PERSPECTIVES ON THE ORGANIZATION OF LITHIC TECHNOLOGY AT THE PUNCHAW LAKE SITE - FiRs-1

by

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Abstract

The Punchaw Lake village site, FiRs-1, is in the north central interior of British Columbia, a rarely researched region in terms of the archaeological record. A small area of the site was excavated in 1973; the finds of this excavation are the subject of this analysis. The lithic assemblage is classified and a technological organization approach is used with design theory to attempt to determine what activities were occurring at this site and how they fit into past lifeways. A community-based approach is attempted by bringing the finds to the Nazko First Nation, whose claimed traditional territory encompasses Punchaw Lake. Their knowledge and stories regarding these artifacts and this region are woven in to bring their voice and perspective to the interpretations. This enriched analysis determined that this village and its diverse tool assemblage could have been the centre of a complex subsistence strategy that ranged far across the landscape to best utilize the available resources.

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Acknowledgments

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CHAPTER 1 - INTRODUCTION

In 1973, Knut Fladmark and a group of students from Simon Fraser University spent the summer excavating at the Punchaw Lake site, FiRs-1. The Punchaw Lake site is approximately 60 kilometres south-southwest of the city of Prince George, located on the outlet stream of Punchaw Lake that drains into the Fraser River (see Figures 1 and 2). Their work resulted in the collection of over 6000 artifacts, the large majority of which was lithic material, along with detailed information regarding context and stratigraphy. As one of only a handful of archaeological sites to have been excavated in the central interior of British Columbia, it has been an important site for researchers; the preliminary field report (Fladmark 1976) is still routinely cited (*cf.* Magne and Matson 2008; Matson and Magne 2007; Richards and Rousseau 1987). However, no detailed analysis of this assemblage was ever completed.

Since the FiRs-1 excavations, cultural resource management projects have identified thousands of sites in the central interior, however, virtually no academic or research-based analysis has occurred. The nearest sites, geographically, with published reports and comparable collections are found at Anahim Lake (Wilmeth 1978) and Keatley Creek (Hayden 1997, 2000a, 2000b, 2004). These sites are over 200 and 300 km away respectively and are found within different cultural and biogeoclimatic regions. This represents a significant gap in our understanding of the ancient lifeways and movements of First Nations peoples in this area. The analysis of the lithic assemblage from the Punchaw Lake site is a small step towards filling that gap and laying the groundwork to address more meaningful questions regarding the pre-Contact history of the area.

A parallel concern is the need to address the concerns of the First Nations who have an inherent interest in this site and these artifacts. The descendant First Nations have long been excluded from the archaeological research of their own ancestors, to the great detriment of the discipline (Downer 1997). While it is becoming more common for First Nations to be consulted and involved to varying degrees, we are still far from consistent practices of collaboration (Nichols and Andrews 1997; Syms 1997). The majority of projects that have sought to better integrate the needs of contemporary First Nations have focused on low impact survey, participation in field work, and site selection and the training of First Nations individuals (Watkins 2003). Involvement of First Nations after the fact of excavation has tended to focus on the ownership or stewardship of cultural materials (Asch 1997; Clavir 2002; Nichols 2009) and the inclusion of oral traditions in a scientific analysis (Echo-Hawk 2000; Mason 2000; Whiteley 2001). As the focus of this project is the analysis of the cultural material that had already been excavated, the challenge was to find a natural bridge between archaeological methodology and a First Nations perspective. The work of Ferguson and Colwell-Chanthaphonh (2006) suggested a way to bring the artifacts themselves to the First Nations to invite their interpretations and oral traditions as they may relate to the material and the analysis.

This approach is hopefully a small step towards a more inclusive archaeology, although it is not true Participatory Action Research (PAR). PAR is the increasingly accepted model for community based research, wherein research questions are identified by the community, the work is carried out within the community and involves training of members and the research results in actions or publications that are for and by the people (Kindon *et al.* 2007; Robinson 1996). The PAR method is a self-determined approach from within indigenous communities, making the projects and the results much more relevant and constructive to the people at the heart of the research. This project could not meet these standards as it originated outside the community and is based on a previously established data set; a collection of artifacts that were excavated almost 40 years ago. The methods of excavation and documentation to a certain extent inform the manner in which a collection can be analysed from the perspective of Western archaeology.

However, community inclusion for the current project was sought early on and the idea of bringing artifacts to the community Elders was suggested first by Laurel Crocker, a representative of the Nazko First Nation, in an initial meeting. The Lheidli T'enneh Nation, whose asserted traditional territory also covers the Punchaw Lake area, were approached with an invitation to participate, and they respectfully declined. Doreen Patrick, a Nazko Elder and the Nazko Language Coordinator became the liaison for the project. The Nazko Nation opened the project to any Elder who wished to participate, and then additional voices were added by Doreen Patrick, to fill out the narrative. Some previously recorded interviews from an earlier project of preserving oral traditions and stories were provided by Doreen (Quesnel and District Museum and Archives 2008). Nazko Elders Lucy Laurent, Dorothy Nome and Ellie Peters, along with Doreen Patrick, chose to participate in this project when the artifact samples were brought to the Nazko office in Quesnel. As none of the women had memories specific to the Punchaw Lake village or the immediate vicinity of the lake, they suggested that J. Morris Boyd, Doreen's father, might have more specific knowledge of Punchaw Lake area. A second meeting was held in the community of Nazko on a separate occasion to share the artifacts with J. Morris Boyd, who also did not have specific memories or stories regarding the Punchaw Lake site; however, he had spent time hunting and fishing in the general area.

The community members who chose to see the artifacts and share their interpretations and stories agreed to being recorded by video camera, and this documentation will become part of the preservation of the traditions for the Nazko Nation, as will the research itself.

The goal of this research was to work with the Nazko First Nation to discover what the lithic assemblage can tell us about the types of activities which may have taken place at the Punchaw Lake site. Key issues are mobility and subsistence strategies as addressed by the study of technological organization (Odell 2003:10). Given the variety of tools and types identified within a very small area of the site, a secondary concern was an attempt to identify any variation in the distribution of artifacts between the two main excavation areas of the 1973 field school excavations.

Excavations at the site were conducted in two distinct areas, focused on specific cultural features; Area A contained House Platform 1 and portions of House Platforms 34, 36, and 43, and Storage Pit 50, while Area B contained the undisturbed portions of House Platform 2. In 1974 a third area, Area C, was opened approximately 75 meters to the north of Area B. Area C was found to contain several cultural features indicative of habitation, however discreet structures were not identified (Montgomery 1978:67). The finds from Area C have been previously examined (Montgomery 1978) and are not a significant part of the following analysis. Arbitrary levels and natural stratigraphic and cultural layers are recorded for most artifacts.

Unfortunately, while a long time span of occupation or use of the site is noted in the carbon-14 dates and is supported by the wide variety of projectile point types, the contexts were found to be too disturbed to allow for analysis of the distribution of artifact types chronologically. The primary cause of the stratigraphic disturbance is the house platforms themselves. These cultural features represent the most recent occupation of the site and they were dug into the slope to depths of up to one metre, seriously disturbing all of the older materials and their context. After the site was abandoned the up-slope materials were subject to weathering and slumping down into the platform area, depositing older materials alongside the more recent. Despite detailed locational information having been recorded during excavation, no distinct temporal horizons could be established within the stratigraphy. This is a common problem on archaeological excavations where cultural features such as house platforms or pits are concerned, as Wilmeth (1978) has noted.

The Western based theoretical approach to the lithic analysis incorporates both the culture historical and technological organization approaches (Nelson 1991). The culture history proposed by Richards and Rousseau for the Canadian Plateau (1987) is the framework currently accepted by most archaeologists for this area and is used as the primary basis for interpreting the occupation history of FiRs-1, supported by the identification of diagnostic artifacts, such as projectile points. With the study collection sorted by type, the design theory approach is used to interpret patterns relevant to technological organization, based on the method proposed by Hayden, Franco and Spafford in 1996, as they applied it to the Keatley Creek site material. This approach is rooted in the concept of organization of technology as described by Nelson (1991) as a theoretical framework that has been influential in lithic analysis research over the last thirty years. The basic precept of this scheme is that the way technology is designed and used by a group is in some way dependant on their environment and their responses to that environment, especially those peoples so closely tied to their surroundings as hunter-gatherers (Rahemtulla 2006). Working with this assumption provides a way to possibly elucidate culture and behaviour in the archaeological record.

In Hayden, Franco, and Spafford's (1996) method, ethnographic, geographic and environmental information for the specific location of the site are incorporated into constraints on tool design, such as raw material availability or intended task, that would likely influence people living in that location. This information is then applied to the various design considerations or variables of tool design. The tool assemblage is then assessed according to different production strategies and which constraints and design considerations are apparent. With this information, interpretations are made regarding the possibilities of different production, subsistence and mobility strategies evident in the assemblage (Hayden *et al* 1996).

With this part of the analysis complete, the initial results and a sample of the artifacts were taken to the Nazko First Nation, whose asserted traditional territories cover the region of the Punchaw Lake site. This sample included at least one complete example of each of the tool types identified within the collection. The community Elders who chose to participate voiced their own impressions and interpretations of the finds, and the site, and gave their own meaning to it. This approach provides a qualitative aspect to the data (Ferguson and Colwell-Chanthaphonh 2006:19). The First Nations communities are recognized as the significant knowledge holders and their voices are in equal standing on site and artifact interpretation and analysis. As Noah Cardinal, a Cree elder suggests "It's team work...This way we put a Native understanding and your understanding and we get a better story." (*cf.* Hanna 1997:75). An extensive traditional knowledge was not expected on the more technical aspects of how these tools were made, as the influence of missionaries and fur traders had largely replaced stone tools with imported metal hardware by the end of the nineteenth century (Tobey 1981). However, the impressions, stories and memories they invoke are important aspects of the meaning and interpretation of these artifacts to descendant communities and archaeologists. The philosophical or spiritual values associated with cultural materials are as important as the interpretation of function and are given equal weight and standing as Western archaeological interpretation (Forsman 1997).

This research is an attempt at a more holistic and integrated analysis of a lithic assemblage. Following this introduction is a detailed description of relevant background information regarding the environment, ethnography and archaeology of the northern central interior in Chapter Two. Stories from the Nazko Elders enhance and inform some of this ethnographic information. Chapter Three presents the Western concept of technological organization and the formulation of expected influences on tool design at the Punchaw Lake site. Chapter Four presents the lithic analysis, with a classification of tools, and a discussion. Where specific tool types elicited a response from First Nations participants, these are included in the type description and this information is also incorporated into the analysis. Conclusions regarding the significance and interpretation of the lithic assemblage of Punchaw Lake are presented in Chapter Five.

CHAPTER 2 – BACKGROUND

The Punchaw Lake site, FiRs-1, is located in the north central interior of British Columbia, on the shores of a small lake, approximately fifteen kilometres west of the Fraser River, 60 kilometres south-southwest of the city of Prince George (Figures 1 and 2). The site has long been considered historically significant as it has been associated with Alexander Mackenzie's famous journey across the west in search of a land trade route to the Pacific Ocean. Mackenzie, in 1793, describes encountering the First Nations people in the area of the Blackwater River, which he called the West Road River. They told him of a land route that they used to trade with the Nuxalk people (formerly known as the Bella Coola). His first night on that trail was spent in an "Indian camp of three fires" on a lake about 13 kilometres west of the Fraser River (Mackenzie 1970:340). The lake described is not clearly identified as Punchaw and Fladmark (1976:19) does not consider the village site to be the same place as this encampment. However, the potential association has garnered attention. The route may have passed through the site area, as the modern re-established Alexander Mackenzie Heritage Trail/Nuxalk-Carrier Grease Trail does, serving to increase the romance of the connection. This trail was a major trade route long before Mackenzie passed through, and was likely the primary route for trading eulachon grease from the coast to this part of the Interior.

