µg/g)	Y mean (µg/g)	Y 1SD (µg/g)	Zr mean (µg/g)	Zr 1SD (µg/g)	Nb mean (µg/g)	Nb 1SD (µg/g)	*n*
Lithic-08	Edziza (88.9 %)	Edziza	222	1	1	1	132	3	1166	8	156	2	3
Pine-Cup-01-20-30a	Edziza (97.54 %)	Edziza*	156	1	<LOD	-	141	3	1283	5	144	2	3
Pine-Cup-01-20-30b	Edziza (97.73 %)	Edziza*	153	3	<LOD	-	142	4	1287	8	145	1	3
Pine-Cup-01-20-30c	Edziza (90.2 %)	Edziza	221	2	1	1	131	1	1168	4	156	1	3
Pine-Cup-01-20-30d	Edziza (97.84 %)	Edziza*	159	2	<LOD	-	144	2	1302	6	145	3	3
Pine-Cup-01-21a	Edziza (96.62 %)	Edziza*	148	2	<LOD	-	138	1	1256	7	142	1	3
Pine-Cup-01-30-40a	Edziza (89.88 %)	Edziza	223	1	3	1	131	2	1165	6	158	2	3
Pine-Cup-01-30-5a	Edziza (97.9 %)	Edziza*	162	1	<LOD	-	144	2	1304	2	145	2	3

Fig. 31. Sourcing summaries and elemental concentrations with related uncertainties reported to 1SD for the analysed belongings investigated in this study. Note that '*' indicates samples that also pass the 'robust' level of scrutiny in SourceXplorer. Analyses below the limit of detection ('<LOD') were converted to 1 µg/g for statistical analyses, which is half of the estimated detection limit for the trace elements of interest (McMillan 2023).

After systematic investigation of relationships among the trace element compositions of eight archaeological glass samples and 20 common obsidian source localities in Western North America, all sources except Mount Edziza can be confidently excluded as possible candidates for all analyzed archaeological samples.

Discussion

Mount Edziza, A stratavolcano in the Stikine region of Northern British Columbia, has served a major source of high-quality obsidian for many subarctic Indigenous peoples since the early Holocene (McClaren and Gray 2020; Kristensen et al. 2019; Fladmark 1985; Reimer 2015). Along the northwest coast of British Columbia, obsidian artifacts ranging between 6000-4000 B.P. are ubiquitous in lithic assemblages (Baugh and Ericson 1994; Moss 2004). The Edziza complex is part of the Northern Cordilleran Volcanic Province, and over the previous 7.5 million years, this region has seen extensive volcanic activity (LaMoreaux 2008; Souther 1992). While much of the complex was encompassed by glaciers during the Last Glacial Maximum (26,000-

19,000 BP) there is geological evidence that suggests that little or no glaciation occurred above 1600-1500 m on Goat Mountain (Fladmark 1985; McClaren and Gray 2020).

The Edziza complex contains ten geochemically distinct obsidian flows, at least six of which were utilized as quarries (Reimer 2015). The Goat Mountain outcrop appears to have been the most widely used, as both the quality of raw material is excellent, and the site is extensive (McClaren and Gray 2020; Reimer 2015). Fladmark writes that the Goat Mountain quarry likely served local Indigenous populations as a dual purpose, "combined hunting-lithic exploitation excursions" as many of the lithic scatters are "in situations where a dominating overlook seems the main objective" (1985:67). Previous XRF sourcing has confirmed Edziza obsidian was transported widely throughout a 2.2 million km2 radius by Indigenous peoples, with southern British Columbia and central Alaska at the extremities (Kristensen et al. 2019; Springer et al. 2018). It is clear that Edziza obsidian was traded and exchanged widely throughout the Holocene. At the time of European arrival on the west coast, the Shtax'héen Kwáan (Stikine Tlingit) controlled the Stikine River, which connects Mount Edziza to the west coast (Teit 1909; University of Alaska Fairbanks 2023). Sylvia Allbright indicated in her report "Tahltan Ethnoarchaeology" that Tlingit Kwáans occupied the Stikine River as far east as Telegraph Creek (1984). This geographic extent of the Tlingit occupation of the interior reaches of the Stikine was also echoed by Thomas Thornton in "Haa Leelk'w Has Aani Saax'u / Our Grandparents' Names on the Land" (2012).

Yáx góos (Jackie Williams) described the earliest T'aaku Kwáan settlement: "A long time ago, a glacier extended across the mouth of the Taku River, and people did not know the Taku River was there. That is why the Taku River Tlingit originally came up from the coast through the Stikine River, establishing a village at Xalak'ách' Héeni (Porcupine River). The river was called the Porcupine because spruce trees sticking out of the glacier looked like porcupine quills. I believe this is the river they now call the Chutine. From here the Tlingit expanded their trapping and began settling the Upper Taku drainage, moving downstream along the Sheslay River" (Williams 2006: 7).

The confluence of the Chutine and the Stikine is approximately 60 kilometers from the summit of Mt. Edziza. Swanton also noted that the Stikine Tlingit, who controlled the Stikine valley in

addition to coastal islands, originally migrated south from the Taku river (Swanton 1909). It appears that there was a great deal of cross pollination between the T'aaku Kwáan and the Shtax'héen Kwáan, including shared village locations (Thornton 2012). There are important clan connections between the T'aaku Kwáan and the Shtax'héen Kwáan. The S'iknax̲.ádi Clan of the Shtax'héen Kwáan took their name from S'iknax̲ (Limestone Inlet) which is located near the mouth of the T'aaku. Thornton noted that Taku Harbour (S'iknax̲s'aank'í) "...was the site of another important T'aaku village, and was named for its proximity to Limestone Inlet (S'iknax̲) from which the S'iknax̲.ádi clan derives its name (although the original site was up Stikine River…)" (Thornton 2012:69).

In addition to the Tlingit village at Xalak'ách' Héeni, Tlingit fish camps lined the Stikine at every confluence from Shake's creek to Telegraph Creek (Albright 1984; Emmons 1911; Thornton 2012). The trail to Mt. Edziza begins at present day Telegraph Creek (Reimer 2015). Trade relationships between Athapascans and coastal Tlingit groups would have facilitated east-west movement of obsidian. Catherine McClellan also noted that "…Tlingit traders brought obsidian inland to trade" (McClellan 2001:290). Numerous grease trails and travel corridors on the Taku, Stikine, Alsek and Copper rivers would have further facilitated obsidian trade in both a north-south as well as an east-west orientation (Daly 2005; Reimer 2015; Kristensen et al. 2019).

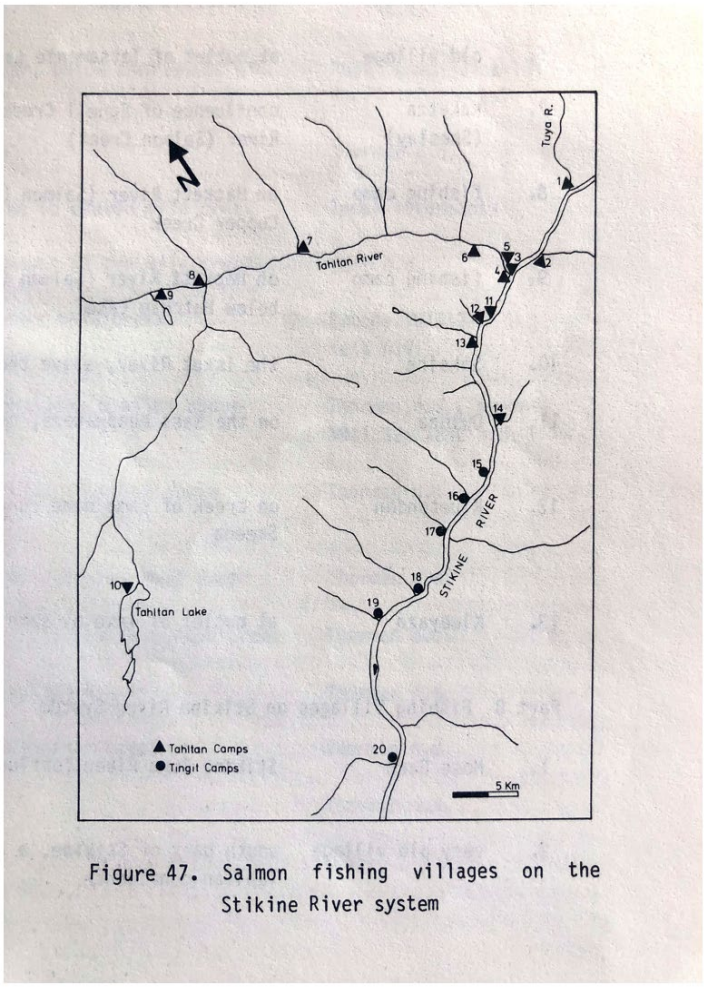

Figure 47. Salmon fishing villages on the Stikine River system

Fig. 32. Map of Tlingit villages (circles) and Tahltan villages (triangles) on the Stikine River (Albright 1984:85).

Mt. Switzer - IiUn-5

Fig. 33. Terry Jack and Ben Louter preparing to survey an ice patch near Mt. Switzer. Photo by Blake Evans.

Temporary site# TRTFN_20220813_Nelson_Hide
Borden Number: IiUn-5
Crew: Terry Jack (TRT elder), Trevor Williams (TRT), Aaron Blake Evans (archaeologist), Ben Louter (archaeologist)
Permit Number: 2021-0185

Description: On a glaciated ridge located due West of Edgar Lake and north of Áa Tlein (Atlin Lake). It has excellent caribou and mountain goat habitat, and it is in close proximity to the Wann River Trail that connects Atlin Lake to Tagish Lake. We found a worked hide object melting out of a glacier on a north facing slope. No vegetation present. The landscape consists of glacial ice, talus, boulders, cobbles and pebbles. Site boundaries are 5x5 meters. The ice patch has been recorded as an Area of Potential.