A second reason for interest in the Punchaw Lake village site is its remarkable status as one of the very few sites excavated for research purposes within the north central interior. The site represents occupation through the Late Pre-Contact Period of approximately 3500 BP to the contact era (Fladmark 1982). Table 1 details the eight radiocarbon dates that have been derived from bone and charcoal samples, suggesting at least three periods of occupation. The earliest date is 3980 ± 100 BP (GaK-4907),

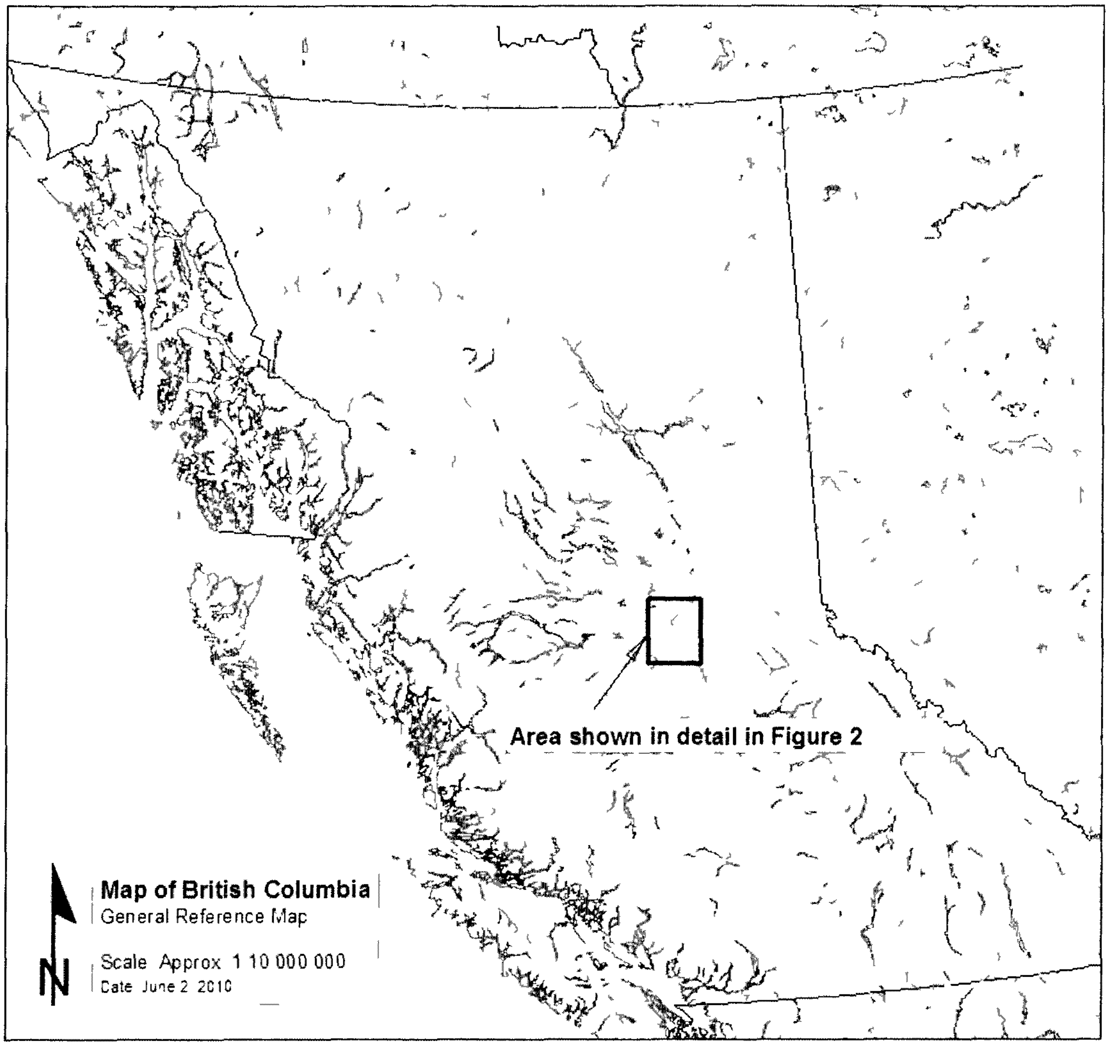

Figure 1: General reference map - Indicating area of study

followed by 1510 ± 100 (GaK-6230) and 1470 ± 100 (GaK-6231), 560 ± 75 BP (GaK-4905) and four dates falling between 290 ± 70 (GaK-4906) and 240 ± 70 BP (GaK-4909) (Fladmark 1976:31). The presence of moose (*Alces alces*) remains suggests an even

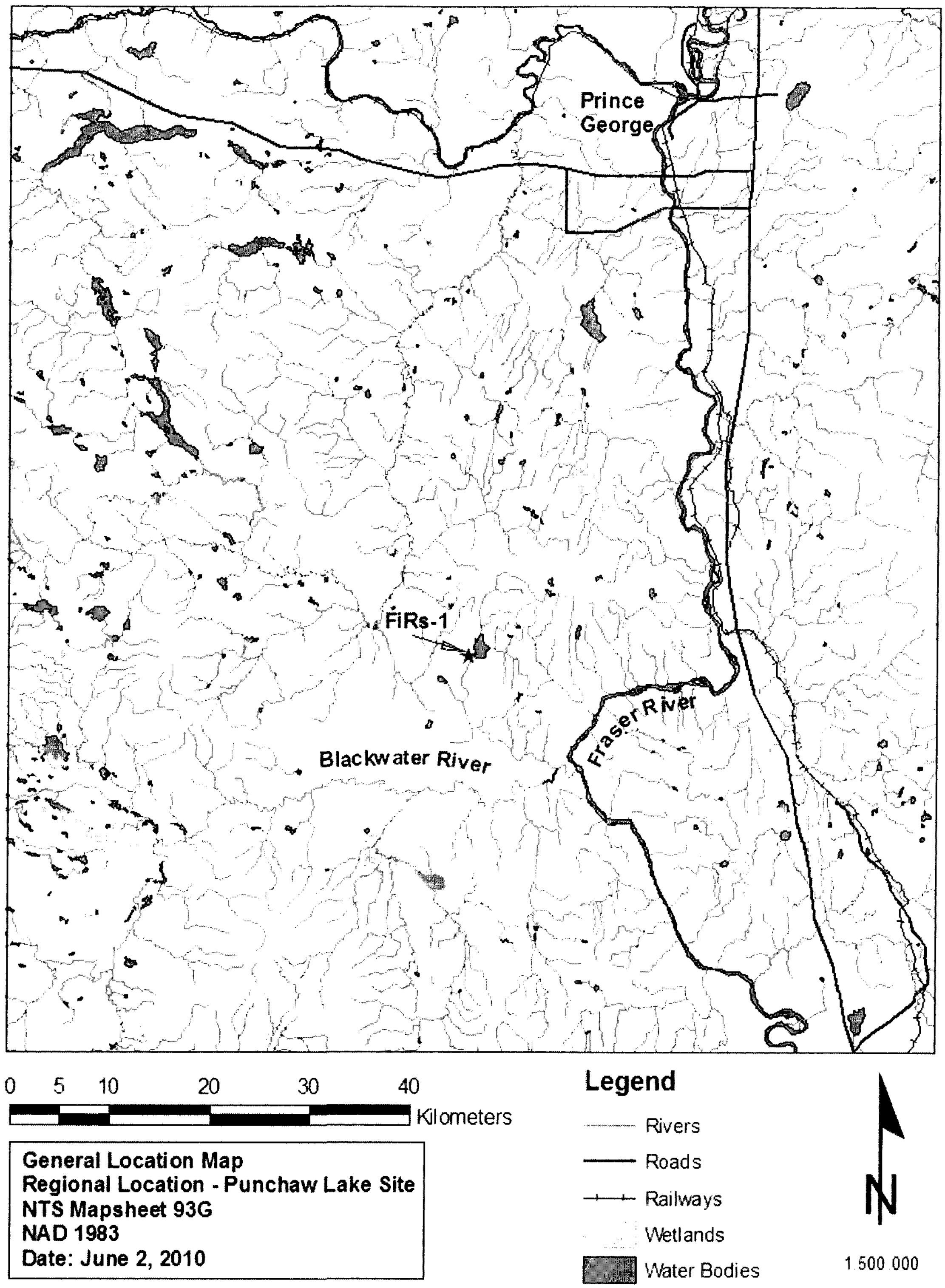

Figure 2: General location map - indicating position of Punchaw Lake site, FiRs-1, within the central interior of British Columbia

more recent occupation than the radiocarbon dates, as moose were not found in the central interior until the late 1800s. This broad date range suggests a long history of use or re-use over a period of cultural change in the interior of British Columbia, in an area where the archaeological record is still very poorly understood.

Normalized Age	Lab No.	Material Dated	Provenience
3980 ± 100	GaK-4907	Carbonized organic matter	Near burial, HP 1
1510 ± 100	GaK-6230	Charcoal	
1470 ± 100	GaK-6231	Charcoal	
560 ± 75	GaK-4905	Charcoal	HP 1, upper zone
290 ± 70	GaK-4906	Charcoal	CP 50
250 ± 70	GaK-4908	Charcoal	HP 2, just below ground
240 ± 150	GaK-6232	Charcoal	
240 ± 70	GaK-4909	Charcoal	HP 43 floor

Table 1: Radiocarbon dates from the Punchaw Lake site, FiRs-1

FiRs-1 covers an area of approximately 5.4 hectares on a gently sloped river terrace, over Tako Creek (Figure 3 and 5). The site was originally documented in 1965 by a local surveyor (Fladmark 1976:21). Knut Fladmark and his team from Simon Fraser University mapped the site as part of their 1973 field program and identified 43 house platforms and 57 cache pits. The house platforms are level areas, four by six meters on average, cut into the slope, while the cache pits are less than 2 meters in diameter and are roughly circular. Two areas were selected for the excavation, A and B. Area A involved the complete excavation of House 1, the largest house platform, located in the south end of the site, near the terrace edge (Figure 4). Also in Area A were small portions of Houses 34 and 36, which were subject to test excavations. Only one feature, House 2, was located in Area B and it was completely excavated. House 2 had been partially disturbed by development of a skid trail for near-by logging activities and was located in the centre of the site, also near the terrace edge. House 43 was located towards the north end of the site, near the terrace edge that defines the eastern boundary of the site, and it was also subject to a test unit excavation. The 1974 Area C excavations focused on an apparent cluster of four house platforms (Features 13, 14, 15, and 16 on map in Figure 3, between E30-E60 and N150-N180 grid points). While several cultural features were found that indicate habitation in the area, including two hearths, distinct evidence of specific structures could not be identified (Montgomery 1978).

According to the field notes, excavation methods involved digging by trowel and brush to uncover artifacts as small as 1 cm in maximum dimension. This method was designed to allow for detailed *in situ* recording in three dimensions and preliminary cataloguing of all finds. Screens of ¼" mesh were used to sort the matrix for smaller artifacts. Excavation went down to sterile soils, which were approximately 40 cm deep at the east, shallow ends of the house platforms and up to 1 m at the west side of the houses, further up the slope. Cultural strata were identified and probable floor layers were determined, however the strata were disturbed and difficult to interpret due to tree and root disturbances and due to the mixing of cultural layers as later house building activities impacted on older deposits. At the bottom of the excavations post moulds were identified that defined the house walls and showed different periods of construction. Central hearths were also noted within the houses (Fladmark 1996).

In total 130 square meters were excavated during the 1973 field school excavations, which only represents 0.24% of the total site area; a very small sample. Over 6200 artifacts were recorded *in situ*, and additional smaller finds were also collected. The 1974 Area C project excavated 35 square meters and collected almost 7000 stone artifacts (Montgomery 1978). The analysis of the Area C material was

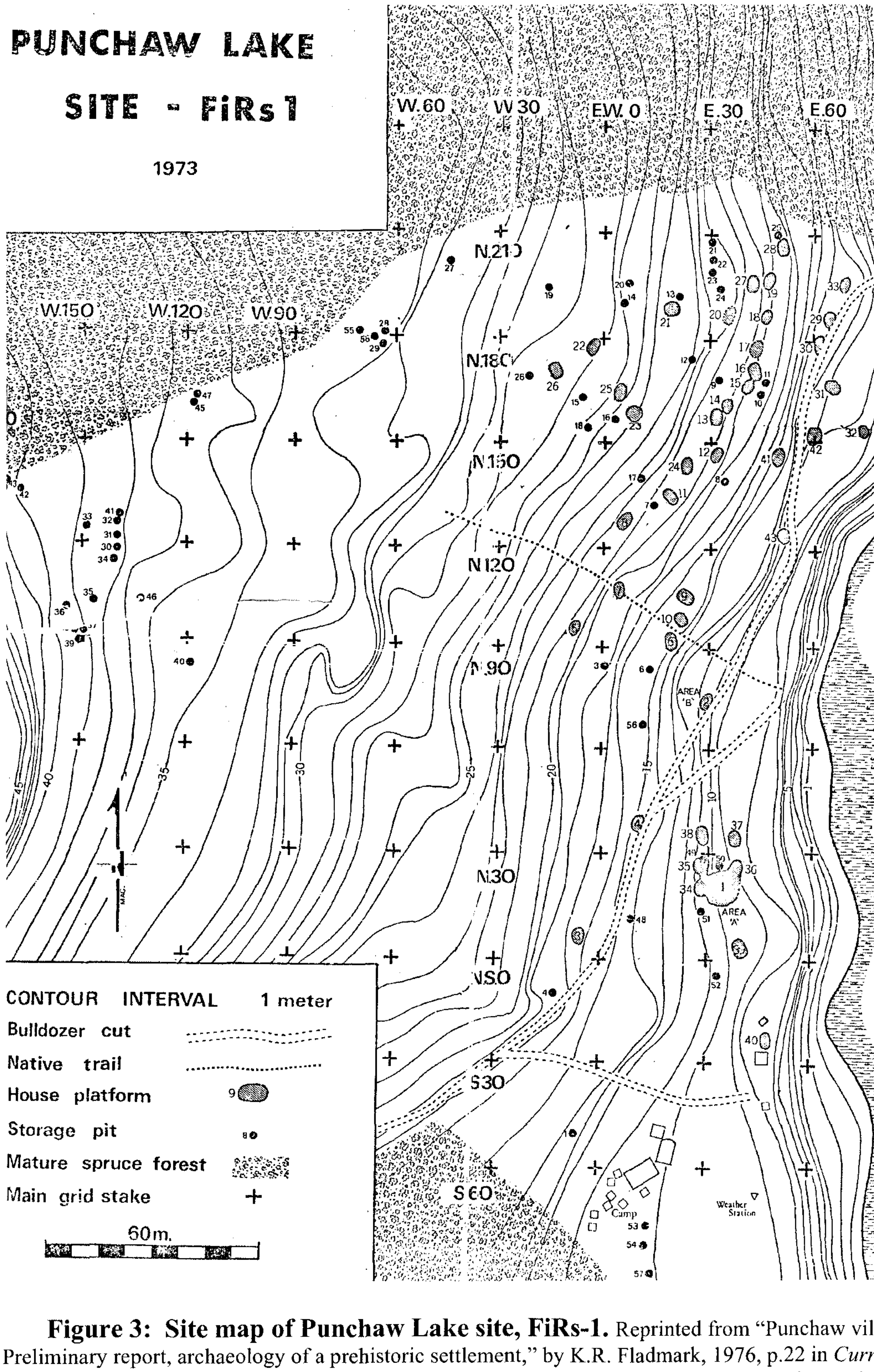

Figure 3: Site map of Punchaw Lake site, FiRs-1. Reprinted from "Punchaw village: A Preliminary report, archaeology of a prehistoric settlement," by K.R. Fladmark, 1976, p.22 in *Current Research Reports,* edited by Roy L. Carlson. Copyright 1976 by the Department of Archaeology, Simon Fraser University. Reprinted with permission.