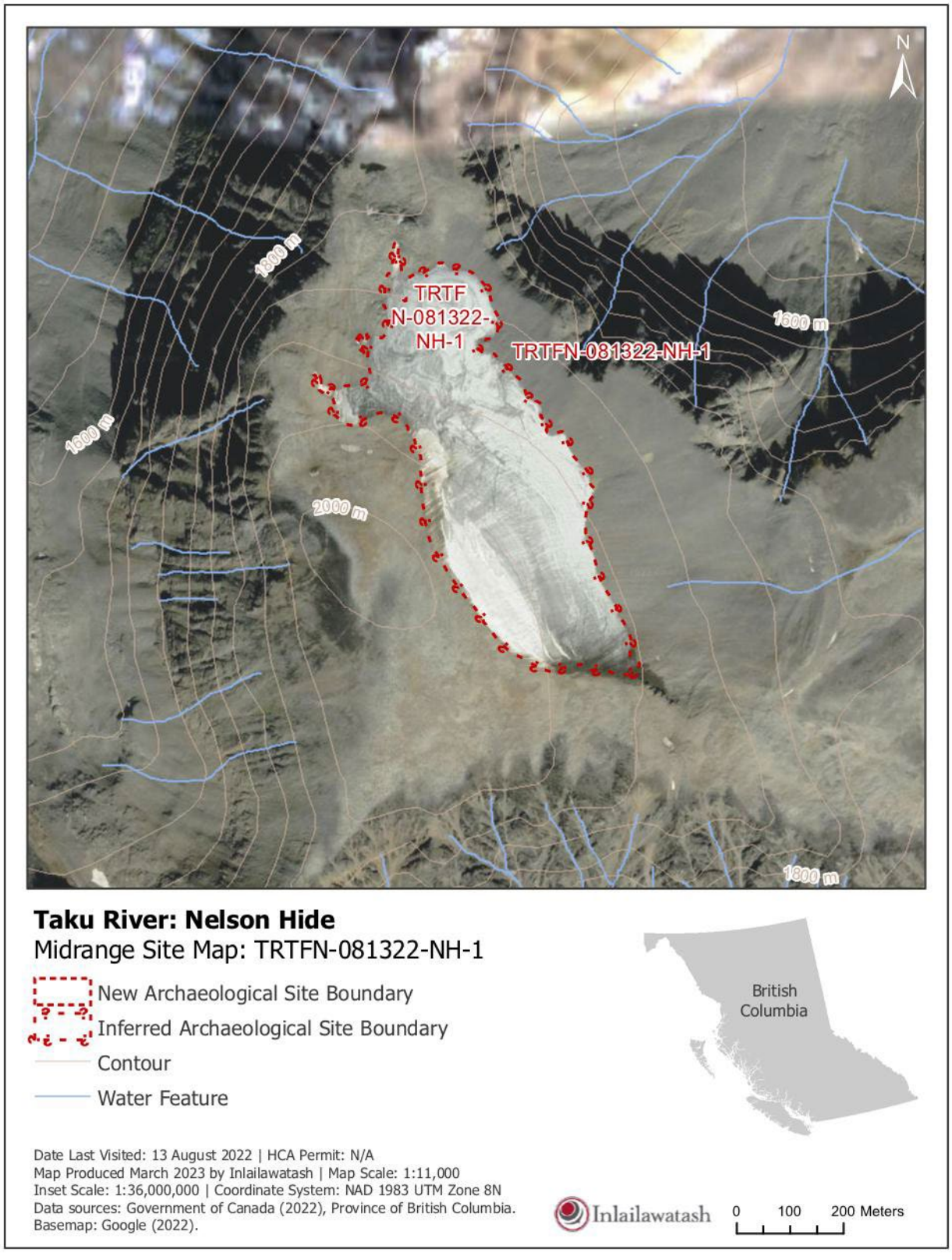

Fig. 34. Midrange site map of archaeological site boundaries on Mount Switzer

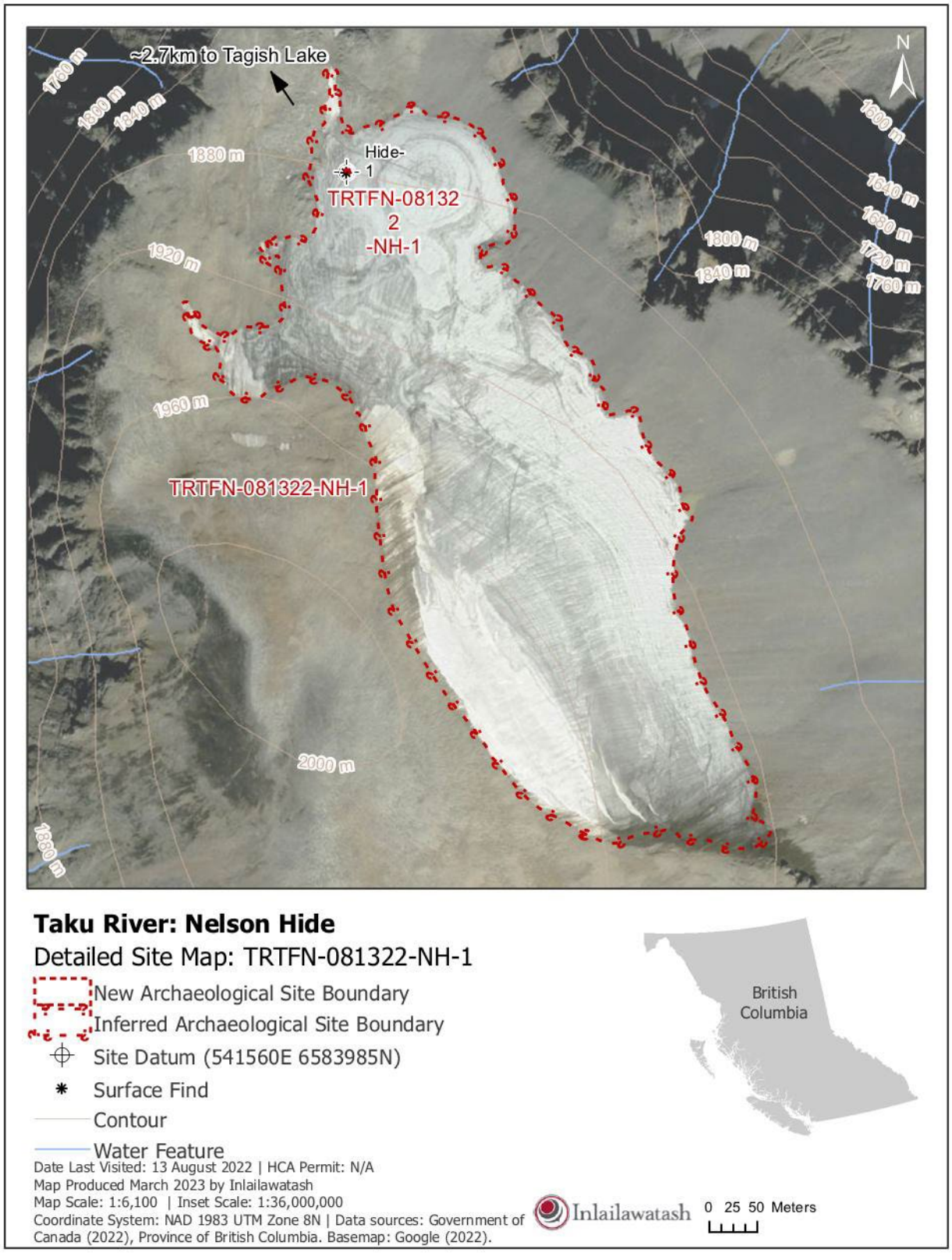

Fig. 35. Detailed site map of archaeological site boundaries on Mount Switzer

Fig. 36. Location where we came across a worked hide object melting out of the ice. Tagish Lake is in the background.

Fig. 37. Hide object in situ

Fig. 38. Detailed view of tanned hide object. The object has regular holes cut into it, indicating it was likely sewn to another material.

The hide object was radiocarbon dated to 2881 YBP +/- 25 years. The André E. Lalonde AMS Laboratory at the University of Ottawa performed the radiocarbon analysis. Radiocarbon analysis procedures are provided in Appendix V.

Ínhéeni (McKee Creek) - IiUj-15, IiUi-2

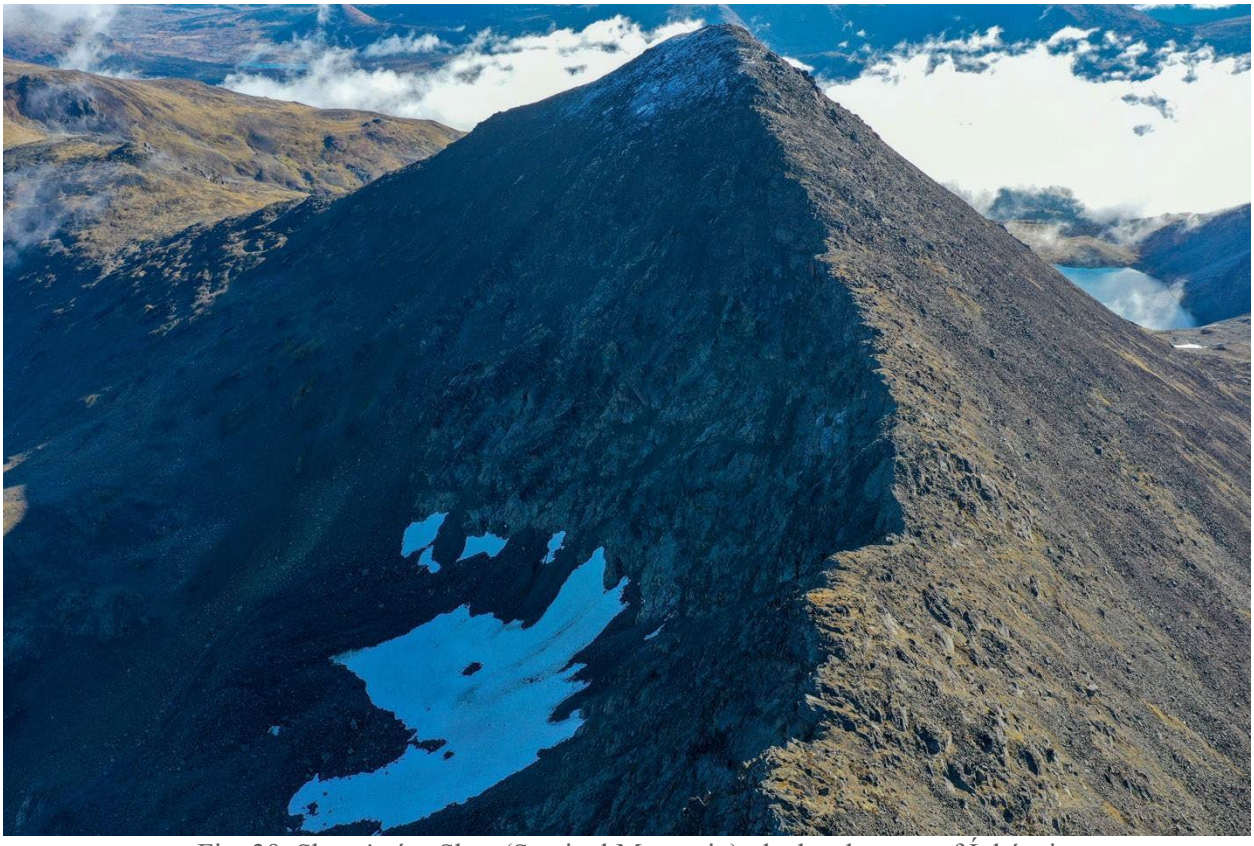

Fig. 39. Shaax'wáas Shaa (Sentinel Mountain), the headwaters of Ínhéeni

Temporary site# TRTFN_20220907_Inheeni2, TRTFN_20220824_Inheeni1
Borden Number: IiUi-2, IiUj-15
Crew: Barb Dawson (TRTFN) Ben Louter (archaeologist)
Permit Number: 2021-0185

Description: The sites recorded here represent a small sampling of a geographic area that was selected as a stone tool quarry by the Taku River Tlingit people. Shaax'wáas Shaa (Mt. Sentinel) is located approximately 20 km south of the Atlin townsite and 6 km east of Atlin Lake. In the Tlingit language, the drainage that forms at the base of Shaax'wáas Shaa (Mt. Sentinel) is called Ínhéeni Sháak which translates to "Flint Creek". Its English name is Mckee Creek. The Eldorado trail leads into the alpine and is a popular hiking route. There are many bands of high-quality siliceous chert in this cirque. Flakes, cores, preforms, and complete tools are common on the SW ridge of Sentinel; flakes and cores are in greater abundance than complete tools. The complete tools that were recorded were expedient. This area was undoubtedly used for the procurement of

raw materials and the manufacture of lithic cores. Without heat treatment, chert is extremely difficult to knap with any precision, and this quarry site is located high above the treeline. The site is also situated in close proximity to the caribou fence at Yat'aayi Héen Geeyí (Warm Bay) and it is productive caribou habitat. It contains some of the few remaining persistent ice patches on the east side of Atlin Lake. During the Klondike gold rush, much of this area was staked for mineral exploration, and there is extensive evidence of mining activity (leading up to the present day) in the entire lower watershed.

The first site that was recorded was a unifacial chert scraper. It was located on August 24, 2022, on the trail that leads up into the alpine. The temporary site number was TRTFN_20220824_Inheeni1, and its Borden number was registered as **IiUj-15**.

We returned to the quarry site initially noted on August 24, 2022, again on September 7, 2022 and recorded a portion of the ridge, which was used for lithic reduction and quarrying activities. The temporary site number for the second survey of this area is TRTFN_20220907_Inheeni2, Borden number **IiUi-2**.

Site Boundary Comments: This mountain range contains numerous outcrops of highly siliceous chert and chalcedony, which were used in the production of stone tools. There is evidence of quarrying and lithic manufacture in every stage. There are artifacts, tested boulders, nodules, as well as reduction stations and debitage. The Ínhéeni (Mckee Creek) drainage is also excellent caribou and goat habitat. It is adjacent to Yat'aayi Héen Geeyí (Warm Bay) where a caribou fence was located. The caribou fence is a known butchering site. There are hundreds of flakes, cores, and other types of debitage such as block shatter in this range, and the area that was recorded was only a small sample. While I have identified artifacts along a section of the ridge approx. 500m long, the valley below Mt. Sentinel also contains an abundance of high-quality lithic material. It is solely in the interest of time and financial constraints that I have only systematically surveyed a small segment of this mountain. Hence the arbitrary site boundary. Since there is such a large quantity of worked lithic material, individual flakes have not been mapped. UTM points for complete artifacts or preforms have been collected. For several lithic scatters, I have photographed them and recorded their location with a waypoint, but I did not

collect them. My reason for this was to provide a sense of the density of lithic scatters along the 500m section of the ridge. Collecting every artifact would be out of the question. To provide some delineation, I have created a gps track around a landform with a high concentration of quarrying activity. I have also taken UTM points in the middle of high-density lithic scatters and outcrops. A sample of representative flakes and raw material have been collected from the high-density quarry sites.