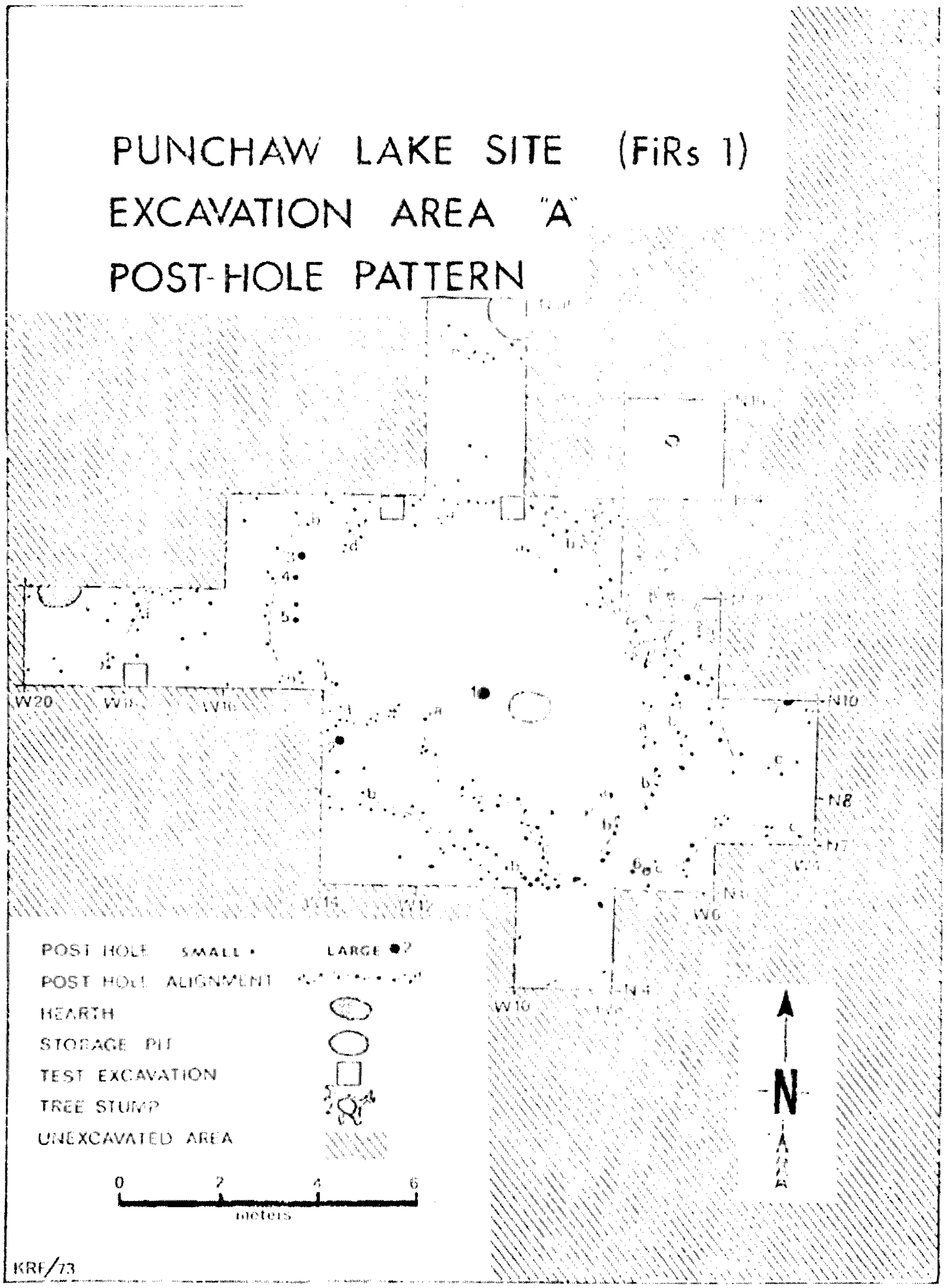

Figure 4: Detail of completion of excavation Area A, FiRs-1 Reprinted from "Punchaw village: A Preliminary report, archaeology of a prehistoric settlement," by K.R. Fladmark, 1976, p.27 in *Current Research Reports,* edited by Roy L. Carlson. Copyright 1976 by the Department of Archaeology, Simon Fraser University. Reprinted with permission.

completed and can be found in Montgomery's M.A. thesis (1978). Such numbers of finds collected from such a proportionately small area of the site attests to its richness. To put this into the context of the central interior of British Columbia the remainder of this chapter will describe the environmental and cultural background relevant to discussion of the Punchaw Lake site. The chapter is divided into three main sections; physical setting, which provides both past and present geographical context; Dakelh ethnography, combining both ethnographic and historic evidence; and archaeological background, highlighting both proposed cultural historic sequences and relevant comparative sites.

Physical Setting

The Punchaw Lake site is located in the central interior of British Columbia, in an area known as the Interior Plateau. The Interior Plateau is bounded by the Rocky Mountains, the Coast Mountains, the Omineca Mountains and the Columbia Mountains. A number of large lakes, such as Babine, Stuart, Takla and Francois, were carved out by repeated glaciations and are significant features of the north and west areas of the Plateau (Figure 1). Located less than 15 km from the Fraser River, between Prince George and Quesnel, the site is near the centre of the Fraser Basin (Holland 1976; Tipper 1971). Terrain in this region is characterized by rolling till plains and drumlins, as well as occurrences of esker complexes and large areas of glaciolacustrine silts and clays caused by pro-glacial lakes formed during the retreat of the Cordilleran ice-sheet of the last glaciation (Bovis 1987:476). Numerous small lakes, wetlands and minor drainages are scattered across this landscape.

The Fraser Basin is within the Sub-Boreal Spruce (SBS) zone, with weather generally moister and cooler than areas to the west and south. Precipitation is consistent throughout the seasons, with snowy winters subject to blasts of Arctic air and warm, damp, and short summers. The Blackwater River watershed is primarily within the SBS moist cool subzone (Meidinger, *et al* 1991). The forests consist mainly of mixed spruce (*Picea*) species, lodgepole pine (*Pinus contorta*) and subalpine fir (*Arbies lasiocarpa*). Secondary species include douglas fir (*Pseudotsuga menziesii*), trembling aspen (*Populus tremuloides*), cottonwood (*Populus balsamifera*), and birch (*Betula papyrifera*) (MacKinnon *et al* 1999:4). The understory vegetation varies greatly depending on micro-climate, overstory and soil conditions.

To complete the description of the setting of the Punchaw Lake site, the village is located at the south west corner of Punchaw Lake, on the north bank of the outlet stream, Tako Creek (Figures 3 and 5). Tako Creek flows west and south into the Blackwater River, which flows east into the Fraser River. The terrain is gently to moderately sloped (note 1 metre contour intervals on the site map in Figure 3), with a southeast aspect and a defined break in slope defining the terrace edge over-looking the creek. The overstory consists of an aspen and cottonwood grove, surrounded by mixed spruce, pine and fir trees. The understory consists primarily of dense shrubbery due to the open canopy. The aspen and cottonwood are common in disturbed locations and while there are some logged areas near, and a logging skid trail through the site, the site itself was likely not logged over. Fladmark (1976) conducted an arboreal survey and coring exercise during the field season and concluded that this overstory may be the result of historic era inhabitants clearing the coniferous forest to build their structures. The surrounding forest of mature spruce, pine, and fir has not been subject to historic era clearing and is indicative of typical mature forests in this region, though it is not necessarily indicative of the vegetation during the earlier occupations of the site. Soils in the immediate vicinity of the site are mixed due to this glacial history. To the south of the site are glaciolacustrine silty clays, while to the north is a rolling morainal till plain dominated by sandy clays and loams with till and gravel inclusions (Canada Soil Inventory 1989). Fladmark (1976:26) documents both silts and sands with gravels with lower clay layers at the site.

Climate has not remained constant throughout the Holocene. There is evidence suggesting that significant fluctuations have occurred, but little consensus on exactly when or to what extent. British Columbia likely went through a warming trend known as the Hypsithermal peaked between 7000 to 6000 years ago. The subsequent cooling period became evident between 5000 to 4000 years ago (Hebda 1995). Lake bottom sediments contain pollen that indicate the southern interior grasslands extended much further north during the Hypsithermal, pushing the transitional douglas fir/ponderosa pine forest and boreal forest further north as well. The subsequent cooling trend brought an expansion of the boreal and sub boreal forests back into the north central interior around 4000 years ago (Hebda 1982). These fluctuations would have directly impacted the Punchaw Lake area as it is located in a transitional zone between the drier Chilcotin Plateau and the Sub-Boreal forest.

Currently fauna in the Sub-Boreal Spruce zone consists primarily of a few large game animals, many fur-bearers and some smaller rodents. Moose (*Alces alces*) and deer (*Odocoileus virginianus* and *hemionus*) are the more common large ungulates today. Moose were not known west of the Rocky Mountains prior to the late 1800s and are a successful invasive species, competing with caribou (*Rangifer tarandus*) and elk (*Cervus* *canadensis*) (Hudson 1983:65). Important fur-bearing species include beaver (*Castor canadensis*), fisher (*Martes pennanti*), ermine (*Mustela erminea*), mink (*Mustela vison*), marten (*Martes americana*), and snowshoe hare (*Lepus americanus*). The grey wolf (*Canis lupus*), fox (*Vulpes fulva)*, lynx (*Lynx rufus* and *L. canadensis*), coyote (*Canis latrans*), black bear (*Ursus americanus*) and grizzly bear (*Ursus arctos*) are the predatory species, and are also common fur-bearers. Other species include porcupine (*Erethizon dorsatum*), squirrel (*Tamiasciurus hudsonicus*), mice (*Peromycus maniculatus* and *Zapus sp.*) and woodchuck (*Marmota monax*). A wide variety of birds are known in the area as well, including several duck species (*Anatidae*), raptors (*Accipitridae* and *Falconidae*) , owls (*Strigidae*), several grouse species (*Phasianidae*), song-birds and warblers and the migratory sandhill crane (*Grus canadensis*) (Meidinger *et al* 1991). The fish of the Fraser Basin and of British Columbia in general, have received the most attention ethnographically, as the main food source of the indigenous peoples. Salmon (*Oncorhynchus* sp.) dominate discussions on subsistence (*cf.* Kuijt 1989; Kusmer 2000; Barry 2000), and the influence of the salmon runs on the indigenous lifestyle cannot be denied. However, the numerous species of freshwater fish, including Dolly Varden (*Salvelinus malma*), lake and rainbow trout (*Salvelinus namaycush* and *Oncorrhynchus mykiss*), burbot (*Lota lota*), whitefish (*Coregonus clupeaformis*), suckers (*Catosomidea*) and the white sturgeon (*Acipenser transmontanus*), were also very important, filling out the diet when the salmon runs were unreliable (Aasen 1987).

A preliminary zoological analysis of the faunal remains at the Punchaw Lake site was completed by the author during the course of this research and a list of the species identified within the assemblage can be seen in Table 2. This analysis was cautiously designed to identify any patterns with regards to the diet of the village's inhabitants or

Mammals	
Castor canadensis	Beaver
Ursus americanus	Black bear
Rangifer tarandus	Caribou
Alces alces	Moose
Lynx canadensis	Lynx
Lepus americanus	Snowshoe hare
Odocoileus hemionus	Mule deer
Ursus arctos	Grizzly bear
Ondatra zibethicus	Muskrat
Canis sp.	Wolf or large domestic dog
Lutra canadensis	River otter
Mustela sp.	Weasels or mink
Procyon lotor	Raccoon
Tamiasciurus hudsonicus	Red squirrel
Birds	
Bucephela albeola	Bufflehead
Podiceps grisegena	Red-necked grebe
Podilymbus podiceps	Pie-billed grebe
Anas acuta	Pintail
Canachites canadensis	Spruce grouse
Mergus sp.	Mergansers
Bonasa umbellus	Ruffed grouse
Lophortyx californicus	California quail
Fishes	
Salmo sp.	Trout

Table 2: Species identified in the FiRs-1 faunal assemblage

seasonality of habitation in the village, taking into consideration the small size of the sample. The comparative collection at the Simon Fraser University Archaeology Lab was used to identify the species and elements of all faunal remains that were sufficiently complete. Analysis then involved using basic statistical methods, such as NISP and MNI, to assess relative abundance of taxa and conduct intrasite comparison (Table 3).

Unfortunately, no solid conclusions could be drawn regarding the seasonality of the site. The assemblage is dominated by fur-bearing animals such as beaver, lynx and muskrat and large game such as bear and caribou, which could suggest winter hunting activities. There are several migratory bird species evident that would only have been

Taxa	H01	H02	H34	H36	H43	S50	?
Mammals							
Castor canadensis	50	42	8	2	3		3
Ursus americanus	23	9	5	1			
Rangifer tarandus	11						
Alces alces	5					1	1
Lynx canadensis	4	8	3				1
Lepus americanus	4						
Odocoileus hemionus	4						2
Ursus arctos	4						
Artiodactyl sp.	3						
Ondatra zibethicus	2	5	3				1
Canis sp.		2					
Lutra canadensis	1						
Mustela sp.	1						
Procyon lotor	1						
Tamiasciurus hudsonicus	1						
Birds							
Bucephela albeola	4		1				
Podiceps grisegena	3						
Podilymbus podiceps	2						
Anas acuta	1						
Canachites canadensis	1		1				
Mergus sp.	1						
Bonasa umbellus			1				1
Grouse sp.		1	1				
Lophortyx californicus			1				
Total	**126**	**67**	**24**	**3**	**3**	**1**	**9**

Table 3: NISP by feature, FiRs-1

available during the summer season. Very few fish remains were identified, and most of the fish remains that were collected could not be positively identified as to species. This result may indicate the initial fish processing was occurring away from the site, possibly closer to the Fraser and the Blackwater, or that fish was not a significant food source at this location. Additionally, due to normal taphonomic processes, fish remains have a poor rate of survival (Reitz and Wing 1999:110-141). Given the very small percentage of the site excavation, this may also be a sampling issue.

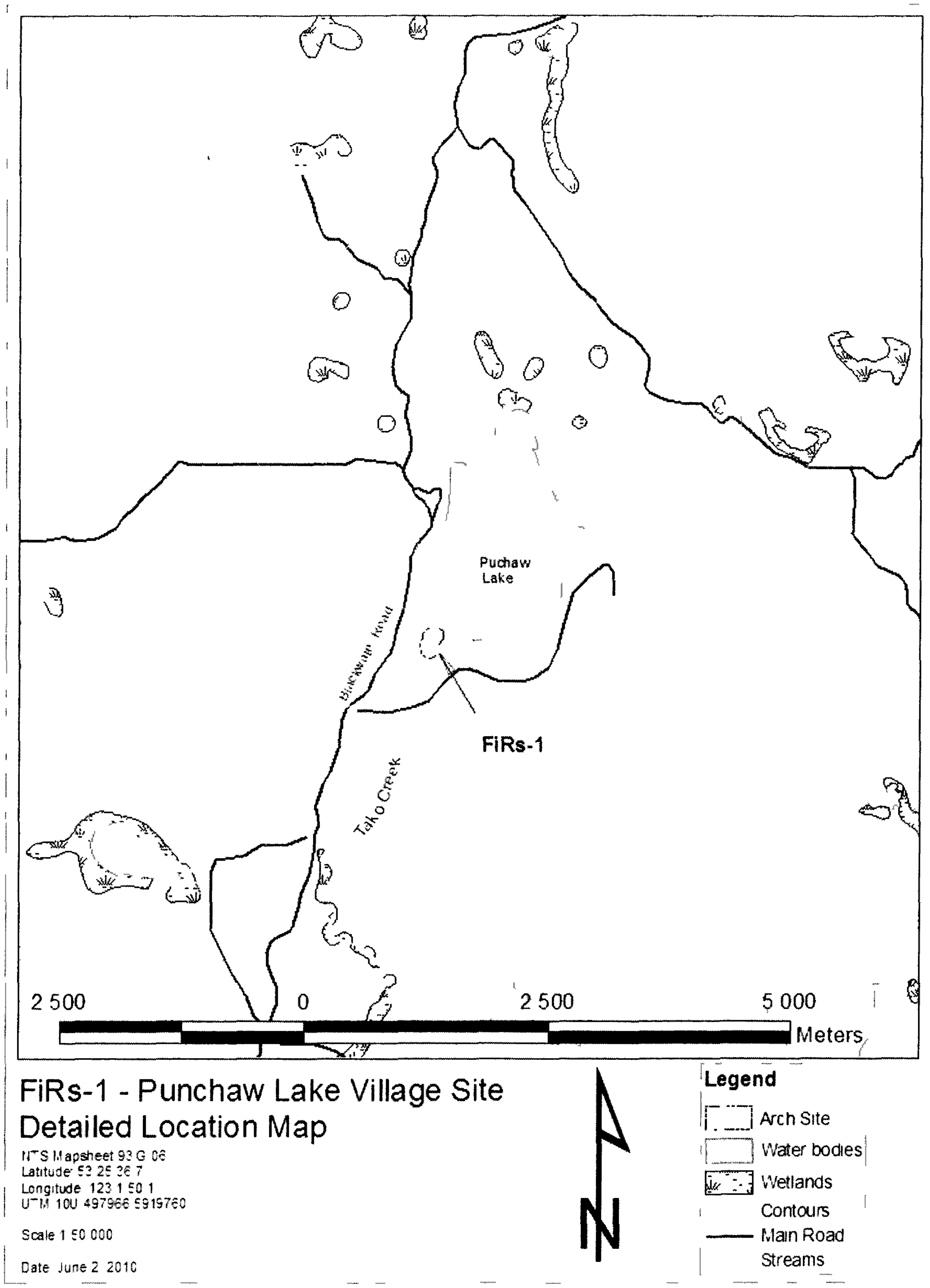

Figure 5: Punchaw Lake village site, FiRs-1 - Detailed location map

Dakelh Ethnography

The peoples encountered by Mackenzie near the mouth of the Blackwater River are an Athapaskan group, ethnographically known as the Carrier, now known as the Dakelh. This region is near the southern extent of the territories occupied by Dakelh groups. The Dakelh consist of several groups or bands in the central interior of British Columbia who speak very closely related languages, and are part of the larger Athapaskan language family which covers a large area to the north and east. There are several groups within the Dakelh, the most comprehensive listing of the main Nations with the various names and spellings is outlined in Tobey (1981) based on a thorough review of the literature. The Punchaw Lake site is within the traditional territory of two of these groups; the Nazko First Nation and the Lheidli T'enneh Nation[1]. The ethnographic record and the oral traditions of these Nations indicate key features of their culture that have archaeological significance, such the seasonal round, dwelling types and site locations, resource use and material culture, as will be detailed below.

The Seasonal Round

The seasonal round of the Dakelh people is the central organizing feature of both group structure and subsistence practices. The round is a response to environmental pressures and the need for the most efficient use of the available resources. This is important in understanding site distribution, site types, subsistence, trade relations, and other social issues. A general pattern can be outlined for all Dakelh groups; however different areas have had variations on the pattern, primarily due to localized variations in

[1]Spelling of band names used here are those currently preferred by the First Nations themselves. Each group has been referred to in the past by different names, variations and spellings.

climate and resources as well as cultural influences from neighbouring groups. The following has been compiled from several sources including Dawson (1881), Furniss (1995), Goldman (1940), Hall (1992), Harmon (1911), Mackenzie (1970), Moran (1988), Morice (1893, 1910), Prince (1984) and Tobey (1985).

The summer salmon runs were the anchor of the subsistence strategy. According to all sources, in July or early August, the families of the group would gather together in their villages on the lakes or salmon rivers to net as much of the run as possible. The run and the subsequent cleaning, drying and storing of the fish would continue until late September or October. In the late fall the group would disperse into family units going out to their traditional hunting and trapping grounds, known as a *keyoh*, and setting up seasonal camps on the small lakes. Some Dakelh groups would also return to the village late in the winter, when the trapping and hunting became too difficult, to live off the salmon stored there in the fall (Tobey 1985:425; Furniss 1995:523). In the late winter or early spring the group would splinter again and go out to their familial grounds to trap and to ice fish, staying out until it was time to gather and prepare for the summer salmon run. Also during this season the Dakelh were known to strip the bark off of young lodgepole pine trees to eat the cambium layer (Marshall 2002). Cambium was eaten fresh and could also be dried or pounded into a paste for mixing with berries and cooking (Turner 1997). Contact era cambium-stripping sites are commonly found throughout Dakelh territories and elsewhere in the interior.

The fur-trade disrupted this routine early in the Contact Period for some groups. Goldman (1940:351) and Furniss (1995:520-523) have observed that the developing need to trade and to trap fur-bearing animals in the right season resulted in families visiting trade centers through the late spring, rather than hunting and preparing for the coming salmon run. The fur trade became an important part of resource acquisition First Nations, allowing the purchasing of some food products in addition to traditional food sources.

Despite the fur-trade, several aspects of the seasonal round continued well into the 1900s, as remembered by the Elders of the Nazko First Nation. Herbert Hance recalls travelling to Anahim Flats to camp near the sockeye fishing grounds for the spawning, then going out to hunt moose during the fall rut. Moose were plentiful at the time and could be found everywhere (Quesnel and District Museum and Archives 2008). Peter Louis recalls how "they worked from spring to fall and then from fall to winter…every season they got something to do" (Quesnel and District Museum and Archives 2008). His family camped at Nazko to fish and then headed to Itcha Mountain to hunt caribou and on to Kluskus to collect berries, and then back to Nazko. In the summer they travelled to Barkerville to collect berries and then back to the Fraser River for the salmon run, after which they returned to the Nazko village. According to J. Morris Boyd, the caribou hunt at Itcha Mountain was a group experience, occurring in early spring while snow was still deep on the mountains. A group would chase and trap the animals in deep snow drifts, possibly tree wells, and then they could approach them and cut their necks. Meat and hides were processed and dried on site and then the hides were used to drag the dried meat down the mountain for storage in cache pits, or back to the village (personal communication, December 11, 2010).

While estimates vary, the salmon caught in the late summer runs accounted for approximately 50% of the Dakelh diet. Hunting large game, while key in the winter season, was of less overall importance than fishing and trapping in the proto-contact era (Steward 1960:733). The extensive Dakelh vocabulary and detailed social laws and etiquette regarding the practice of hunting and respect for the animals suggest that hunting was of much greater significance in the distant past (Morice 1910:165-183). There are highly developed ritualistic and symbolic practices attached to the act of hunting, while by stark contrast, there is almost no mythology or distinct mores tied to salmon or the act of fishing.

Settlement and Habitation

The seasonal round is important to understanding settlement patterns of the Dakelh people, which consist of both semi-permanent villages and seasonal camps. A.G. Morice recorded many details on Dakelh structures (1893) and occasional comments by the early explorers and fur-traders provide additional information towards understanding the places and ways in which the Dakelh made their homes.

Summer villages were located in places where salmon fishing would be most successful. At the confluences of rivers, at constrictions in the rivers that would make good locations for fish weirs or on lakes near inlet or outlet streams would all be choice village locations (MacLean 1932:146). The north shore, facing the sun, was preferred in order to gain as much heat and light as possible from the southern aspect (Morice 1893:181). These villages, on average, consisted of five or six houses, with multiple families or extended families living in each (MacLean 1932:146). When the family groups went out to their trap lines and hunting grounds in the winter, they would choose a new location every season, with the availability of fire-wood being a primary consideration (Morice 1910:145). Water ways, being important for navigation and the focus of the trap line, were also a prime consideration in selecting a lodge location, again with the north shore of lakes and rivers being prefered (Hall 1992:37).

The houses of the summer villages have been referred to as huts or lodges. A large post and beam ceremonial lodge was the centre of the community and would be the home of a highly ranked family. Walls were covered with vertical spruce planks; roofs consisted of rafters covered with spruce bark and an outer layer of rafters. The floor was covered with spruce boughs, except in the areas of high traffic, which were left bare. Two doors allowed for ventilation, as there were no windows. The village was filled out with smaller versions of the lodge, one for each family group. The Dakelh people were known to dig into a hillside if necessary to create flat house platforms upon which to build these cabins. Smaller, more minimal, versions of the standard hut were built as curing and storage houses for the fish (Morice 1893:184-189). Mackenzie, who passed through the Dakelh territories in the month of July, describes a very similar structure (1970:309). Above ground storage caches were also employed in the villages.

The winter houses were of two main types, depending on geographic location and the influences of neighbouring Nations. The winter lodges of the northern Dakelh were temporary structures, only occupied for one season, carefully built to withstand the harsh northern winter. They were of a rectangular plan with an A-frame superstructure, with split posts laid from ground to peak, forming the sides. The gable ends were covered with posts and spruce boughs were used to chink in the spaces. A large spruce plank formed a door to cover the single entryway, which was further protected by a semi-circular vestibule (Morice 1893:189-190). Again, Mackenzie's journals support Morice's manuscript, as he describes passing a winter hut on Cleswuncut Lake having long angled walls off a single ridge pole, covered with "Canadian Balsam" branches (Mackenzie 1970:342).

The second style of winter house is known as the pit-house or semi-subterranean hut. The pit for the house was on average two to three feet deep and approximately 20 feet in diameter. Posts were planted outside the pit on the ground surface, supported by posts inside the pit, and angled to meet at a square frame at the apex. This was both the door and the smoke hole. The whole structure was covered with wood posts or shingles and the covered over with earth (Morice 1893:191-192). The result was a house that efficiently retained heat and utilized space. The exact geographic distribution of this style is a matter of some debate. On the interior plateau the pit-house seems to appear earlier amongst groups to the south, and may be introduced by groups of the American Plateau (Alexander 2000:34). Mackenzie writes that the Dakelh referred to the Shuswap as those "who lived in large semi-subterranean recesses" (1970:314), while explorer George Dawson remarks that all the Dakelh he encountered lived in semi-subterranean huts in the winter months (1881:263). Morice notes that all groups in his classification of Lower (southern) Dakelh use this type of hut. Daniel Harmon, who ran Fort St. James in the early 1800s, describes the semi-subterranean house at the winter habitation of the Stuart Lake bands. By the 1880s the only Dakelh groups not recorded using the pit style house were the Wetsuwet'en and the Ts'il Kaz Koh (Babine), north-westerly bands more likely influenced by the plank houses of the coast (Tobey 1981).