Fig. 40. IiUj-15 unifacial scraper in situ. Photo by author

Fig. 41. IiUj-15 unifacial scraper – dorsal. Photo by author

Fig. 42. IiUj-15 unifacial scraper – ventral. Photo by author

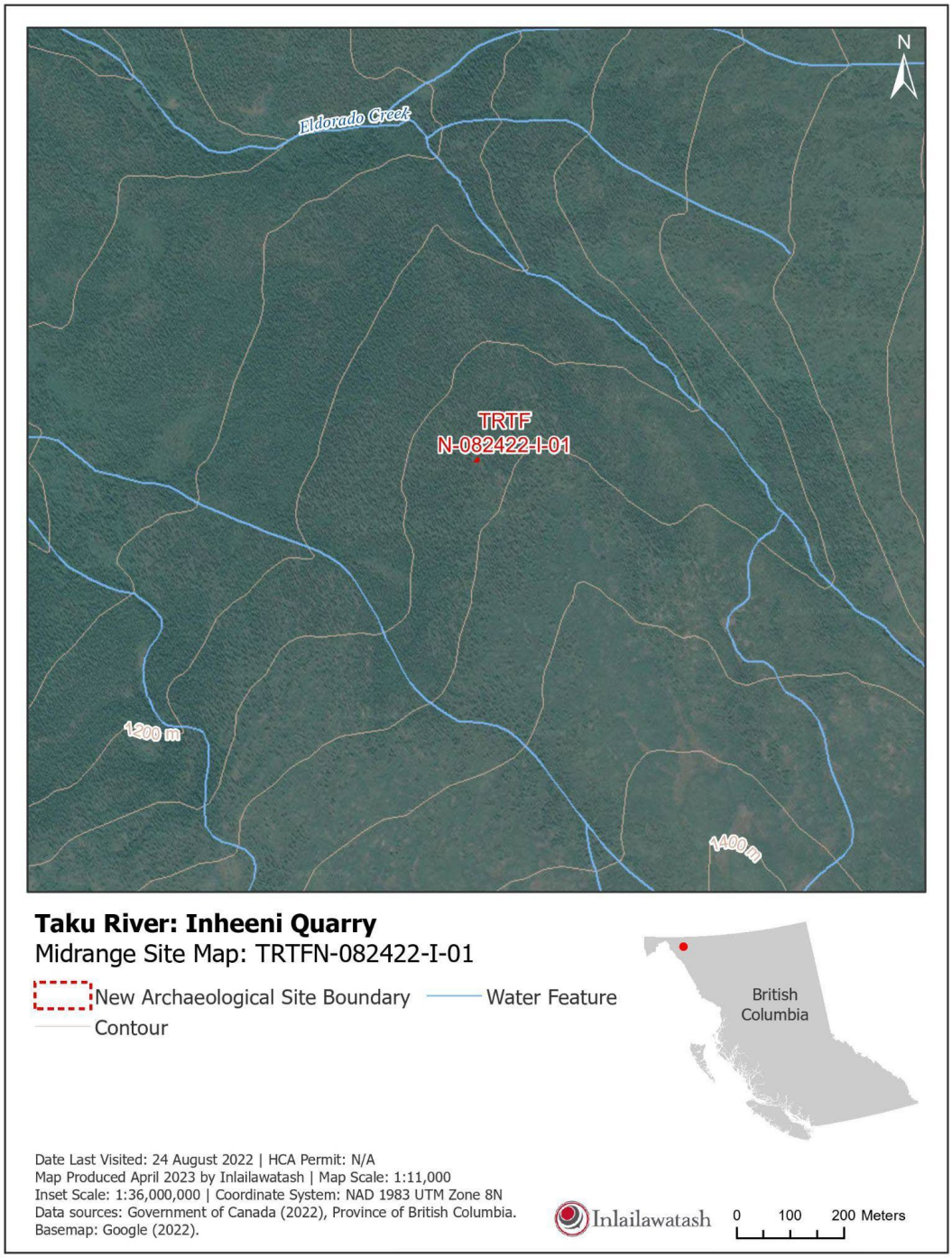

Fig. 43. midrange sitemap of IiUj-15

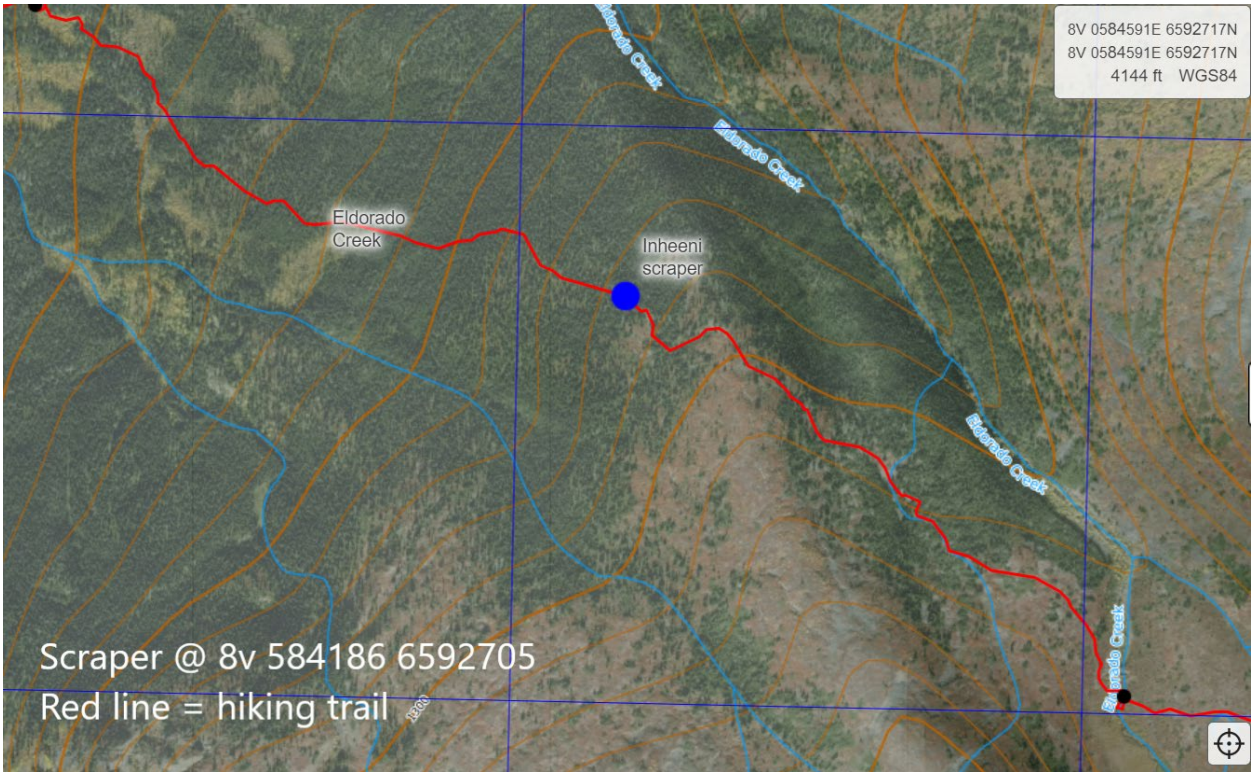

Fig. 44 detailed sitemap of IiUj-15 with El Dorado hiking trail

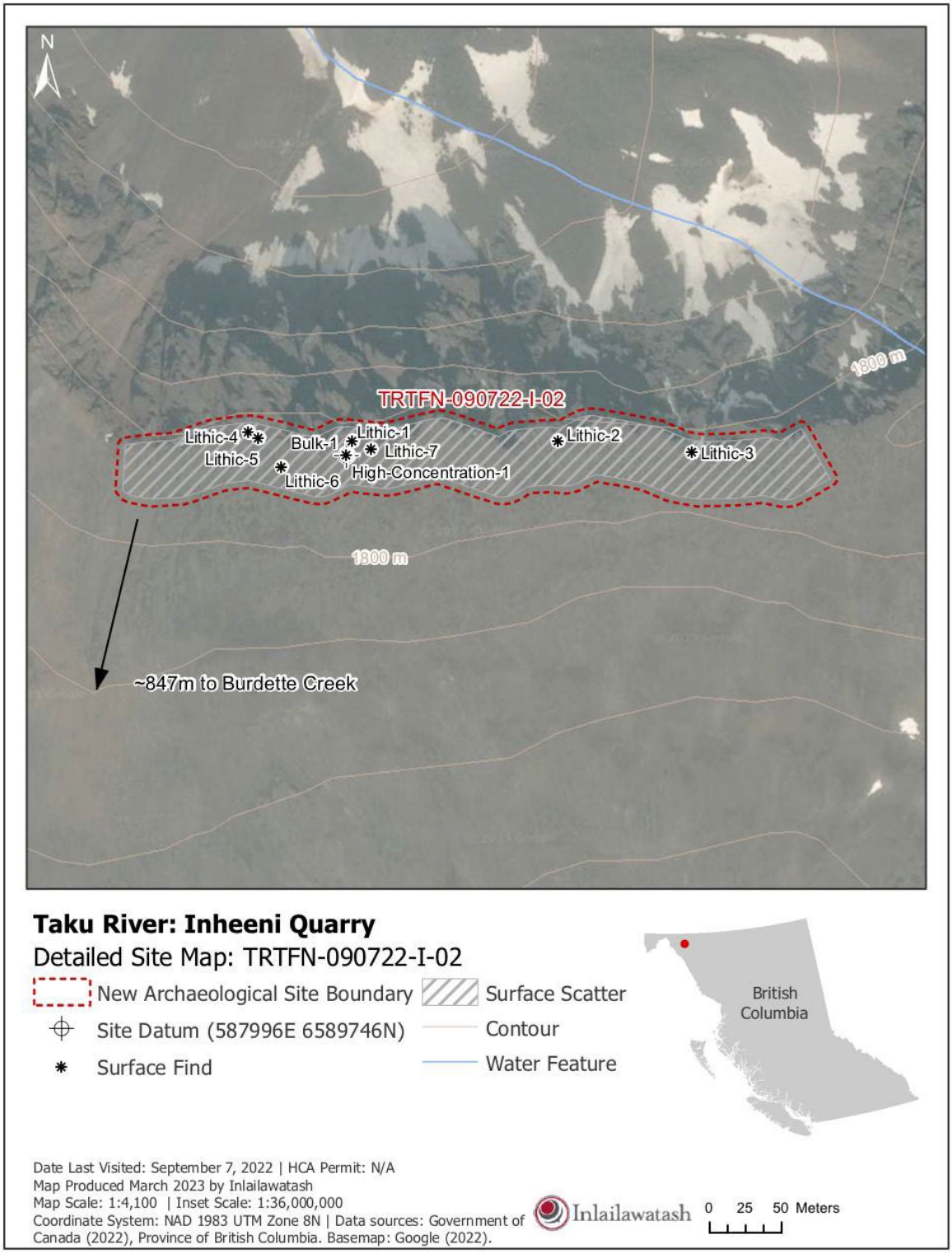

Fig. 45. detailed sitemap of IiUi-2

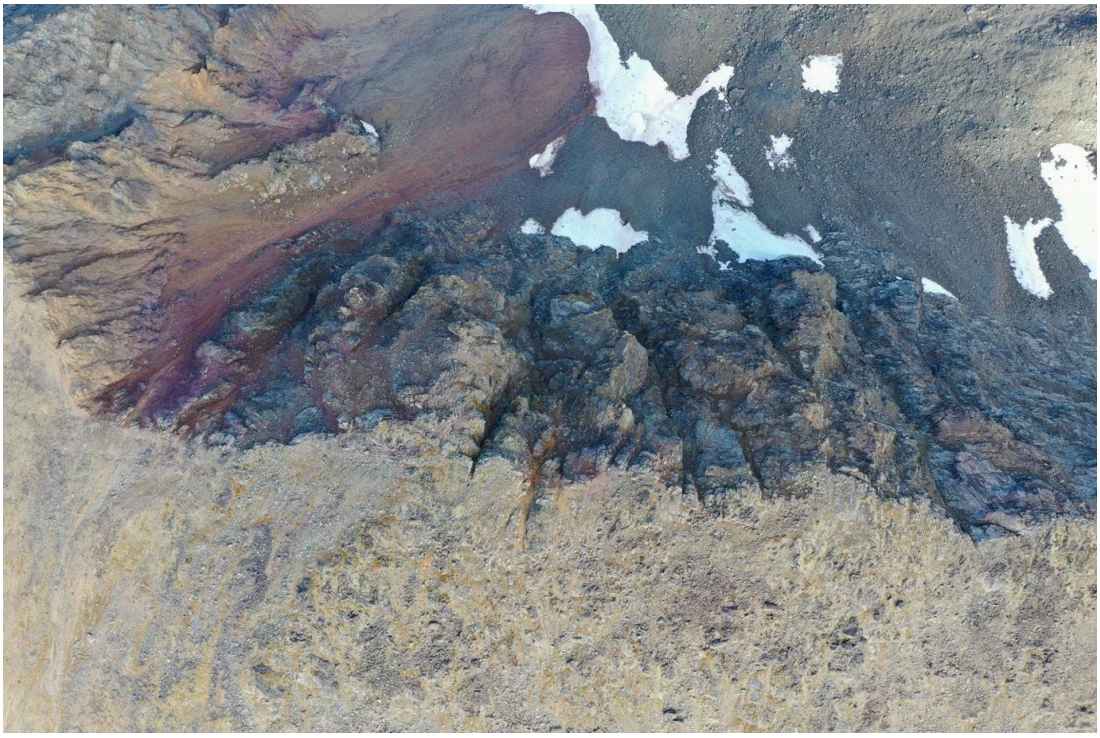

Fig 46 Siliceous chert deposits are plentiful in this mountain range. Photo by author

Fig. 47 Barb Dawson (TRTFN) with a handful of culturally modified Ínhéeni chert flakes

Fig. 48 culturally modified Ínhéeni chert flakes at IiUi-2. Photo by author

Fig 49 Chert preform from IiUi-2. Photo by author

Fig. 50 Retouched flake tool, ventral view. Photo by author

Fig. 51 Retouched flake tool, dorsal view. Photo by author

Oral histories: From Jackie Williams in his second publication "Yáx Góos: The Cloud on The Face Of The Mountain": "Tlingit people would drive herds of caribou from the Blue Canyon area down McKee Creek [Ínhéeni] towards the fence…. The fence was constructed so that caribou would be funnelled towards an area where slots were strategically located in the fence. As the caribou squeeze through the slots, people were able to spear them. This was before people had guns. Remember, there were a lot more caribou around in those days. This area was not forested, and the people would have to go a ways to get wood to build the fence. A large number of smokehouses (more than 10) were located near the fence where the forestry campground is located now. People would all get together to plan how they would get food (in Tlingit, *Woochnáx Wutoodi.aat* means "we all get together"). Men would spear the caribou, women and children would cut the meat, older boys would hang the meat, and kids would get the firewood" (Williams 2023:43).

Mt Munroe (Birch Creek) -IjUj-27

Fig. 52. Mount Munroe -IjUj-27. Photo by author

Temporary site# TRTFN_20220915_BirchCr
Borden Number: IjUj-27
Crew: James Williams (TRT elder), Trevor Williams (TRT), Ben Louter (archaeologist)
Permit Number: 2021-0185