Material culture

Much of what is known about the Dakelh's material culture was gathered by A.G. Morice. Most of his work *Notes Archaeological, Industrial and Sociological on the Western Denes; With an Ethnographic Sketch of the Same* (1893) is dedicated to listing and describing the technologies of the Dakelh, Sekani and Tsilqot'in, all of which are Athapaskan groups. Morice groups items based on raw material; stone, bone and horn, wood and other organics are the main categories. The following is condensed from his work and greater detail can be found in that publication.

Plant materials were used for basketry, clothing, wooden tools, canoes and paddles, boxes and carving. Bone and horn items include harpoon heads, and various scraper types. Most distinctive of the Dakelh in this category is the bark peeler and cambium scrapers made of caribou antler. Bone was also used for combs, gaming disks, fish hooks, arrowheads and net toggles.

Hafted ground stone tools include celts, axes, and adzes, most commonly made from basaltic materials, with higher status items made of nephrite. War clubs, hand mauls, wedges, pestles, and arrow straighteners were also made from pecked and ground basaltic cobbles. Chipped stone tools were also most commonly made from fine-grained basaltic materials such as dacite and occasionally from chert. Obsidian was rare, and according to Morice was used only for the smallest of arrowheads (1893:53). Other chipped stone tools include spear heads, knives, scrapers, and 'bayonets' used on the bow (1893:60). Lithic material was found in cobbles or quarried where possible (1893:65). Ethnographic and historic sources do not mention trading for raw lithic material (Hudson 1983).

Copper and iron appear to have been known to the Dakelh prior to direct contact with Western explorers and traders. The iron most likely came from "European" sources, making its way inland by coastal trade. Copper on the other hand was mined by some native groups before the contact era. The Dakelh traded for it and worked it into such items as rings, harpoon tips, bracelets, and tweezers (Morice 1893:137).

Archaeological Background

Culture History

In 1969 Sanger published his work at the Lochnore-Nesikep sites, on the Fraser River, between Lillooet and Lytton. He synthesized the finds at several sites to develop a sequence of cultural phases for the interior of British Columbia. He proposed a simple two part chronology. The Lochnore complex, dated to 9000-7000 BP, represented initial migrations north into the area and is characterized by leaf-shaped bifaces, large blades and cobble tools. The following Nesikep phase represents cultural continuity from 7000 BP to the proto-contact period. This period sees the development of the Interior Salish, with microblades and a projectile point sequence, a preference for basaltic materials such as dacite for chipped stone tools, and the ca. 3500 BP development of pithouses (Sanger 1969).

In 1977 Helmer proposed a four part sequence for the northern interior. He was dealing with a limited collection of sites, and he was concerned with the Athapaskan migration, this chronology only covers 5000-150 BP. The Early Pre-Contact Period, from 5000-2000 BP, identified by diagnostic 'fish-tailed points'; the Middle Pre-Contact Period dates from 2000-700 BP with a variety of corner-notched points; the Late Pre-Contact from 700-300 BP has smaller notched points and stemmed points; and the Historic Period from 300-150 BP is noted for Euro-Canadian trade items (Helmer 1977:95).

Fladmark's 1982 chronology is a synthesis of the materials in British Columbia found up to that time, including Sanger's work. Broad-based and coherent, it is the basis on which most subsequent work has been completed. The Early Period lasts from the post-glacial up to 8000 BP. This period is obscure in the interior, marked only by isolated finds of formal bifaces, mostly found in private collections or other undated contexts. The Middle Period dates from 8000-3000/3500 BP. This period is characterized by large, leaf-shaped bifaces associated with a complex of flake tools and microblades, developing into medium corner- and side-notched points, stemmed points, with microblades phasing out from 4000-1600 BP. Fladmark's Late Period, 3000/3500 BP to the Historic Period, is based on an absence of microblades, smaller projectile points suggesting arrowheads, an increased use of ground stone technology and working bone and antler, an increased use of expedient flake tools, and pithouses. Fladmark put 3000/3500 BP as the transitional stage dates between the Middle and Late Periods, though his ensuing discussions note a major change in the interior beginning around 4000 BP with earliest examples of pithouses, a noticeable increase in cultural complexity and trade, climate change, and increased salmon dependency (Fladmark 1982:135)[2].

For these same reasons, Richards and Rousseau (1987) began with this 4000 BP date as the commencement of their Late Pre-Contact Period, which they call the Plateau Pithouse Tradition and subdivide into three phases. In general this is a period of semi-sedentary hunter-gatherers, with an increasing dependency on salmon, and the adoption of pithouse technology. This work defined the Canadian Plateau as starting from the American border to an area just north of the Fraser River's northernmost point as its

[2] Fladmark notes that the Punchaw Lake site has one of the earliest house-pit features, dated to ca 4000 BP, while his preliminary report refers only to house platforms of a style ethnographically assigned to the Dakelh (1976 21)

region of study, with the Punchaw Lake material cited in each Horizon[3]. The 4000-2400 BP Shuswap Horizon includes large house-pits containing internal features, highly variable projectile point styles, key-shaped uniface/biface tools, and occasional microblades. The Plateau Horizon (2400-1200 BP) consists of smaller house pits, end scrapers, more key-shaped unifaces, an increased use of groundstone and bone tool technology, and mid-sized barbed and corner-notched points begin to dominate the variety of styles. Occasional microblades persist. The Kamloops Horizon runs from 1200 to 200 BP or the early historic period. This time period saw continuity in the development of the chipped stone tool industry, and an increase in variety of house pit sizes, in groundstone, bone and antler tools, carving and other decorative techniques, bark and wood artifacts, and no microblades. Other than pushing back the initial date of the Late Pre-Contact Period, this work largely builds on Fladmark's framework.

Stryd and Rousseau (1996), whose work concentrates more on the southern interior, interpret the beginning of the Late Period as a Salish intrusion into the interior, up the Fraser River, occurring between 4500-3500 BP. This period of relatively sudden cultural change in the interior of British Columbia has garnered attention. Possible explanations include migrations or changing climate (Richards and Rousseau 1987:22; Kuijt 1989). Strong evidence has been accumulated in the geomorphologic sciences to suggest that significant climate change was occurring at that time. The previously warm Hypsithermal period was waning and the increasingly cooler temperatures were causing far-reaching changes to ecozones (Mathewes and King 1989). Salmon began to run in increasing numbers up the Fraser River and to its tributaries, while the large game easily

[3] This arbitrary delineation cuts though the territories of the Dakelh groups, and geographically ignores important watersheds that drain into the Fraser, such as the Nechako However, given the small number of excavated sites in the ignored area, it likely makes little impact on the results of this study

hunted in the dry grasslands was displaced by the advancing forest. These fundamental changes to resource availability would have had an impact on cultural development (Kuijt 1989).

Archaeology in the Northern Interior

Ethnographic evidence and cultural comparison are relevant to the Punchaw Lake site, particularly considering Fladmark's (1976:31) hypothesised date for the last major occupation at the site is AD 1700-1800, allowing a direct historical approach for analysis of the late material. However, the carbon-14 evidence for a long history of occupation necessitates a comparison to material from other early Late Pre-Contact Period sites with a similar geography. A few sites have been excavated in this broad region that offer assemblages comparable to that of the Punchaw Lake site. Most of these have been subjected to little detailed scientific analysis, but the cultural features and artifacts are described and initial conclusions have often been derived. Habitation structures and projectile point types are normally highlighted as the basis for regional comparison (Borden 1953; Donahue 1970; Hudson 1973, 1974; Sewell 1950).

Montgomery's (1978) excavation and analysis of Area C at the Punchaw Lake site provides directly relevant information for intra-site comparison. She conducted a series of detailed analyses on the stone artifacts from excavations of some of the house platforms (or pits) at the north end of the site (1978). Her analysis suggested evidence for cultural continuity over the last 1200 years (Montgomery 1978:244).

Geographically speaking, the closest excavated site to Punchaw Lake is FkRo-1 at Nadsilnich Lake (West Lake), just north of Punchaw Lake. Unfortunately, it was subject only to a hurried salvage excavation (Hudson 1973). The site is located on the north shore, with southern aspect, at the outlet stream of the lake, on a flat bench above stream level. At least five circular cultural depressions were noted at the site and three of these were tested. A small assemblage was collected, with three points, including one small side-notched example. No trade goods were found, so the site was interpreted as pre-Contact. No further analysis has been completed.

Hudson also conducted a salvage excavation at GaRo-1, the Giscome site (Hudson 1974), northeast of Punchaw Lake. This site is located on Eaglet Lake, on the north shore of the outlet stream, Hay Creek. The site was badly disturbed by the construction of the modern saw-mill village at Giscome, leaving no previous cultural features or stratigraphy. However, 1500 artifacts were recovered, including a number of projectile points, drills, scrapers, knives and bones tools and one possible microblade. The faunal material is dominated by fish remains, which in view of the site location suggest a seasonal fishing camp. The site was not explicitly dated, however the point types are predominantly side notched, with some corner-notched and stemmed points that were comparable to the Alkatcho village site. The diagnostic projectile points and the lack of European trade goods suggest a pre-Contact Dakelh site.

The Chinlac site is known from A.G. Morice's (1904) *History of the northern Interior*, which describes a massacre at the village, perpetrated by the Tsilhqot'in who killed most of the inhabitants in one attack (1904:19). Chinlac was identified by a local amateur archaeologist from Vanderhoof (Sewell 1950:29), and subsequently excavated by Charles Borden (1953). This site is located on the north side of the Nechako River, next to its confluence with the Stuart River. A series of 'earth-lodges', or rectangular houses were evident in their outlines on the ground. One of these was excavated and the architectural plan fits well with the A-frame style ethnographically documented in the summer fishing villages. The artifacts collected are primarily of chipped stone, with some projectile points and an emphasis on expedient technology. Groundstone is much rarer, as are bone and antler tools. Drying pits and raised caches are identified outside the house structures. Trade with both Coastal natives and Europeans is apparent in the assemblage, which combined with the historic documentation suggest this site was occupied from the proto-contact through early contact era (Borden 1953).

Borden also excavated a single house-pit at FiSi-9, Natalkuz Lake, in the traditional territory of the Cheslatta Nation. The house-pits, point types and the assemblage in general were found to be significantly different from those at Chinlac, suggesting this site represented an earlier interior culture, not related to the Dakelh (Borden 1953:38). Most notable were the high numbers of lamellar flakes, perhaps the same flake type now known as microblades. A radiocarbon sample for the site was dated to 2415 ± 160 BP. Borden found a comparison for the house style to the south, in Teit's ethnographic work with the Shuswap, and proposed that the Dakelh were intrusive peoples from the north, who pushed the Interior Salishan peoples back south.

Looking further, south and west along the Plateau there are additional relevant excavations. Two sites in the Chilcotin area were excavated by Donahue in 1970. Algatcho (FfSk-1) is a known historic village site, located on the north shore of Gatcho Lake, with no evidence of a pre-Contact component, making it complementary to Chinlac as a contact era type site, or 'control site' (Donahue 1970, 1973). Algtacho is relevant to Punchaw as it is also located on the Nuxalk-Carrier Grease Trail. Tezli (FgSd-1) is located on Kluskus Lake, which is part of the Blackwater River watershed. Tezli was included in the Donahue's study to contrast with Algatcho, as a previously unknown house-pit site, with no identifiable contact or proto-contact component (Donahue 1977).

Key elements of the Algatcho village were coastal influenced plank longhouses, small side-notched and stemmed points, and an assemblage that compared very well with Chinlac. The site also compared well with other Athapaskan materials at sites in the Yukon. Microblades found at the site were assumed to represent an ephemeral pre-Contact component. Tezli consisted of 38 cultural depressions on the north and south sides of Kluskus Creek, where it exits the upper Kluskus Lake. Most of these depressions were between 2 and 11 meters in diameter, suggesting house pits. Five of these depressions, both house pits and storage pits, were tested, resulting in a collection of leaf-shaped, notched, concave based and convex based projectile points, and one miniature point. No microblades were noted. Donahue proposed a habitation period somewhere between Borden's Natalcuz Lake house-pit and the contact era Dakelh. He also noted poor comparison to the Anahim Lake sites, despite the similarity of the house structures, and notes that there is no evidence of coastal interaction (Donahue 1970:20).

The Anahim Lake sites referred to by Donahue were excavated by Roscoe Wilmeth in the late 1960s and early 1970s, with results published in 1978. These three sites are further still from the Punchaw Lake site, located just to the east of the Coast Mountains. However, they are located near the Grease Trail, and are associated with the Tsilqot'in, who are also in the Athapaskan language family.

The Potlatch Site (FcSi-2), the Goose Point site (FcSi-1) and Daniktco (FdSi-3) are all within a few kilometres of each other. The first two are on Anahim Lake while the third is north, on the Dean River. These excavations and the subsequent publication provide a detailed analysis and describe a complex chronology. The Potlatch site has both a plank house feature and four house-pits, the other sites are house-pit sites as well. From the combined assemblage Wilmeth proposes five 'component clusters', intentionally not referred to as phases, as there is insufficient evidence for such a formal categorization (Wilmeth 1978:153). Each of these is based on radiocarbon dates and the associated cultural materials. The first three are pre-Contact, with significant gaps between each, the fourth is the proto-Contact period and the fifth represents the Contact period.