Description: Site is located on an alpine ridge just above the treeline and south of John Creek, approx. 10km east of Atlin, BC. Located on the Mt. Munroe massif. Predominantly rolling hills with small rock outcrops on the summit ridge. Excellent caribou habitat. The site was located at a rock outcrop with an excellent view of the surrounding landscape including Jánwu X'áati (Theresa Island) and Aa Tlein Shaa (Atlin Mountain) A hunting blind has also been constructed at this site. Vegetation consisted of dwarf birch, grasses, and alpine succulents. Very little soil development. Yanyeidí clan leader James Williams and his son Trevor Williams were out hunting caribou up on Mt. Munroe, when Trevor noticed a small piece of obsidian debitage behind a modern hunting blind.

Fig. 53 Midrange sitemap of IjUj-27 Mount Monroe (Birch Creek)

Fig. 54 Detailed sitemap of IjUj-27Mount Monroe (Birch Creek)

Fig. 55 Aerial view of IjUj-27

Fig. 56 Field photo of IjUj-27. Photo by author

Oral histories:

No specific oral histories about this site are known.

Granite Creek - IkUg-3

Fig. 57 Aerial view of IkUg-3

Temporary site# TRTFN_20220914_GraniteCr
Borden Number: IkUg-3
Crew: Trevor Williams (TRTFN), Ben Louter (archaeologist)
Permit Number: 2021-0185

Description: Site was located approximately 2 km south of Lingít Shéyi Shaa (Four Crown Mountain), while Koosawu Aa (Surprise Lake) is 1km to the East. The traditional Tlingit trail to Déináx Áayi (Gladys Lake) is well defined. The site is approximately 8 km from the house depression IkUh-02. During a survey of adjacent alpine areas, Trevor Williams and I recorded a bifacially flaked chert knife near the outlet of Granite Creek, which flows into Koosawu Áa (Narrow Lake). There is a well-defined trail into the alpine. The artifact was located close to Granite Creek, an easy access corridor into the alpine. The vegetation consists of pine, willow, dwarf birch, fireweed, and kinnickinnic.

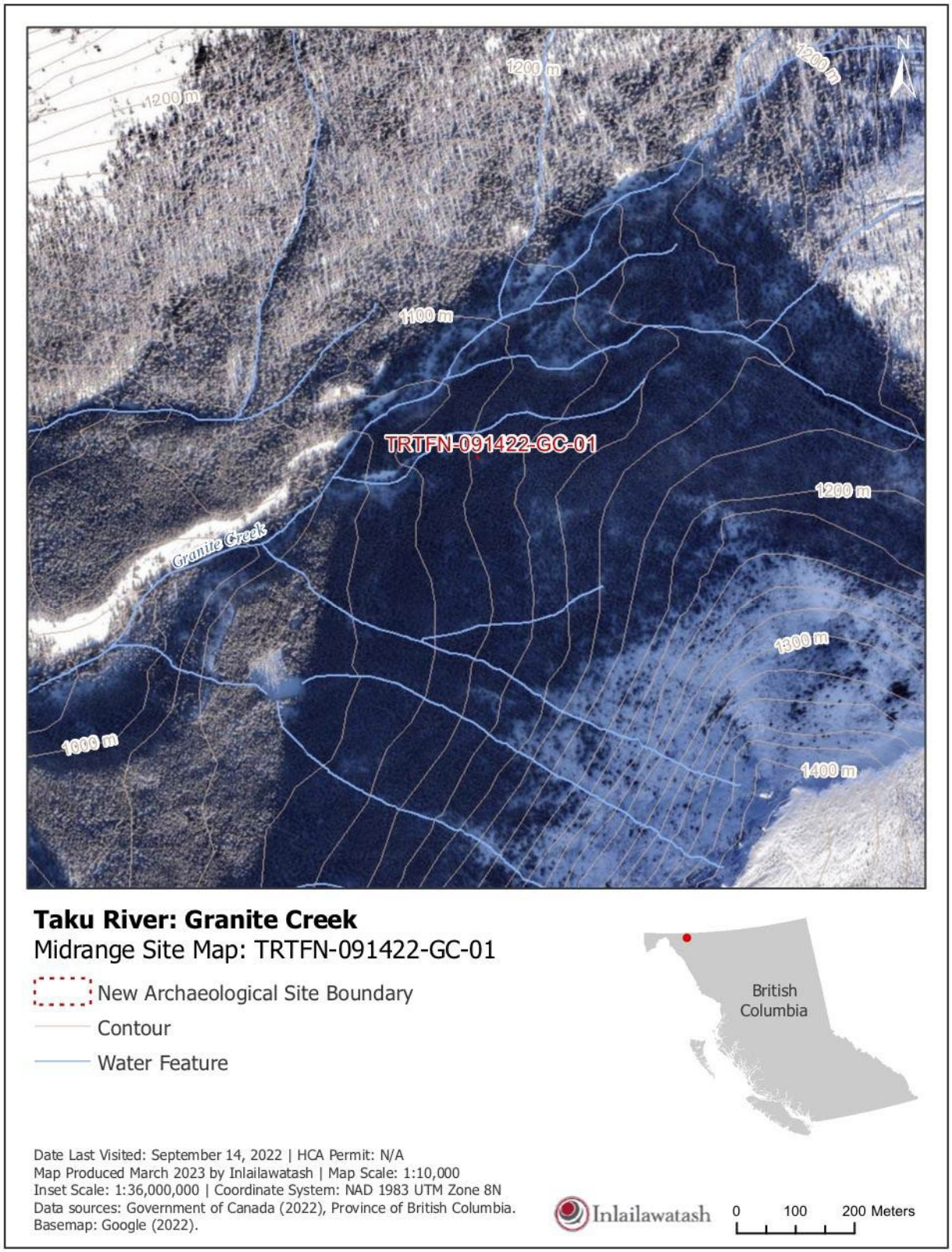

Fig. 58 Midrange site map of IkUg-3

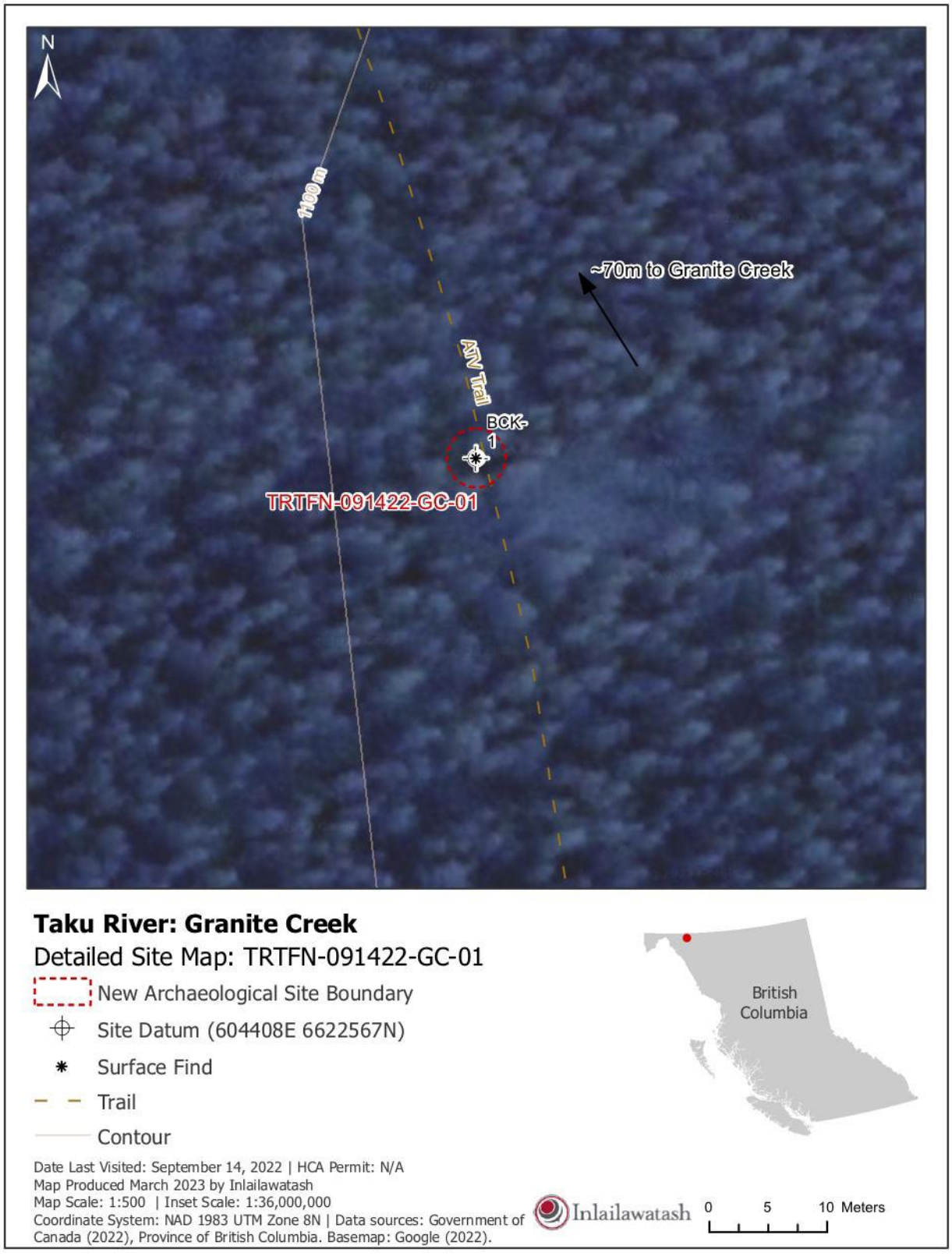

Fig. 59 Detailed site map of IkUg-3

Fig. 60 Biface in situ

Fig. 61 Dorsal surface in situ

Fig. 62-63 IkUg-3 Chert biface - dorsal and ventral views. Photo by Maria Vigneron

Oral histories:

While no specific oral histories about this site are known, the site is at the nexus of several Lingít toponyms, as discussed in the "description" section. There are oral histories about Lingít Shéyi Shaa, described in the Koosawu Áa (Narrow Lake) - IkUh-02 site entry that are relevant due to the close proximity of this site.

Séik'u Héeni (Horsefeed Creek) - IgUf-6

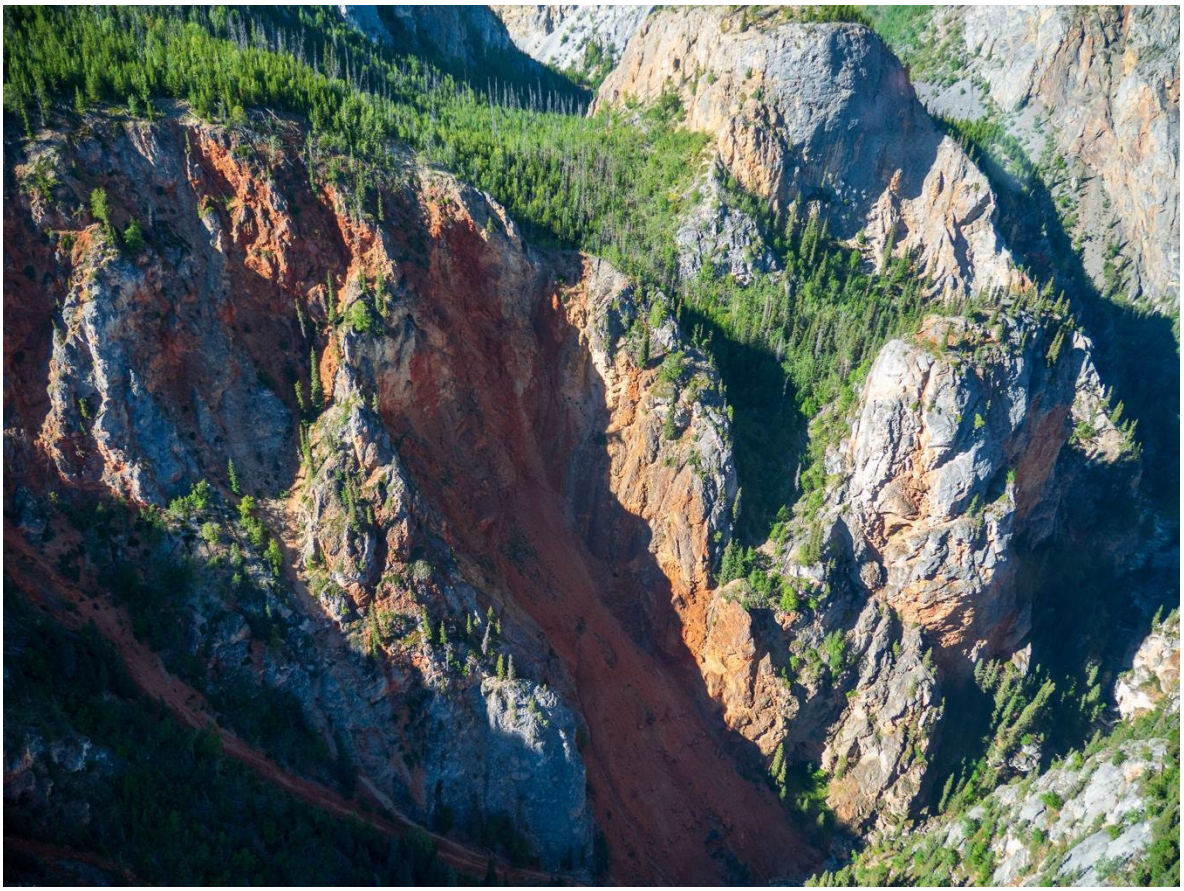

Figure 64 Séik'u Héeni (Horsefeed Creek) ochre quarry- IgUf-6. Photo by author

Temporary site# TRTFN-081822-01 Horsefeed Creek Canyon Ochre Quarry
Borden Number: IgUf-6
Crew: Wayne Carlick (TRT Elder) Debrah Michel (TRT Elder) Luke Westley (TRT), Aaron Blake Evans (archaeologist), Ben Louter (archaeologist)
Permit Number: 2021-0185

Description:

Located 65 km south of the town of Atlin. This red ochre quarry is located on the western cliffside of Horsefeed Creek. This creek flows into the Nakina river from this site approximately 740 m to the northeast. In the Lingít language, the quarry site is called "Séik'u Héeni", which translates as "red/orange creek." The site is closely associated with and 4.25 km west of a village site at the confluence of the Nakina and Silver Salmon rivers known in Tlingit as Tatlenx'ixoo (translated as "Bestrewn with big rocks") located within Taku Indian Reserve 6 and registered under Borden numbers IgUf-1, -2, and -3. Also closely associated with this quarry site and approximately 3.15 kms north from Séik'u Héeni is the mountain Sinawa Eddy. The Lingít name for the mountain is "Sinwaa Yádi Shaa" which means "little limestone mountain." The canyon is located near the Nakina River, 4.3 km east of Taku Indian Reserve 6. Eroding canyon banks of limestone and metamorphic rock containing mineralized iron oxide.

Séik'u Héeni Horsefeed Creek Red Ochre Quarry has numerous notable red ochre exposures. On the incredibly steep cliff faces and slopes, fine powdery, red ochre exposures are concentrated. Only one western segment of Horsefeed Creek Canyon was chosen for direct archaeological mapping and conservation due to the site's remoteness and present protection within the Nakina – Inklin Rivers/Yáwu Yaa Conservancy, which was established as a result of the Wóoshtin Wudidaa Atlin Taku Land Use Plan. Following discussions with the Archaeology Branch, the whole western portion of the Séik'u Héeni/ Horsefeed Creek canyon was enclosed in a single polygon that had borders created naturally using the canyon walls.