Microblades are noted in the two earliest components, components 1 and 2, dating to *ca.* 2000-1600 BP and *ca.* 1300-1150 BP. They are associated with large corner-notched points which Wilmeth finds comparable to those in Sanger's Middle Nesikep period (1978:156-157). Component cluster 3 is poorly represented, but suggests significant cultural change from the earlier period with smaller stemmed points, a lack of microblades and a different style of house-pit. Wilmeth explains the presence of microblades in his later components as displaced from lower strata by pit excavation (1978:156). Component cluster 4 is the proto-contact period, with radiocarbon dates between 250-120 BP and the combination of trade goods and small stemmed points in a semi-subterranean house feature is evidence of the Tsilqot'in adapting this house type for their winter homes. The contact period shows clear coastal influences and greater dependency on European goods, as the fur-trade leads to cultural change. In all periods, mammal remains comprise 80% of the faunal finds (Stewart 1978), which may be a result of recovery techniques or it may indicate that hunting and trapping were not superseded by fishing in this area.

Some trends can be discerned even through this brief survey. All of the above sites have a south aspect, and are located at landmarks or changes in terrain, most at the outlet stream of a lake. Most villages have these qualities in common, the location choices are logical, although site location has been suggested to be a Dakelh response to the salmon run (MacLean 1932:146). The presence or absence of microblades is also noted at all of these sites, however, there is a tendency to assume they are from older periods, despite context.

Of greater importance to the process of analysis of the Punchaw Lake material is Matson and Magne's analysis of the projectile points from Eagle Lake (2007). While this region is quite far from Punchaw, it is in the Chilcotin and is significant in discerning the differences between Athapaskan and Salish ethnic identities in the archaeological record. Comparing the projectile points from the Eagle Lake region with those known to be of Salish and Athapaskan contexts, the contracting stemmed Kavik/Klo-kut points are known to be Athapaskan and small multi-notched triangular points are Salish. The remaining group of points all fit generally within the parameters identified as Kamloops side-notched. Using multiple discriminant analysis, distinctions could be made between Athapaskan side-notched and Salish side-notched on the basis of metrics. The Chinlac and Mouth of the Chilcotin points fell into two different groups, and the Eagle Lake material statistically fell much closer to Chinlac, and therefore Athapaskan, group (Magne and Matson 1982:63). The difficulties of assigning ethnic identity to pre-Contact material cultures are noted, however the results of this study are intriguing.

Regional Surveys

The bulk of the archaeological work in the central interior has been in the form of regional survey, inventory survey and cultural resource management survey. With little or no excavation, thousands of sites have been identified through these methods.

The 1950s surface surveys of Sewell (1950) and Borden (1953) are the earliest in the area. Sewell examined both sides of the Stuart River and much of the Nechako, identifying dozens of sites by surface features or surface finds. Borden added an extensive survey of the Nechako watershed in one of the earliest examples of cultural heritage resource management in British Columbia; salvaging what he could prior to the building of the Kenney Dam in the Nechako Canyon and the flooding of the Nechako Reservoir. Since that time an ever increasing number of surveys have been conducted to locate sites and protect the resource from logging related activities and other types of development. Of direct relevance to the study of the Punchaw Lake site are the extensive surveys conducted that were focused on either the Blackwater River and its water shed or the Alexander Mackenzie Heritage Trail/Nuxalk-Carrier Grease Trail.

In the mid-1970s Helmer spent two seasons surveying large portions of the Blackwater River watershed. In 1975 he focused on the Blackwater itself, the proximal sections of the Euchiniko, Baezaeko, Coglistiko, and Nazko Rivers, as well as parts of Nateniko and Michelle Creeks and Fishpot, Fish, Titetown, Batnuni and Euchiniko Lakes. Two hundred and ninety-three sites were identified in total, representing a relatively dense area of past human occupation. The surveyor's methodology did not include sub-surface testing and as such an even higher number of sites are plausible. Statistical analyses were conducted on these sites, leading Helmer to hypothesize cultural continuity from the pre-Contact to contact period (Helmer 1976a:98). He also suggests that his site types and distributions accurately reflect the seasonal round of the Dakelh as ethnographically documented, with larger sites on river terraces for fishing and small and medium sized sites tending to appear on lakes, reflecting the winter trapping and spring freshwater fishery (Helmer 1976a:90). The second field season completed survey of these streams and added a number of lakes to the list. An additional 185 sites were recorded using the same survey methodology. The pattern of distribution is similar, except that medium-sized sites were found on river terraces and larger sites on lakes. Helmer hypothesizes that this discrepancy is caused by different patterns of resource availability, and fall hunting (Helmer 1976b:32). He does not take the step of combining his numbers from both seasons before running them through statistical analyses, which may have made his interpretations more rigorous.

After Helmer's work, Blacklaws took over the Nazko-Kluskus field survey. In 1978 a survey was conducted that focused on forestry developments and a number of lakes in the south Vanderhoof District. Again, survey was surface only, no sub-surface testing was conducted. Dozens of sites were identified on each lake; both lithic scatters and cultural depression were represented, making for a high density of sites (Blacklaws 1978). Sites identified during this survey do not appear to trend towards specific aspects or stream features as an element of location choice, which may be a result of the judgemental survey method but is possibly a feature of occupation along these lakes and streams.

The next year Blacklaws conducted a survey intentionally designed to assess the heritage resources along the proposed route of the Alexander Mackenzie Heritage Trail (1979). This survey covered the trail from Titetown Lake west to Gatcho Lake, on the boundary of Tweedsmuir Park. A judgemental surface survey was conducted, primarily bounded to a 20m wide corridor along the trail. Forty-seven sites were located. Historic village features at Kluskus and Ulkatcho received the majority of the attention. This work was supplemented in 1980 by focusing on the traditional and contact period usage of Indian Reserves around the Kluskus Lakes (Blacklaws 1980).

Pamela Montgomery also conducted inventory survey in the Blackwater Drainage/Nazko-Kluskus research project during the 1979 field season. The survey area included the Fraser River and associated creeks and drainages, centered on the town of Quesnel and on Bouchie Lake. This project was more complex in design, incorporating an early attempt at potential mapping, quadrant sampling and systematic sub-surface testing within the samples, along with judgmental survey. Twenty-six new sites were recorded during the survey, which is considered only a small sample of the possible sites within the study area (Montgomery 1979:93). The systematic random sampling helped to confirm the intuitive notion that sites are generally located on flat terrain within 100m of water, yet it suggested that soil type and aspect were not significant variables in site location. Far more lithic sites than cultural depression sites were noted during this survey, which is contrary to the previous finds on the rivers and lakes that feed the Fraser. While most of the lithic scatters were interpreted as fishing camps, there is an absence of storage pits at these sites, suggesting food was not stored at these locations.

As foreseen by Blacklaws, the development of the Alexander Mackenzie Heritage Trail (AMHT), also known as the Nuxalk-Carrier Grease Trail, has become the focus of inventory surveys in the Blackwater area. A series of studies were conducted by Wilson throughout the 1980s that covered almost the entire length of the trail, including some areas previously covered by Blacklaws (Wilson 1983, 1985, 1986a, 1986b and 1989). At least 49 new sites were documented and a review of the condition of several previously identified sites was conducted. Minimal sub-surface testing was used, again biasing the finds to readily observable site types. In 2000 Norcan Consulting executed a survey of the first 60km of the trail, employing a judgmental and systematic sub-surface testing methodology for the first time. Seventeen new sites were identified (Canuel *et al* 2000).

Closer in proximity and relevance to the Punchaw Lake village site, the most significant of these sites was identified during this last survey. FiRs-8 is a subsurface lithic site located less than 200m east of the village site, on the east terrace of Tako Creek and the south shore of Punchaw Lake. Of 25 shovel tests at this location nine were positive for cultural material. The site was only subjected to preliminary testing to identify boundaries and 71 artifacts were found, although none were diagnostic. Site size was estimated at 46m by 21m (Canuel *et al.* 2000). No cultural depressions were noted at the site. This location may represent a use area associated with the Punchaw village, or it may represent a different and perhaps earlier occupation completely. Both possibilities could have significant impact on interpretations of the village site, and excavation of this site would be extremely useful.

Inventories have also been conducted in neighbouring drainages. In 1984 Cranny conducted a surface inventory of the Nechako and Stuart River areas, focusing on Cluculz Lake and Creek. Thirty-two sites were identified as house sites, cultural depressions and lithic scatters described as general activity areas (Cranny 1984). Cranny then combined this data with data from Chinlac site to study settlement patterns and resource distribution in the Cluculz area (Cranny 1984).

Surveys on the Nechako Plateau by Arne Carlson were conducted in a significantly different manner. Like Montgomery, a potential map based on a 1:50 000 scale NTS mapsheet was developed and smaller, select areas were subjected to a higher intensity of survey including systematic sub-surface testing in addition to surface survey (Carlson and Mitchell 1993). Again with the focus on potential modelling and predicting site locations, the analysis of the finds focused identifying key criteria in site selection. In this case proximity to a water body (within 200m) and southern exposure were found to be the most consistent variables. As with all of these inventory projects, the finds are biased due to the locations originally selected for survey and moreover smaller bodies of water are neglected. A second stage of the same project was conducted in the following field season, in the Nechako Canyon/Cheslatta Falls, which produced a remarkable density of sites (Carlson 1994). The Nechako Canyon is a distinctive geographic feature within the central Interior, with a large falls and rapids complex marking the confluence of the Cheslatta River with the Nechako at the north end of a steeply walled canyon. The result of these two rivers meeting is a large pool, ideal for salmon netting at the head of a canyon with numerous terrace levels. One hundred and thirty-one sites were discovered, including a number of house-pit sites, and the results make clear that in such unique areas of intensive use, the previously established distance from water criteria must be rejected, as sites were located at least 500m from the nearest water source in the Canyon (Carlson 1994:205). A subsequent inventory conducted by Norcan Consulting covered the area immediately west of Carlson's work in the upper reaches of the canyon. This survey found that house-pit sites continued up the canyon on terrace features to a distance of over 1km from the nearest water source (Cadden 2001). Sites were also located along all drainages feeding into the Nechako River at or near the Canyon. In this project, judgmental survey was combined with random sampling over a six kilometre square area. Contrary to predictions, two sites were located in areas previously defined as low potential, these isolated lithic finds were not associated with any significant terrain or water feature.

A large number of sites and wide variety of site types have been located along the Nuxalk-Carrier Grease Trail and associated drainages and lakes. For the most part the work is a catalogue of sites resulting from regional survey work and has not yet been subjected to detailed analysis. Some attention has been given to predictive modeling and identification of locational factors that may indicate the presence of a site, but as more work is conducted in the lower potential areas, new sites are still being identified. In general these surveys highlight the high density of sites in the area, and the need for more intensive investigations of known sites.

Summary

From this assessment it appears that house type is important in assessing the main component of a habitation site. At the Punchaw Lake site, the house platforms are dug into the side of the hill to create flat surfaces, and are not considered semi-subterranean house pits. The post moulds documented at the floor level describe an oblong structure, much like a rectangle, but with rounded corners (Fladmark 1976:24). This evidence matches with A.G. Morice's descriptions of summer huts, made in a post and beam style, on flattened soil platforms (1893:184-189). Archaeologically, it seems most similar to the proto-contact era lodges of the Chinlac site, also thought to be a summer fishing village (Borden 1953). The placement of the village is consistent with ethnographic descriptions and survey findings of the northern interior: a preference for southern exposure, along a defined topographical feature, in this case the river terrace, and associated with a water source, often at a change in flow, in this case where the Punchaw Lake flows out through Tako Creek. The difficulty with this assessment of the location is Tako Creek is quite small and not ideal for salmon. Proximity to water sources with proven salmon runs is an important factor in locating summer habitation sites.

CHAPTER 3 – THEORETICAL APPROACH

Technological organization as a theoretical framework has been the focus of much lithic analysis research over the last thirty years, particularly that dealing with smaller scale societies. The way technology is designed and used by a group should be, in some way, dependant on their environment and their social responses to the environment, especially those so closely tied to their surroundings as hunter-gatherer groups (Hayden *et al.* 1996, 2000). If this basic assumption is accepted, then it could provide a way to begin to interpret behaviour in the archaeological record.

As archaeologists have worked to develop effective methods and theories based on this concept, most studies have been focused on a specific type of technological strategy, or on a particular aspect of a tool kit, such as curation or versatility. These aspects of technology are then related to hypothetical social conditions such as degree of mobility or method of subsistence. Often vigorous debates in the archaeological literature have been generated; the concept of curation in particular has received attention (*cf.* Binford 1973, 1979; Bamforth 1986; Nash 1996; Odell 2001). However, over time it has become apparent that while developing the pieces of the puzzle separately has been necessary, a more coherent theoretical framework is needed to incorporate all of the variables of technological variation. Debates have become mired in semantics and terminology (for example Nash 1996 and Shott 1996). Divergent approaches to the same questions have proven opposite views, notably when applied to different cultural groups (Kelly 1988; Khun 1994), making generalized theory problematic. While it has long been recognized that many different factors influence a group and the way they organize their technology, it has taken a long time to approach a more holistic methodology.

Using this rich history of research and beginning in a different place, design theory, Hayden, Franco and Spafford (1996) seem to have taken a step closer to this goal of integrating the variables that affect stone tool design

Numerous technological strategies (curation, expediency, reliability, maintainability, versatility, flexibility, multi-functionality and portability) have been used to illuminate questions of social organization such as mobility, settlement pattern, resource availability, and risk assessment. By using Hayden *et al.*'s (1996) approach as a model (Hayden *et al.* 1996, 2000; Rahemtulla 2006), all of these variables can be included in the analysis of an assemblage.