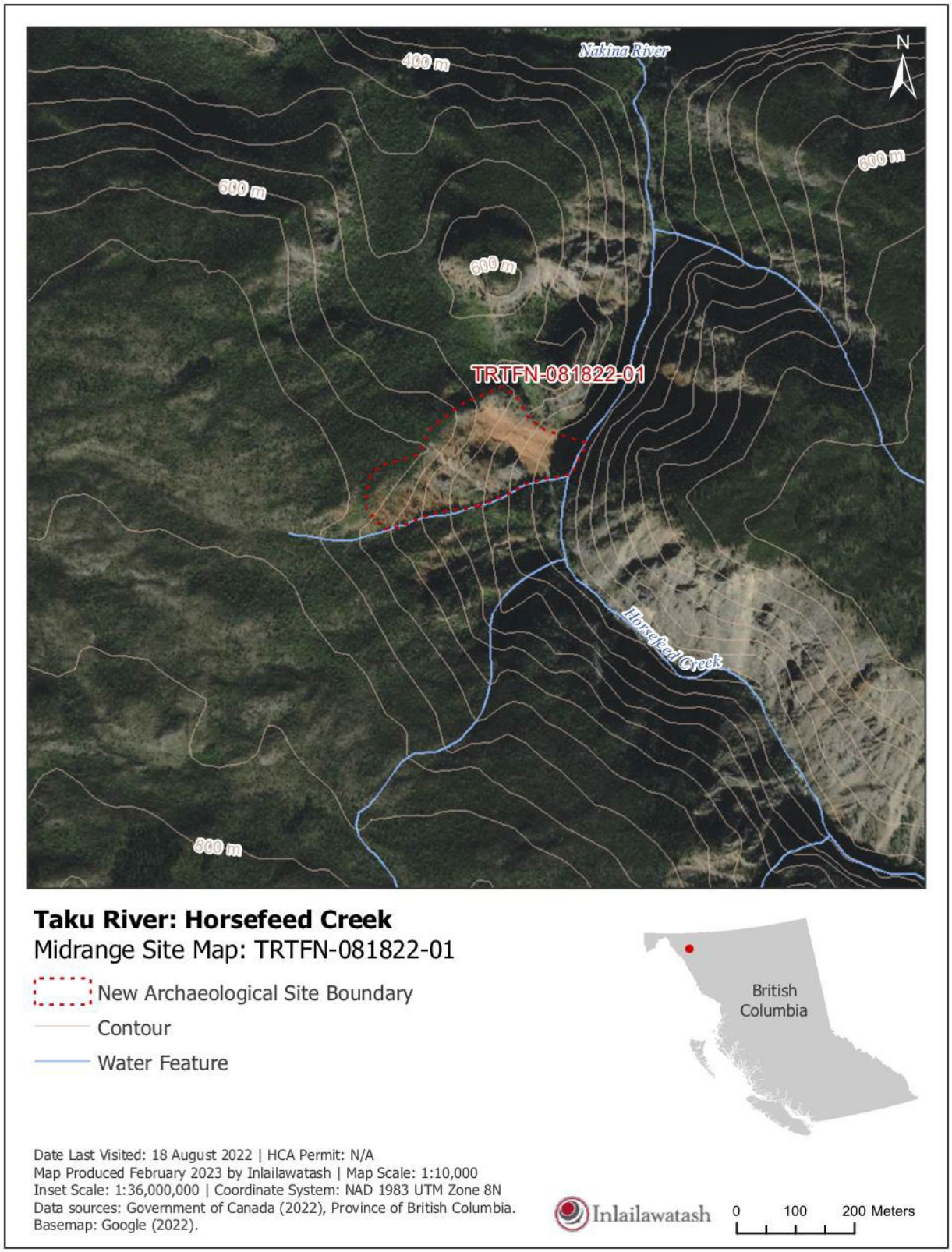

Fig. 65 Midrange site map for IgUf-6 Séik'u Héeni (Horsefeed Creek) ochre quarry

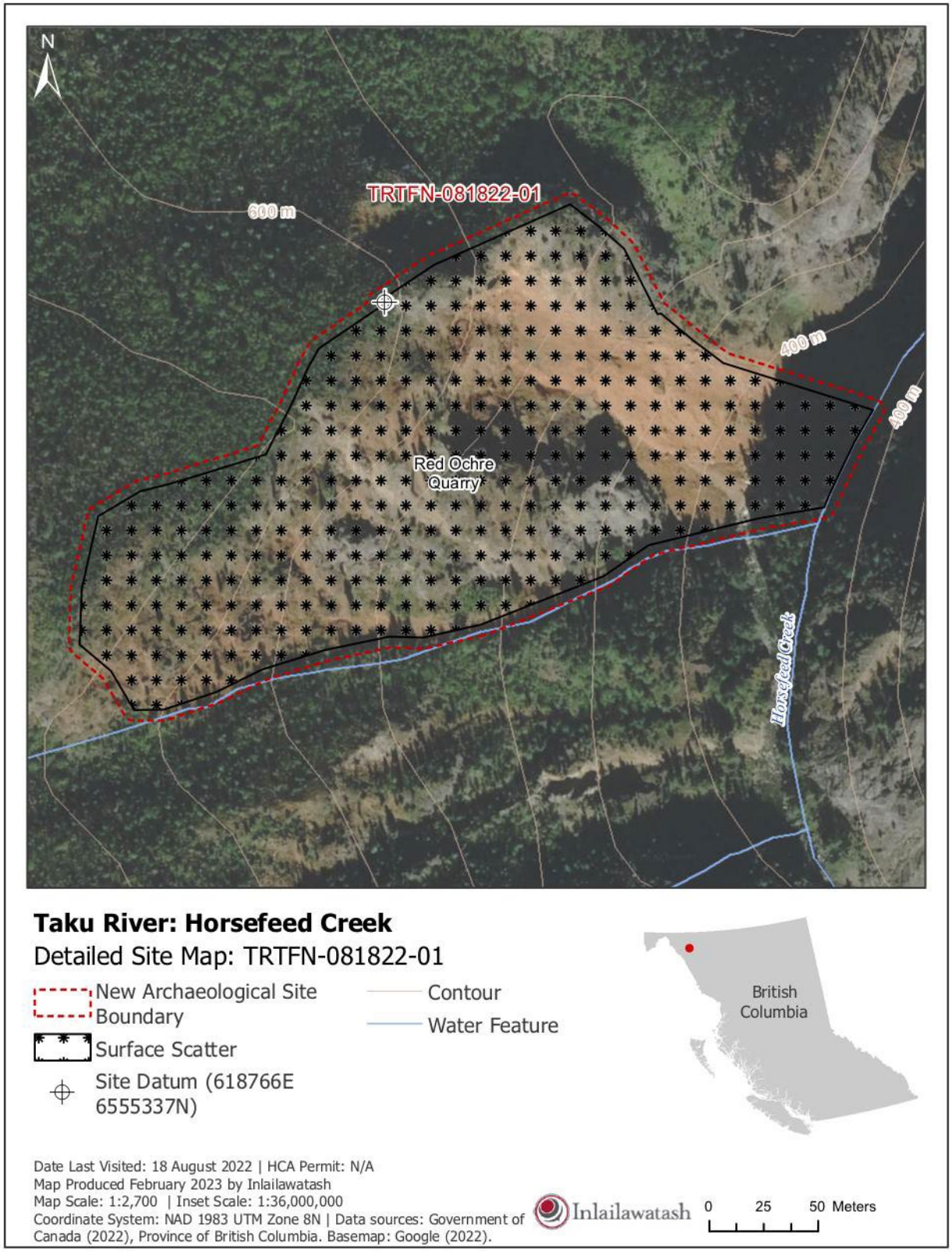

Fig. 66 Detailed site map for IgUf-6 Séik'u Héeni (Horsefeed Creek) ochre quarry

Oral histories

T'aaku Kwáan elder Yáx Góoś (Jackie Williams) described the location of this ochre quarry, as well as how it was traditionally used. Yáx Góoś's description of this site was added to the trt.geolive.ca interactive map in 2013. He noted: "There are two sites where Tlingit used to collect paint. One site is Séik'u Héeni (red/orange creek) called Horsefeed Creek in English. There is another site located on a creek upstream as well. These sites were used by the Tlingit to obtain paint for pictographs such as the one of the canoe on the Taku River" (Taku River Tlingit First Nation 2013). The pictograph that Jackie Williams is referring to on the Taku River is located on a mountain called Sinwaa du dachxán, which means "Limestone Granchild" (Williams 2023).

Fig. 67 Canoe pictograph on Sinwaa du dachxán (Limestone Grandchild) on the lower Taku River. Photo by author

The pictograph on Sinwaa du dachxán, Williams describes, is “on the yakwdeiyi, meaning ‘boat trail’ on the West side of the Taku River along a side channel that flows along the base of a steep limestone cliff approximately 700 meters upstream of the outlet of Sinwa Creek. This picture is a marker for the Tlingit people and was placed here when they initially came up [the Taku] river after the glacier receded” (Williams 2021: 38).

There is another similar ochre pictograph illustrating two canoes with occupants close to the Tatlenx'ixoo village site on the Nakina River. This site was recorded by archaeologist Diana French, along with Taku River Tlingit elder Bryan Jack (French 1974b).

Describing some of the uses of ochre, frequently referred to as “paint”, Jackie Williams remarked: “This paint was also collected and then used to barter with [Tlingit communities] in Alaska as it was not readily available there. The red paint was mixed with black (charcoal) or alkali (white) to create different colours. This paint may also have been used to stain the glacier at the lower Taku to get it to melt (there is a Tlingit story about this). People would paint their faces for ceremonies or warfare. During ceremonies, if people didn’t have a mask, they would use paint. This paint was considered to have protective power because it came from Mother Earth. It was the slaves that collected the paint. The slaves would use babiche as rope to lower themselves into the canyon to scrape the stain off the rock. Sometimes during heavy rain the Nakina River flows a reddish color possibly due to the red stains at Séik’u Héeni washing into the creek” (Taku River Tlingit First Nation 2013)

Fig. 68 Recently quarried Séik'u Héeni (Horsefeed Creek) ochre, harvested for community use as well as analysis. Photo by author

Tlingit ochre use in the ethnographic record

Ochre, sometimes referred to simply as 'paint', is a substance that is remarkably versatile in its uses in Tlingit cosmology. It serves both in the most ordinary and simultaneously in the most sacred and ceremonial functions. Ochre has been used for tanning hides, treating snowshoes, arrows, and hide canoes, and it also proved to be an effective form of sunscreen (McClellan 2001). Ochre also has significant spiritual qualities. It has historically been used to paint totem poles, masks, rattles, and bentwood boxes, and it continues to be used in this fashion in the present. Echoing the ceremonial uses articulated earlier by Jackie Williams, McClellan noted, "The Inland Tlingit paint their faces for one day with either red ochre or charcoal if there is a death in the family…. Men, women, and children all painted themselves in this way. Each [clan] owned special designs for face paintings which they used for formal dances at potlaches"

(McClellan 2001:321). The clan owned designs are an example of At.oow (sacred clan property) (Worl 1998).

Interpretation

To what extent do Taku River Tlingit oral histories align with the archaeological record, and what implications does this have for understanding the region's history?

During the research phase prior to conducting any alpine archaeology, I studied the publicly available oral histories and Łingít toponyms that are available on the trt.geolive.ca website. The website interface is an interactive map, similar to ArcGIS. It allows users to toggle between different layers of data, such as significant places in the Lingít language, locations of clan Kwéiyi (arborglyphs), and the storied geography shared in Jackie Williams' books. The knowledge that informed the creation of the geolive website was gathered over generations by Taku River Tlingit citizens, such as Alice Carlick, Keith Carlick, Terry Jack, Nicole Gordon, Louise Gordon, Wayne Carlick, Ed Anderson, Susan Carlick, Bryan Jack, Vivian Mahoney, Andrew Williams, Jackie Williams, Mary Anderson, Antonia Jack, and many others (Taku River Tlingit First Nation 2013). Technical support from Nick Blackwell, Mark Connor, Jon Corbett, Tara Grant, David Lacho, Colleen Larson, Emily Millard, Anna Schmidt and Dr. Christine Schreyer collectively facilitated the creation of the digital platform. While the creation of the website digitized and made public a great deal of Lingít place based knowledge, it is important to recognize the decades of work, in the form of community interviews, traditional use and knowledge mapping that laid the foundation for the interactive digital tool that is now available publicly. The other oral historical resources frequently cited in this thesis are Jackie Williams' books *Lingít Kusteeyí: What My Grandfather Taught Me* and *Yáx Góoś: The Cloud on The Face Of The Mountain* and Elizabeth Nyman and Jeff Leer's book *Gagiwdul.at: Brought Forth To Reconfirm: the Legacy of a Taku River Tlingit Clan*. Tlingit knowledge keepers and elders were also part of the field assessments, and several sites were chosen due to the fact that they had been used ancestrally.

The Taku River Tlingit oral histories discussed in this thesis are consistent with the archaeological record, as evidenced by research and fieldwork in the Taku and Yukon River watersheds. The oral histories, passed down through generations by Taku River Tlingit elders,

contain critical knowledge about the region's history, traditional land use, and specific sites. The oral historians, such as Jackie Williams and Elizabeth Nyman, played a crucial role in facilitating previous archaeological work in the area by providing insights and guiding the selection of sites to be explored.

Although not made explicit in the field reports, it is now clear to me that the vast majority of previous archaeological work completed in the Taku basin was accomplished due to the knowledge carried (and shared) by oral historians Jackie Williams (Yáx Góoś) and his mother, Elizabeth Nyman (Sédayá) (French 1974b, 1976). Archaeological projects in the 1970s in the Taku basin led by archaeologist Diana French were facilitated by the oral histories of Jackie Williams and Elizabeth Nyman. Both Williams and Nyman were hired as field support staff and are listed as such in French's reports. The books that Williams and Nyman later published revealed that virtually all of the sites that French recorded were connected to oral histories and ancestral use. While French was able to record dozens of sites during the course of the various projects that she worked on with the Atlin Indian Band (now the TRTFN), dozens more remain unrecorded and unprotected to this day, although there is little doubt that all pre-date 1846. Further analysis along these lines have revealed the extent to which oral histories have informed archaeological "discoveries." Upon reading the Remote Access to Archaeology Database report for the pictograph at IiUj-01 (Yat'aayi Héen Geeyí -Warm Water Bay), first recorded by archaeologist M. Howat in 1962, I learned that the site was located due to an oral history, referred to as a legend at the time of publication (British Columbia Archaeology Branch 2023). In his report to the Archaeology Branch, Howat noted: "Legend is the chief, knowing his tribe was in danger of starvation, ordered his men to find caribou, then built a fence from the lake to the mountain. The animals were driven into the fence" (British Columbia Archaeology Branch 2023:3). Although Howat's Tlingit informant goes unnamed, the history mirrors those of Jackie Williams (Yáx Góoś) perfectly. The use of nomenclature is significant. The Merriam-Webster dictionary defines "legend" as: "a story coming down from the past, especially: one popularly regarded as historical although not verifiable ex. the legend of a lost continent." While a great deal has changed in the past 60 years since Howat initially recorded From Rock as an archaeological site, the cultural shift to recognize oral histories for what they are- historical records- has yet to come to legal fruition in Canada.

While oral histories and the Lingít toponyms associated with them were given priority in terms of site selection for this project, other tools were used, particularly to locate ice patches with a cultural component. A predictive ArcGIS model shared by Christian Thomas of the Yukon Government Heritage Branch was used to identify cultural ice patches, as discussed in the "Archaeological Methods" section. It had been previously field tested in the Yukon, where there is a 20-year collection of ice patch data. High resolution SPOT satellite imagery was also used to identify ice patches with caribou dung present on the surface.

Due to the presence of strong La Niña systems in both 2021 and 2022, unprecedented precipitation levels set new snowfall records in the subarctic (CBC Yukon 2022). A deep snowpack in the alpine negatively impacted our ability to locate cultural ice patches. Ideal conditions for ice patch archaeology arise when all seasonal snow has ablated, and bare glacial ice remains. Organic artifacts and ecofacts typically reside on top of multiyear glacial ice and are invisible so long as they are buried under seasonal snow. While we were able to survey numerous ice patches with seasonal snow that had sufficiently melted, many alpine cirques that had been identified as having high potential were covered in deep seasonal snow, even at the end of August when maximum melt had occurred. As a result, we decided to reduce the scope of the ice patch work, while focusing more attention on alpine use areas, such as subalpine camps, butchering sites, as well as quarries and lithic reduction stations.

In the suite of fieldwork that we completed, oral histories played a critical role in the identification of archaeological sites, and frequently added valuable nuance pertaining to the role that individual sites occupy in T’aaku Kwáan metaphysics. Some sites, such as IgUf-6 (Séik’u Héeni - Red/Orange Creek) and IiUi-2 and IiUj-15 (Ínhéeni - Flint Creek) were selected for survey because there are explicit Lingít oral histories or toponyms that pointed to a clear usage. As discussed earlier in the ‘Results” section, engagement with source material revealed to me that Ínhéeni is the creek whose headwaters begin on the flanks of Shaax'wáas Shaa, which translates to “flint creek.” Flint, also known as chert, is a type of fine-grained cryptocrystalline rock that is highly siliceous. Its conchoidal fracture pattern make it ideal for stone tool manufacturing. Jackie Williams’ (Yáx Góoś) histories concerning both the headwaters of

Ínhéeni, Séik'u Héeni and Yat'aayi Héen Geeyí are very specific. He carefully outlined not only how each site was used, (harvesting caribou via caribou fences, ochre quarrying, smoking meat etc.) but equally important, how communities organized socially to accomplish various tasks. In the history of Séik'u Héeni (Horsefeed Creek) ochre quarry Williams again discusses not merely a harvest area, but how, why, and when ochre was used in Tlingit society, and why it was (and continues to be) culturally significant for activities both ordinary and simultaneously, sacred. The fact that ochre carries protective power, and is intrinsically linked to ceremony, is very significant. Williams describes how oche was also used to create pictographs, such as the one located at Sinwaa du dachxán (Limestone Grandchild). Both the act of creating pictographs, and ceremony (both of which are connected to ochre) are connected to the creation of At.oow [sacred clan property] and are part of the Lingít legal system (Worl 1998). Pictographs and petroglyphs, along with Kwéiyi delineate clan boundaries and territorial ownership.