Strategies of Technology, Curation vs. Expediency

One of earliest concepts that came to be developed under the umbrella of technological organization came from Binford's defence of his 'functional' arguments in the Binford-Bordes Mousterian debate (Binford 1973). Binford described the technology of the Nunamiut as "almost exclusively curated" (1973:242). This adaptive strategy he defined as tools being kept and transported for the express purpose of future use. Tools would only be discarded after they had expended all utility. Expediency, by contrast was characterized by tools made, used and discarded immediately thereafter, resulting in tools that more directly reflect their function (1973:244). Binford (1979) expanded on the topic, emphasizing that the two ideas should be viewed as a continuum of possibilities, not as diametrically opposed. Curation and expedience have become common terms in explaining assemblage variability, and to advance various theories of cultural adaptation (cf. Parry and Kelly 1987).

The inherent utility of these concepts has led to several attempts to better define curation and to develop ways of recognizing it archaeologically (Odell 2001:68). Bamforth developed five key components that could be used to define curated technologies; "...effectivc for a variety of tasks, are manufactured in anticipation of use, maintained through a number of uses, transported from locality to locality for these uses, and recycled to other tasks when no longer useful for their primary purposes" (1986:38). Bamforth's work makes the concept of curation more applicable to archaeological questions. The unit of analysis is the technological organization of the assemblage as a whole and Bamforth's (1986) use of the term curated is also set up in opposition to expediency. He predicts that curated strategies will create complex and formalized assemblages, while expedient ones will be simple and with fewer formal tool types.

Despite these attempts to make the concept more useful, criticism has continued to mount. Odell (1996) focused his energies on Bamforth's complex and multifaceted definition by considering each of the five components separately. Odell (1996:63) considered, of the five components, only multi-functionality (as represented by biface technology) and preparation in advance of use (as evidenced by hafting elements) could be developed as useful analytical tools. This limits the utility of the concept on the whole, as it can only be applied to certain discrete elements within an assemblage. Nash used a more aggressive approach to prove that 'curation' has become so vague it can be argued or proven in completely contradictory manners over the same case (1996:94-95) and argues for abandoning the term altogether. While Nash may be correct the term is also so ubiquitous that this goal seems ambitious. The term will likely continue to see usage (Odell 2001:68-69), so perhaps the most salient point of these arguments is that the term must be used it must be more strictly defined and those using it must clearly explain how it will be applied.

Shott has attempted to save the curational concept by returning to Binford's work, proposing a streamlining of the term. Putting the emphasis on properties of technology, he determines that the essential element of curation is maximizing the utility extracted from a tool (Shott 1996:267). This method is problematic in that it requires one to know the initial amount of utility in a tool and to guess how its maker would have defined utility. Tomka's (2001:209) example satisfies Nash's desire for a new term, using 'formal' in place of 'curated', setting it up in opposition to expedient and relying on Shott's concept of maximum utility as the defining feature.

These problems may be dealt with by looking at technological organization as a whole, rather than breaking it down to separate concepts to be dealt with independently, much as Binford originally intended (Binford 1973, 1979). Odell's (1996:53) work created confusion by looking at curation as a cause of variability in the tool kit, compared and contrasted with raw material availability (1996:53). Many of his concerns might be cleared if he considered it more as one possible strategy of technological response to such environmental factors as raw material availability (Nelson 1991:62). Another fundamental criticism is that it is unclear what is being curated, what is the subject of the strategy: raw material, individual tools, entire assemblages or tool-kits? Any or all of these could be subject to curation or expediency, in different manners, even within the same pattern of technological organization. Keeping and transporting materials and tools across the landscape is one possible behavioural choice in response to various influencing factors, and this behaviour will influence the design and organization of that group's technology. If curation is not the appropriate term to describe this behaviour, another will have to take its place. Following this, the term curated will be used in the analysis and discussion of the Punchaw Lake assemblage, to discuss tool types or technological strategies that appear to adhere to Bamforth's definition (1986) and are in opposition to expedient technological strategies.

Design elements

Despite the varied issues with the curation concept, the debate surrounding it and the attempts to define characteristics of these stone tool technologies has highlighted key design features that may be recognizable in stone tool assemblages. Reliability and maintainability were first proposed by Bleed (1986) as design elements while considering Binford's mobility strategies. Since then, these two concepts have received much attention as have the concepts of versatility (multi-functionality), transportability, flexibility and diversity. Again, there are issues of clarity, as with any attempt to standardize new terminology. Many of these terms have overlapping meanings, none are mutually exclusive, and care must be taken to discern whether the object of study is the tool itself, or the technological strategy as a whole (Nelson 1991).

The original definition of a reliable technology was that its "ability to function is assured" (Bleed 1986:739). For Bleed this entailed such characteristics as being overdesigned, sturdy, redundant, standardized forms, and maintained to continue functioning in the same capacity by specialized craftsmen. As such, it was proposed as the optimal strategy for Binford's (1980) notion of logistical collectors, when intensive collection of a resource demanded that the tools not fail and where 'gearing up' time was inherent in the system. Overdesigned tools are built thicker or sharper than necessary for the task, in order to minimize chance of failure, and/or with inherent back-up systems to come into play if failure does occur (multiple barbed points for example). This is interpreted as a good design choice where failure at the vital moment would be disastrous for survival (Torrence 1989). Reliability has also been proposed as an aspect of curation, in response to decreased availability of raw material, where a limited amount of lithic material means broken tools would be highly undesirable (Tomka 2001:223).

In the archaeological record, reliability would most likely be visible as a high degree of more formalized and standardized tools, with a low degree of morphological variability (Eerkens 1998:43; Tomka 2001). Standardized bifaces with a secure, sturdy hafting element indicate a specialized, intentional mode of manufacture and are quickly and easily replaced on the hafting element, an element of redundancy (Nelson 1991:66; Kelly 1988). Qualities such as heavy and sturdy components may actually reflect functional necessity, or use of higher grade stone may be an aspect of status display on a tool never even intended for use (Hayden *et al.* 1996:36).

To substitute reliability, Bleed proposed maintainable technologies which are characterized as portable, with modular or serial design, easily repaired during use or modified for a different function (1986:740). This strategy was proposed as the optimal response for highly mobile forager groups to opportunistic resource extraction, so portability and a long tool use life are emphasized (Eerkens 1998:50). The strategy is an ideal response to an environment where different food resources may be present at any time and the hunter-gatherer must be prepared to take advantage of any variety of opportunities, as opposed to predictable herd movements where hunting systems are targeted at a specific time and place (Torrence 1989:63). If a greater variety of uses can be generated from fewer tools, it allows for greater mobility (Nelson 1991).

Alternatively, maintainable technology is a possible response to limited availability of raw lithic material, as resharpening and re-formulation of a tool rather than discarding it extends the use life of the material (Bamforth 1986; Hayden 1989). Both systems have been proposed as a logical response to the same situation, highlighting that these concepts are not exclusive, but perhaps complementary design options. In the archaeological context maintainable strategies are most often aligned with visible patterns of resharpening (Shott 1986; Odell 1996; Hayden 1989). Again, bifaces can be proposed as tools that are maintainable as they can be retouched to sustain an edge, or to change the edge allowing change of function in serial design. Bifaces can also be multi-functional as tools and as a core source for flake tools (Kelly 1988:718).

Maintainable tools may be designed to work in a variety of circumstances or be easily modified to whatever situation may arise. These qualities have been subsequently developed as separate elements of the design strategy, equated to versatility (multi-functionality) or flexibility (Nelson 1991). Versatility or multi-functionality, can be defined as the number of tasks that can be performed by a single tool type (Ammerman and Feldman 1974; Kuhn 1994; Shott 1986). In the archaeological record it may be recognizable only where detailed use-wear studies can show different uses for the same tool type (Odell 1996). Some have also proposed that simplified morphologies are inherently more versatile and that the biface is one such inherently versatile form (Nelson 1991:71; Cowan 1999). Flexibility is part of the maintainable strategy as it represents tools that are easily changed or adapted to suit the needs of a situation (Nelson 1991). This concept is explicit in Bleed's original proposal and has also been advanced by Ammerman and Feldman (1974) and by Shott (1996). However, flexibility is very difficult to establish in archaeological contexts.

Portability, or transportability, as a design feature indicates that the tool-kit was made for the purpose of being transported some distance from the home to the place of use on a regular basis. Portability implies curation and a limited availability of raw material as it cannot be assumed that appropriate material will be present when the need for a tool arises (Nelson 1991:73). They must be light weight and as an assemblage would most likely include tools with versatile and/or maintainable design, to maximize utility of a limited number of tools (Torrence 1983; Kelly 1988; Kuhn 1994; Cowan 1999). As weight must be limited, a smaller number of less specialized artifacts would be optimal (Shott 1986:20). While portability is clearly important to certain subsistence strategies, it is questionable to what degree the portability concept is useful in design theory as it so greatly overlaps with the various elements already discussed.

Diversity of tool types may also be seen as a design element, if it can be assumed that the entire assemblage may have been intentionally designed as a tool-kit. A diverse collection of tools can be correlated with decreased mobility and in opposition to fewer, but more versatile tools (Shott 1986 after Ammerman and Feldman 1974). The simplest method of measuring diversity in any assemblage is to add up the number of discrete tool types (Torrence 1983). However, it would be difficult to discern the level of intentionality and to separate a tool kit designed to be diverse from one which merely developed this characteristic over time.

Most of these design elements hold value only if the assumption is made that the tool or the collection of tools was made with a purpose in mind. Odell has pointed out that there is a big difference between a tool that was designed to be multi-functional and one that was simply used in different ways (1996:57). Again it must be noted that often a single design element is selected for study and used to prove a particular adaptive strategy, later to be used to prove the opposite. Most striking is the manner in which Kelly's (1988) treatise on the biface reveals that the tool type can fit in quite well with every single design element. The object lesson must then be that these strategies cannot be considered in isolation, but as an interlocking system of design criteria wherein an optimal solution to an environmental problem may be found (Hayden *et al.* 1996, 2000; Rahemtulla 2006).

Social and Environmental Influences

Technological organization, as employed by Hayden *et al.* (1996), is the technological strategies evident in the tool and tool-kit design that will reflect the constraints, both environmental and social, that caused those choices to be made. At this juncture, behaviour and culture may be glimpsed. These constraints address together the key aspects that have been used to explain variability in assemblages. Different strategies of mobility, of resource extraction, of minimizing risk of failure, and optimizing efficiency and cost have been proposed as the most significant factors influencing the appearance, design, and variability of tool assemblages in the archaeological record particularly with reference to hunter-gatherer cultures as those most impacted by their environment. Social concerns such as complexity, ideology, and agency must also be considered. All of these can be viewed as constraints on the technological system and different environments and circumstances will cause these variables to influence that technology in different ways. Analysis of technology then may be used to discern what those circumstances were and to project a picture of the past. Incorporating all of these variables into a single framework may seem prohibitive, however it is important to attempt and this model is being developed by practical use in different cases and has potential bring real insight into archaeological assemblages.

In 1980 Binford proposed a continuum of possible subsistence strategies with logistical collectors on one end and foragers on the other. In this scheme, foragers are highly mobile, making moves to camps nearer to food resources on a continual basis, with hunters and gatherers roaming the land looking for opportunities to take food. Collectors are more sedentary and settle seasonally, making longer stays in areas and logistical forays to procure resources. While Binford's work is routinely referred to in discussions of mobility, it is actually focused on patterns of resource procurement. In this scheme, mobility is a strategic response to environment. Differences in technology are then reflective of the mobility patterns as they relate to resource procurement methods. Technological strategies are inherently tied to specific hunting strategies which in turn are defined by environmental conditions (Bleed 1986).

For some mobility is the single key factor in explaining differences in technologies used by different groups. Shott (1986:33) used extensive ethnographic data to demonstrate that there were several aspects of mobility strategies (such as frequency or distance) and that tool kit diversity was more closely related to these than to food procurement strategies or resource availability. Parry and Kelly (1987), analysing information from all of North America, determined that over time curated technologies as represented by formalized bifaces decrease and expedient ones, such as flake tools, increase. They considered increasing sedentism over this period as a given, and therefore the change in technology is a reflection of changing mobility patterns. According to Parry and Kelly (1987:299), the scale of this change, occurring everywhere over the temperate continent, suggests that environment and resource availability are not significant factors. Even so, they acknowledge the evidence that the availability of raw lithic materials is a significant concern, explaining the exceptions to their rule.

Despite the difficulties in recognizing mobility archaeologically it remains vitally important, and concepts of technological organization seems useful in identifying mobility strategies in the archaeological record (*cf.* Bamforth 1986; Kuhn 1994; Cowan 1999; Jones *et al.* 2003). Mobility and technological organization are also dependant on lithic raw material availability (Carr and Bradbury 2001:145). In design theory, raw material availability is one of the constraints that influence the design choices open to a tool maker and it may yet be identifiable within the design elements of an assemblage (Hayden et al. 1996:37).

'Curation' and conservation may be evidence of systems of technology that are designed to reduce the cost of procurement of lithic material (Hayden 1989; Jeske 1989). However it may be that relative scarcity of lithic raw materials could have minimal impact on the organization of technology as raw material procurement can be easily embedded into mobility strategies and as such convey no added cost to the system (Morrow and Jeffries 1989). This apparent dichotomy seems to be the result of similar concerns being focused on different localities. For Morrow and Jeffries, lithic material is never truly scarce, while for Hayden snow cover and frozen ground can prevent even embedded procurement for several months of the year. This situation highlights the importance of including environmental and ethnographic details into the modelling of constraints for developing a design based theory.