Other sites, such as the house depression on Koosawu Áa (Surprise Lake) were triangulated between multiple important repositories of oral knowledge. The subalpine house depression was both near a named lake with abundant freshwater fishing opportunities, at the base of a prominent mountain (Lingít Shéyi Shaa) with its own specific history, and immediately adjacent to the Tlingit trail to Déináx Áayi (Gladys Lake). The oral history connected to Lingít Shéyi Shaa, (see page 83) which is in close proximity to both IkUg-3 and IkUh-02, describes how a young Tlingit man is pushed out of an eagle's nest – to his death – after he acts disrespectfully towards the eagles. The unintentional sacrifice of a clan member's life to a non-human community (eagles in this example) is another example of the creation of At.oow (Worl 1998). In many analogous examples in southeast Alaska, this type of involuntary sacrifice was often connected to a transfer of territorial or harvesting rights to a specific clan (Thornton 2011).

While I was unable to find an oral reference to the house depression itself, that isn't entirely shocking. While there are named clan houses in the territory, such as Yayuwaa Hít on the Taku River, the pit houses that were built in the interior were often more expedient in nature, and they were typically not used generation after generation like the wood plank longhouses on the river (McClellan 2001).The sites described above all have a very direct relationship to the oral historians who recorded their knowledge. In fact, these traditional use areas would have

remained unknown to archaeologists if not for the dedication of the dozens of individuals mentioned earlier who were responsible for the collection, collation, and publication of various types of oral knowledge.

While the importance of some sites was known already in the pre-fieldwork phase, several sites were located by Tlingit knowledge keepers while we were conducting field assessments. TRT knowledge keeper Terry Jack identified the camp at Dliwoowoo Shaa (Cathedral Mountain) as a staging area for hunting mountain goats and sheep. Terry spent many years recording interviews with an older generation of elders for the purpose of land use planning, and he was also heavily involved in mapping traditional use areas in the 1980's. The site that we recorded was in the immediate vicinity of a named place, Dliwoowoo Shaa (Lingít "the mountain that shines"). Unlike Ínhéeni/ Flint Creek, which possesses a toponym that is hard to misinterpret, the toponym of Dliwoowoo Shaa alone did not immediately reveal how ancestral Tlingit populations had engaged with it as a place. The sites recorded at Birch Creek (IjUj-27), and Mount Switzer (IiUn-5) fell into the same general pattern. I was unable to find specific Tlingit toponyms or oral histories for either Birch Creek (IjUj-27) or Mount Switzer (IiUn-5). Further research into the oral histories of Elizabeth Nyman and Jackie Williams did not reveal any more information about these places. This study did not delve into the thousands of unpublished interviews that are on file at the TRTFN Heritage office, and I sourced only published material, in the interest of presenting a sample of what is already available to CRM companies and researchers. Additional research into the unpublished oral histories would no doubt reveal deeper layers of nuance and history.

It is critical to consider how much knowledge was lost due to the assimilationist tactics employed in the Canadian residential school system, and colonial laws designed to prevent cultural knowledge transmission. However, there are ongoing efforts to revitalize, transcribe and digitize the recorded oral histories and new information about these sites (and others) may yet be revealed in the years to come. Dozens of Lingít toponyms have been rediscovered in the oral histories, along with oral knowledge about each place within the last year. They are being added to the trt.geolive.ca website. Out of the 9 new sites we recorded, 7 are associated with either an oral history, a Lingít toponym, or both.

This study revealed a strong correlation between oral histories, Lingít toponyms, and archaeological sites in Taku River Tlingit territory. Oral histories and Lingít knowledge provided a much more reliable metric for identifying sites than computerized models, which did not reveal any new archaeology sites. This is in sync with the findings of other researchers (Yellowhorn 2002).

What challenges or limitations exist in using Taku River Tlingit oral histories to inform archaeological research and site preservation, and how can these be addressed?

The fact that heritage legislation in British Columbia does not require the inclusion of oral perspectives, nor does it provide mechanisms that allow for the protection of these sites, is one challenge facing Indigenous people today. In the United States, there has been more emphasis on the inclusion of oral histories in the context of archaeology since the introduction of NAGPRA in 1990 (Echo-Hawk 2000). Similar federal legislation is yet to be introduced in Canada. The distribution of authority between the federal and provincial governments in Canada establishes a constitutional balance that heavily favours the provinces in the domain of the cultural resource management (CRM) industry. Provincial governments have accepted archaeological definitions of cultural resources because they allow them to legally transfer any lingering Indigenous rights to artifacts by classifying them as resources, rather than property (Yellowhorn 2002). Despite the federal government's constitutional commitment to protect the interests of First Nations, it lacks the jurisdiction to legislate broad CRM legislation, which would impinge on provincial rights. The attitude of the Provincial government, which asserts that artifacts are cultural resources, and not cultural property, is anathema to many First Nations people, who view artifacts in their traditional territories part of their ancestral inheritance. Eldon Yellowhorn describes the relationship between First Nations people and heritage matters as "analogous to a trustee of an estate," however this relationship is blocked because of the assumed legal jurisdiction of the Province (Yellowhorn 2002:348).

While there are many public-facing archives of Taku River Tlingit oral knowledge, many Indigenous communities may be unwilling to share their knowledge with archaeological firms for a variety of reasons. There may be fears that the archaeologists will simply disregard cherished knowledge as myth or legend, as historically this has been the dominant framing by settler archaeologists in North America. Second, there may also be concern that oral knowledge may be misconstrued, as there are plenty of historical precedents for this type of behaviour. Third, communities may be hesitant to share oral knowledge, even if it means that additional archaeological sites will be discovered, as the province continues to maintain a paternalistic attitude when it comes to jurisdiction over Indigenous artifacts. It is my hope that policy will take a turn to uphold and affirm oral histories, while at the same time recognizing Indigenous ownership of the artifacts that are extracted from ancestral lands.

Other challenges to engaging with oral literature exist. In the oral texts that I encountered, I observed that oral histories and toponyms often contain information about vast geographic areas. On a practical level, this can be challenging, as archaeology is often focused on the particular. For instance, two sites were recorded in between Koosawu Áa (Narrow Lake) and Lingít Shéyi Shaa ("Indian Blood" mountain), which are geographically close to one another. However, Koosawu Áa is a large lake over 30 kilometers long and Lingít Shéyi Shaa is part of an extensive mountain cordillera. In other words, the landscape that we surveyed was huge, and often the cultural features were tiny in comparison. An oral history or a toponym are certainly not always a roadmap to archaeological sites or features. Having said that, in Indigenous cosmology there is very little if any distinction between an archaeological feature such as a house depression, and a non-archaeological feature, such as the Taku River (which elders describe as 'grandfather'), or a legendary mountain peak. Challenges within anthropology continue to present resistance to the widespread inclusion of Indigenous oral perspectives in archaeological research. Persistent skepticism surrounding oral histories stems from Western rationalist notions that prioritize objectivity, positivism, and empiricism, consequently relegating oral knowledge to a subordinate position. There has certainly been a sea-change in the way that anthropologists engage with oral histories in the past two decades, and there is in general much greater recognition of their importance as historical materials.

Conclusions

This suite of research conducted across Lingit Aaní has shed light on various aspects of the T'aaku Kwáan history, emphasizing the significance of integrating multiple sources of knowledge, including archaeological evidence, oral histories, and Lingít toponyms. Our archaeological fieldwork revealed a rich and diverse array of sites; these results both showcased the long-standing presence of Tlingit populations in the study area, and the durability of oral knowledge. The analysis of artifacts, features, and site distributions provided valuable insights into past human activities, subsistence strategies, and cultural practices. The archaeological findings of this study illuminate the dynamic nature of T'aaku Kwáan society and its adaptation to the local environment over time. Re-engagement with many ancestral sites including habitation sites, hunting camps, lithic and ochre quarries will contribute to ongoing cultural revitalization within the community.

Place based oral histories, passed down through generations by T'aaku Kwáan oral historians, provided crucial insights into the region's history, traditional land use, and specific sites. The correlation between oral histories, Lingít toponyms, and archaeological sites was obvious, indicating the reliability and historical value of oral knowledge. Oral histories informed the selection of sites for archaeological investigation and provided a deeper understanding of social organization, cultural practices, and the cultural significance associated with various activities. This level of detail was frequently absent in European ethnographies, especially in the early 19th-century material.

Alpine sites without an oral history component were also recorded, as there are many mountains that are unnamed (or else their names are not currently known). This is consistent with naming conventions in other Lingít communities (Thornton 2012). Sites without toponyms or histories, including IkUg-3, liUn-5, and IjUj-27 are equally significant as they demonstrate holistic, landscape level cultural use, rather than land use prescribed to a narrowly defined geographic area. This suite of alpine research demonstrated that oral histories and the use of toponyms provided a more reliable metric for identifying and interpreting sites than the computerized

model we used to augment the study. The alignment between oral histories and archaeological discoveries reinforced the historical value of oral traditions, challenging previous perceptions of them as mere legends or stories. The research also highlighted the critical importance of ongoing efforts to revitalize and preserve recorded oral histories, offering the potential for future discoveries and a deeper understanding of the region's past. Another key takeaway is the current lack of provincial support in terms of heritage protections for sites recorded in Indigenous oral histories. Provincial heritage legislation that fails to take oral histories into consideration in a meaningful way will continue to dispossess Indigenous communities of their material culture and history. The recognition that oral histories are, in fact, historical documents must be taken into consideration by professional archaeologists and provincial legislators.

The ethical implications of neglecting Taku River Tlingit oral histories during the construction of archaeological sites are manifold. While there has been some momentum in the past 20 years to include more Indigenous perspectives in the discipline of archaeology, a great deal of work is still required to disentangle oral histories from the net of colonial doubt that has been cast over all Indigenous lifeways for the past five centuries. It is critical to keep in mind that the Canadian state fiercely suppressed Indigenous oral histories, language, traditions, spirituality and systems of government through the residential school system, the imposition of the Indian Act of 1876, the Potlatch Ban (1884 to 1951), the 60’s Scoop, and through many other colonial mechanisms. The intention of these measures was to sever Indigenous peoples from their land, history, spirituality and from one another. The violent actions and policies created by the Canadian state have been widely described as genocidal. In 2019, Canadian Prime Minister Justin Trudeau admitted that the relationship between the Canadian state and Indigenous peoples was in fact, genocidal. Erasing Indigenous languages and histories was a deliberate aim of the colonial state. The Taku River Tlingit community retained a substantial amount of oral knowledge due to systematic efforts to record, transcribe, and in some cases, publish the oral histories of prominent elders who were able to escape the clutches of the residential school system. There are very few Lingít speakers left in Atlin. Recent efforts by the Children of The Taku Society (COTTS) to revitalize the language have had great success in creating fluency; however, huge challenges remain.

A recapitulation of normal science that is absent of Indigenous perspectives can only reproduce colonial epistemologies, theories and typologies. As discussed in earlier chapters, throughout time archaeologists and anthropologists have keenly observed oral histories for the purpose of establishing their own theories, while at the same time dismissing them as credible sources of historical knowledge. In the world of professional archaeology consulting in British Columbia, there is no incentive for Cultural Resource Management firms to engage with oral histories in any substantive way. While CRM archaeology is not known for producing nuanced interpretations of archaeological sites, it is worth drawing attention to the implications of this void in knowledge, as CRM constitutes the vast majority of annual archaeological projects, I would estimate over 90% of the total.

Many scholars have observed that oral histories and toponyms are often mnemonic maps of a landscape (Cruikshank 1994; Echo-Hawk 2000; Martindale 2006; Yellowhorn 2002). That is certainly true in T'aaku Kwáan territory (Taku River Tlingit First Nation 2013). These sites include villages, fish camps, gathering sites, places where wars were fought and peace was made; sacred landscape features such as mountains and rivers and locations where supernatural events took place. The Heritage Conservation Act requires professional archaeologists to circumscribe the sites that they encounter to the narrowest extent possible- typically just a few meters beyond the last artifact found on a landscape feature. The rules pertaining to academic archaeology are different, but academic archaeology forms a tiny percentage of the annual total. Reducing Indigenous cultural sites to a few scattered polygons is not only insulting to Indigenous peoples, but it also facilitates further appropriation of land and resources by states and corporations. Landscapes and non-human entities are viewed as animate beings in many Indigenous cosmologies, and they are frequently depicted in relational terms in oral histories (Cruikshank 2005; Nyman et al. 1993; Williams 2006). When describing the process of leaving an appropriate offering, Jackie Williams (Yáx góos) remarked "The Taku River is my grandfather, but it is everyone's grandfather as well. We all need to respect it as our grandfather" (2006:26). This view of reality asserts that the entire landscape is considered an animate, responsive being, and a relative. This is at odds with the western scientific view that cultural sites can be narrowly defined as the artifacts, features and physical evidence of occupation. The

bottom line is that the HCA is not designed to protect Indigenous culture or rights, it is designed to optimize the collection of data for future scientific inquiry.

According to the HCA, the Provincial Government of B.C. claims sovereignty over all cultural materials that pre-dates 1846 (Province of British Columbia 2022). The definition of an archaeological site in the HCA is "a site that contains artifacts, features, materials or other physical evidence" (Province of British Columbia 2022 section 12.2 subsection g). For those familiar with the historical timeline of the province, it goes without saying that well over 90% of all cultural material found in British Columbia that pre-date 1846 are Indigenous in origin. The assumed jurisdiction by settler governments over Indigenous cultural sites and landscapes (and land in general) is certainly a thorn in the side of modern Indigenous people. The decontextualization of Indigenous cultural/ archaeological sites into data points, and then their subsequent recontextualization as sites of scientific inquiry also creates distance between archaeologists and Indigenous peoples. There is a very direct relationship between the creation of an 'archaeological site' and the dispossession of unceded Indigenous territories. Once a site is identified and its extent narrowly circumscribed as per HCA stipulations, artifacts can be safely evacuated to a designated repository. The artifact(s), once discovered, become Crown property. There are only a handful of designated repositories in British Columbia, so if you are Indigenous, and you live in a remote community, you will likely never see the objects and tools that your ancestors created. This, sadly, includes all of the cultural materials that we recovered during this research project. According to provincial law, the artifacts discovered during this project must be turned over to the Royal BC Museum. The process of establishing a repository is also inaccessible to most First Nations due to a lack of financial support. Qualified archival staff are required by the BC Archaeology Branch, as are large amounts of building space, costly shelving, the ability to serve as a repository to CRM firms working in the area, and an institutional emphasis on stewardship rather than ownership.

To illustrate the disregard that is shown both to Indigenous people and their oral histories by the Canadian state apparatus, I'll share a historical example. In 2004, Melvin Jack, on behalf of the Taku River Tlingit First Nation, filed a lawsuit against the Province of British Columbia (*Taku River Tlingit First Nation v. British Columbia (Project Assessment Director), [2004] 3 S.C.R.*

550, 2004 SCC 74.) for issuing a permit to Redfern Resources that would allow the company to build a road through unceded territory The road would have cut into the untouched Taku watershed, which is full of T'aaku Kwáan cultural/ archaeological sites. See trt.geolive.ca for more detail. The proposed road would have started in Atlin and ended near the confluence of the Tulsequah and the Taku rivers, where the proposed mine was located. The potential environmental and cultural impacts would have been enormous. In response, the TRT community recorded hundreds of interviews on the topic of traditional use areas, including cultural and/or archaeological sites. Ultimately, the concerns of the TRTFN were overturned, because it was ruled that the Province had met its duty to consult and accommodate. The Supreme Court recognized the area in question was important to the Taku River Tlingit due to the overwhelming collection of oral histories, personal testimonies, and ethnographic and archaeological data. However, the Supreme court ruled that "The Province was not under a duty to reach agreement with the TRTFN, and its failure to do so did not breach the obligations of good faith that it owed the TRTFN" (*TRTFN v. British Columbia* 2004 SCC 74, para. 2).

The Canadian and provincial governments will continue to act as an exploitative colonial force, so long as "reaching agreement" with Indigenous communities is an optional activity. Heritage legislation around archaeology which does not support and acknowledge oral knowledge sidesteps thousands of years of history that, according to UNDRIP, must be considered on par with the written word *(United Nations Declaration on the Rights of Indigenous Peoples Act, SC 2021, c 14)*

As of the year 2023, the Heritage Conservation Act is up for revision, with the stated goal of enhanced alignment with the UN Declaration on the Rights of Indigenous Peoples (Ministry of Forests 2023). How the proposed changes will be enacted remains to be seen. Articles 11 and 12 of the United Nations Declaration on the Rights of Indigenous Peoples state:

Article 11

"1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature.
2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual,

religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs" *(United Nations Declaration on the Rights of Indigenous Peoples Act, SC 2021, c 14 at Article 11).*

Article 12

1. Indigenous peoples have the right to manifest, practise, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains.
2. States shall seek to enable the access and/or repatriation of ceremonial objects and human remains in their possession through fair, transparent and effective mechanisms developed in conjunction with indigenous peoples concerned" (*United Nations Declaration on the Rights of Indigenous Peoples Act, SC 2021, c 14 at Article 12).*

Depending on how these provisions are codified into provincial legislation, there is certainly an opportunity for a much more equitable relationship between Indigenous peoples and archaeologists. Currently, Article 11.2 is being violated by the assumption of Crown sovereignty as stated in the HCA. Cultural, intellectual, religious and spiritual property are being excavated from unceded territories on a daily basis and taken far away. What exactly would 'consent' to having ancestral artifacts removed from the traditional territory look like? It could mean that First Nations, Inuit or Métis communities have the ability to retain artifacts in local communities, without having to travel thousands of kilometers to a state-run repository. Just like the Potlatch Ban, which outlawed the practice of ceremonies, or the ban on Indigenous languages in residential schools, the physical removal of artifacts from descendant communities continues to sever modern Indigenous people from their historical inheritance. In most cases, the context that oral histories provide are not even considered. The assumption that archaeologists can enter into an Indigenous community (whether academic or CRM), collect data and come to conclusions that are free of bias is simply untrue. In his widely read classic, "Custer died for your sins: An Indian manifesto," Vine Deloria Jr. critiqued the attitude of anthropologists, who frequently arrived on reserve without "a pen, pencil, chisel, stylus, stick, paint brush, or instrument to record [their] observations" because they already know what they will find" (Deloria 1969:73). Conversely, archaeologists could take steps to forge equitable relationships with Indigenous communities, by not only recognizing oral histories on a theoretical level and advocating for heritage policy change that would support this shift. I should mention that many archaeologists have already made calls for similar changes to the HCA.

Many Indigenous communities, including Taku River Tlingit, have extensive oral histories on file in the form of published books, Traditional Use Studies, interactive maps, as well as elders who are keepers of knowledge. Although there is detailed knowledge of the whereabouts of village sites, harvesting areas, sacred sites, and legendary places, the majority of these sites remain unprotected under the HCA, as the TRTFN have not historically had access to the hundreds of thousands of dollars that would be required to send a professional archaeologist to each location in order to verify what is already known. Many of the sites recorded in oral histories also may not have an archaeological component in terms of artifacts, features, or rock art. Until it becomes easier for First Nations to protect cultural sites in their territory, they will remain vulnerable to all types of industrial development regulated by the Provincial government. This is especially true for First Nations that do not have a government-to-government agreement, or a land use plan agreement with the province of BC.

There have been some encouraging signs of change recently. As of 2022, the S'ólh Téméxw Stewardship Alliance (the STSA) is participating in a pilot project with the provincial government under the Heritage Conservation Act (Ministry of Forests 2023). The agreement, which is the first of its kind, will provide protection for 45 sacred, spiritual and ceremonial sites. These sites would be considered 'intangible' under Section 4 of the HCA. Reflecting on the new agreement, Chief Angie Bailey of the Aitchlitz First Nation, which is a member to the S'ólh Téméxw Stewardship Alliance, remarked "For a very long time, the leadership of our organization, representing the 17 Stó: lō First Nation members of the S'ólh Téméxw Stewardship Alliance, have worked toward enhancing our decision-making authorities over activities that affect our lands and our resources. A particular focus has been protecting our sacred heritage sites, including our transformation places, our ancestral cemeteries and our places of cultural practice. These are some of our most sensitive and important places in S'ólh Téméxw (our world), which historically have been badly disrespected. This agreement marks an achievement in our efforts to gain greater recognition of our Indigenous culture and heritage, as well as our Indigenous rights as stewards" (Ministry of Forests 2023). Depending on how they are implemented, Section 4 agreements could mark the beginning of a new relationship between First Nations and the provincial regulatory bodies, namely the B.C. Archaeology Branch.

In summary, here are some key takeaways:

1. The colonial suppression of Indigenous knowledge and the genocidal actions of the Canadian state have resulted in the marginalization of Indigenous oral histories and their subordination as a form of knowledge when compared to science.
2. CRM archaeology lacks incentives to engage with oral histories, and there is a reliance on the assumption that data alone can provide a comprehensive understanding of archaeological sites.
3. Oral histories serve as mnemonic maps of landscapes and provide relational perspectives, contrasting with the narrow definition of cultural sites in the HCA.
4. The HCA grants provincial sovereignty over cultural materials, leading to the decontextualization of Indigenous cultural sites and the dispossession of Indigenous territories.
5. The legal system prioritizes consultation over reaching meaningful agreements with Indigenous communities, undermining the significance of oral knowledge and Indigenous rights.
6. Revisions to the HCA offer an opportunity to align with the UN Declaration on the Rights of Indigenous Peoples and establish a more equitable relationship between Indigenous peoples and archaeologists.
7. Protecting cultural sites in Indigenous territories remains challenging due to financial barriers and the lack of government agreements.

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Appendix - Radiocarbon Dating Methods[5]

All radiocarbon dates presented in this thesis were performed by the André E. Lalonde AMS Radiocarbon Laboratory at the University of Ottawa. Calibration was performed using OxCal v4.4 (Ramsey 2009) and the IntCal20 calibration curve (Reimer et al. 2020) or Bomb21 calibration curve (Hua et al. 2022).

Sample Processing

Sample pretreatment techniques, processing and definitions of media codes can be found in Crann et al. (2017) and Murseli et al. (2019). For more information about the equipment used for sample preparation, please see St-Jean et al. (2017). All manuscripts can be found at https://www.ams.uottawa.ca/research-publications/

Reporting of Data

In this analysis report, we have followed the conventions recommended by Millard (2014).

Radiocarbon Analysis

[5] The Radiocarbon Dating Methods section was prepared and written by members of the André E. Lalonde AMS Radiocarbon Laboratory at the University of Ottawa.

Radiocarbon analyses are performed on an Ionplus AG MICADAS (Mini Carbon Dating System). 12,13,14C+1 ions are measured at 200 kV terminal voltage with He stripping. Data is processed using the BATS data reduction software as described by Wacker et al. (2010). The fraction modern carbon, F14C, is calculated according to as the ratio of the sample 14C/12C to the standard 14C/12C (Ox-II) measured in the same data block. Both 14C/12C ratios are background-corrected and the result is corrected for fractionation (occurring both from spectrometer and sample preparation fractionation) using the online AMS measured 13C/12C ratio and is normalized to δ13C (PDB). Radiocarbon ages are calculated as -8033ln(F14C) and reported in 14C yr BP (BP=AD 1950), as described by Stuiver and Polach (1977). Errors on 14C ages (1σ) are based on counting statistics and 14C/12C and 13C/12C variation between data blocks. We do not report online AMS δ13C as it contains machine-induced fractionation.