A third topic often raised as the most significant factor influencing technological solutions is Torrence's (1989) concept of risk. The author's theory is built upon notions regarding time stress and budgeting of energy and resources. Binford's (1980, 1983) collector-forager continuum, focusing on food procurement and hunting-foraging strategies is a basis for the development of this concept. Risk theory proposes that "…it is largely differences in the form and severity of the risk associated with each type of subsistence which largely determines variability in stone tools" (Torrence 1989:58). This is to say technological systems must be designed so as not to fail, because the consequence of failure is starvation. Different systems then will result from different patterns of resources and the intensity and/or timing of risk. Archaeologically, where risk of failure to acquire food is reduced, complexity and diversity of technology will decrease, and less standardized forms will occur. Any analysis of technological organization that focuses on the environment and food resource procurement is closely related to these ideas about risk. The design of a hunting weapon will logically be influenced by the need to be successful in the hunt and therefore design elements must be chosen that will minimize the chances of failure (Eerkens 1998:50)

Most of the theoretical discussions are based on the practicalities of life, meeting basic human needs. There are, however, other possible factors that may play a role in shaping the design of a tool kit. Social influences were perhaps the first recognized cause of variability in form, as stylistic approaches based on ethnic significance represent some of the earliest work in the field of archaeology (Trigger 1989:165). Since each piece of cultural material is the product of an individual's work, we cannot consider its form without considering individual, social, and natural influences that went into their personal choices (Sinclair 2000:200). Dobres (2000) incorporates the *chaine operatoire* concept into this perspective on technology. By looking at the entire life history of a particular, real object (rather than the tool type) moments of decision making may be seen. Understanding when and where these decisions were made, one can begin to understand the social context that informed them (Dobres 2000:164). In practice this involves complicated refitting programs to create intersite or intrasite patterns. The holistic nature of this approach is appealing, as is the almost metaphysical attempt to approach the individual in the archaeological record, rather than generalized behaviour patterns. But is it realistic, and of what value is it? This approach has yet to be shown to be broadly applicable and provide new insight into culture and human behaviour. While social agency concepts now seem set up in opposition to the technological organization approach, it would be ideal to be able to incorporate them as merely another constraint on the design variables.

While different studies have focused on different aspects, all recognize that in reality the technological strategy and design choices employed by any group are impacted by all of these factors which are not easily separated. Group mobility has always been tied to method of food procurement, which is a fundamental part of risk-reduction, all of which is largely dependant on the local environment. This is not to say that one can predict the optimal tool-kit (Torrence 1989:59), and individual choice and social mores always play a role in human behaviour.

Application of Design Theory

A generalized version of Hayden, Franco and Spafford's (1996) framework is adopted for the current research. The approach requires making certain assumptions about cultural patterns and environmental conditions, which can be accomplished with paleoclimatological research and a cautious reliance on the ethnographic record (Hayden *et al.* 1996; Rahemtulla 2006). In the central interior there is a reasonably detailed ethnographic record, to provide information about cultural patterns of interaction with the environment within the proto-contact and contact periods (cf. Morice 1893, 1910; Goldman 1940). Issues regarding cultural continuity in this region have been extensively debated, and no clear consensus has yet been achieved (Helmer 1977; Magne and Matson 1982), however all groups known in the interior have similar resource extraction strategies. Richards and Rousseau (1987) have constructed a generalized culture history framework for the central interior that is widely accepted and will serve well for the purposes of this study. Furthermore, earlier work at the Punchaw Lake site seems to indicate that no major cultural shifts can be observed in the material for at least the last 1500 years, and cultural continuity is assumed (Montgomery 1978).

Given these assumptions, the material at the Punchaw Lake site can be addressed; as lithics dominate the assemblage, it seems well suited to a design based analysis of technological organization. Important questions of Interior Plateau settlement pattern, resource use and mobility can be focused on. However, this is ambitious given that only a small percentage of the site is excavated and the chronology cannot be easily established. The first enquiry must be to understand how the pre-Contact inhabitants of the Punchaw Lake village were using the landscape and the resources available to them.

Design theory and technological organization incorporates ethnographic evidence (cf. Binford 1973, 1980; Hayden 1976; Rahemtulla 2006; Shott 1996), which here will also include recollections of the Nazko First Nation Elders. The design theory approach in particular involves drawing on all regional and ethnographic knowledge available in order to better understand the specific constraints impacting tool design (Hayden *et al.* 1996). Based on these precedents, the information gathered from the Nazko First Nation can help to inform the expected design constraints. When specific tools elicit a response from participants, that information can be directly applied to better understanding that tool type. The ways in which the input and information given by the Nazko participants have enriched this study will then be highlighted in the conclusion.

To apply the design theory approach towards the understanding of the technological organization at Punchaw Lake, the relevant ethnographic and environmental information is employed to estimate the variables likely to have influenced tool-kit design (Hayden *et al.* 2000; Rahemtulla 2006). Assumptions regarding village activities, mobility and settlement patterns in the late pre-Contact period can then be tested against the analysis of the tool-kit. Since use-wear and debitage analysis are not within the parameters of this study, some suppositions must be made regarding tool use, types and technological strategies based on relevant research in the central interior.

The influencing factors can be grouped as design constraints and are summarized in five categories according to Hayden *et al.* (1996, 2000); task constraints, material constraints, technological constraints, socioeconomic constraints and prestige/ideological constraints. Task requirements are concerned with the specific job(s) a tool is required to perform and expectations of function. Material constraints include quality and availability of lithic materials and costs of acquiring these materials. State of technological development, costs of manufacture and maintenance and technical skill requirements constitute technological constraints. Socioeconomic constraints include mobility and resource extraction patterns, transportation, available labour and capacity for storage. Ideological and prestige constraints are the hardest to define, dealing with stylistic choices, aesthetics, conformity and status. There is some overlap and close relationships between these categories, for example raw material availability will influence tool design on its own and it may also affect cost of manufacture, which influences the design as well. However the categories are helpful in organizing and defining the expectations of the design considerations and resultant strategies. Information drawn from ethnographic and environmental backgrounds outlined in Chapter Two will inform the expectations for relevant constraints in each category to suggest possible design concerns and tool production strategies.

Task Requirements

The following list of tasks expected to have been part of life at the Punchaw Lake site is based on the assumption that the site was a village, given the number of houses and overall size and density of the occupation (Fladmark 1976). The platform house style, as opposed to pit style houses, supports the assumption that this site was primarily occupied in the summer and fall in order to capitalize on the salmon runs, although there is the possibility of a mid-winter stay in order to capitalize on the salmon stores (Morice 1893). A village was a strategic stop off during travel between different resource locations (Peter Louis, Quesnel and District Museum and Archives 2008) operating somewhat like a 'home base'. Further supposition is based largely on A.G. Morice's ethnoarcheaological notes, some intuitive reasoning and the rich body of literature regarding hunter-gatherers and archaeological analogies (*cf.* Ascher 1961; Binford 1967; Hayden *et al.* 1996; Rahemtulla 2006:116; Trigger 1989). The Nazko Elders did not have direct memories relating to the Punchaw Lake site or area directly, however there are stories of village life. The possible tasks identified by the author are limited to those with a probable stone tool component.

Salmon fishing and processing is given as a key component of village life as the primary reason for summer gathering. This would involve such tasks as gutting and filleting of fish, preparing nets, weirs, baskets, and traps, construction and maintenance of drying racks and sheds and manufacture of harpoons/spears, shafts and heads. While modern water levels in Punchaw Lake and Taco Creek do not suggest a significant salmon run, Chinook salmon have been observed in Tako Creek (Province of British Columbia, 2010) and the creek may have been higher in the past. Fishing activities would still likely been part of life at the Punchaw village site as the lake itself would have freshwater species and both Blackwater River and the Fraser River were not too distant. Construction and maintenance of village structures, including houses, sweat lodges and raised caches would also be important activities, particularly after returning from long seasons away. Construction and maintenance of canoes, paddles, and travelling gear would be necessary to prepare for up coming forays, as would construction and maintenance of a hunting and trapping tool kit in preparation for logistical hunting and trapping trips in winter and spring. Gathering and processing plant materials for food, containers, and various other needs would be on-going throughout the growing season. Preparation of hides for clothing and other needs as well as maintenance of older hide items would also be an on-going concern. Weapons would need to be constructed and maintained as battles were not uncommon (J. Morris Boyd, Interview, December 11, 2009). If wood was carved for ideological or symbolic purposes it may also have been a village activity.

This list takes into consideration the possibility of a return to the village site in the winter, bringing meat and skins to the village from winter camps for further processing, storage or use. While it is a generalized list; each task could be sub-divided into numerous component parts. This is not intended to be a complete list, but to highlight the types of tasks most significant to a Dakelh village lifestyle in the central interior. The variety of tasks noted here would require a complex tool kit with a variety of shapes and sizes, and likely some specialized tools.

Raw Material

Unfortunately there is currently limited information regarding the lithic sources available within the Blackwater watershed, and their proximity to the Punchaw Lake site. Almost 80% of the chipped stone assemblage is comprised of fine grained trachydacite, dacite and rhyolite, with some poorer quality basaltic material, a variety of high quality chalcedonies and some obsidian and quartzite. Ground stone is rare in the assemblage, constituting only 1.15% of the tool collection, and is a mix of shist, shale, argillite and greenstone.

The trachydacite, dacite, basalt and rhyolite are extrusive igneous rocks and can be found in and near the batholith of the Coast Mountain Range. The closest known source is the Baezaeko quarry approximately 70km southwest of the Punchaw Lake site, however closer sources may exist. In a random sample of 18 lithic flakes from the Punchaw village assemblage tested, potentially six different provenances were identified (Bruechert 2010). The locations of these provenances are unknown. All of these igneous rocks can also be found in cobble form in the glacial till and gravel beds of the rivers. In the field notes for the Punchaw Lake site Fladmark visually identified Mount Edziza, Anahim and Ilgachuz as the sources of the obsidian within the lithic assemblage. A quick visual survey of the chert material in the assemblage also suggests several sources for this sedimentary rock. A wide variety of colours and textures can be identified. The closest documented quarry, FlSb-6, is just south of the community of Vanderhoof, presenting a white, pink and red banded and mottled rhodonite material (Carlson 1996) that compares well with some of the FiRs-1 material. Some chert like material can also be found just south of the Punchaw Lake in outcroppings along the Blackwater River; however it is not a high quality material as it is prone to shattering and based on visual comparison of observable characteristics with materials in the archaeological collection it does not appear to have been used at the site.

The diversity of raw lithic materials from several sources suggests a variety of acquisition strategies. Trade, particularly for the obsidian, is expected given the location of the site along the Grease Trail. Canoes were known to be one of the most common methods of travel in the interior of British Columbia (Dawson 1881; Mackenzie 1970), which would reduce the costs to the group of opportunistically and/or purposefully travelling to quarries or selecting cobbles from river gravels during travel. Acquiring lithic materials may also have been part of the logistical trips to hunting camps. During the winter season access to most sources would have been inaccessible, however lithic materials may have been collected in the spring on the journey back to the village for summer.

The variety of raw material sources being exploited could indicate different materials were preferred for different uses or tool types. Technologies focused on conservation of material may then be noted for certain raw materials, but not in others. The wide variety may indicate a difficulty in acquiring high quality stone and a constant scavenging or trading for the preferred material. Conversely it may also mean a near constant supply was available from so many different sources the there was no need to be more selective. Clearly further work in material sourcing in the central interior of British Columbia will be very beneficial.

Technological Constraints

The peoples of the Late Period in the central interior of British Columbia had developed a wide variety of technologies to make the most of the resources available to them. For example, numerous styles of fish weirs and traps were utilized as well as harpoons or leisters of several styles and various fishing lures and bait hooks, allowing access to different species of fish in all different conditions (J. Morris Boyd, Interview, December 11, 2009; Morice 1893). This variety of technology is most readily observable archaeologically in the wide array of biface styles that are apparent, likely intended for a different uses. Tool specialization may be noted in key-shaped unifaces, awls, drills and the assortment of scraper styles. Both expedient and curated technologies would benefit different aspects of the logistical hunting, fishing, and gathering subsistence strategies. Production costs would be most directly tied to access of raw material and pressure to have the necessary tools prepared in advance of the salmon run and the seasonal move to hunting camps. Risk would rise in the winter as small family groups would need to acquire some large game and have success with trapping and ice-fishing to survive the cold winter conditions. This risk would be augmented should insufficient salmon have been caught and cured for storage the previous season.

The environment in the central interior of British Columbia would also impact the types of technologies required to fully take advantage of the resource base. A diversity of wildlife was hunted, trapped, and fished in a variety of ways to maximize the return. Fur bearing mammals were trapped and snared in many ways depending on habits and habitat. Large game species such as caribou, deer, or bear, also each have different habits and would need to be hunted in different areas at different times, necessitating varied hunting strategies.

Socioeconomic Constraints

Group size and mobility are constraints closely tied to the seasonal round and the socioeconomic constraints of life in the Subalpine Zone. The Dakelh practiced a type of logistical collector subsistence strategy (Binford 1980) in which a main base camp or village is located to take advantage of major resources and this is supplemented by longer hunting trips out to smaller or more dispersed resource patches. In the case of the Dakelh these trips are not accomplished by mobile groups of hunters, but by entire family groups with the village being abandoned in the process until the next seasonal gathering. This pattern would indicate a need for several types of technologies. Expedient tools would be useful in the village as a large group would likely have the material resources and the wide variety of tasks that required non-specific tools. However, more formalized and 'curated' technologies might be ideal for portability to carry out to winter hunting lodges, as their location was changed from year to year. Given that the travel to the hunting site and the majority of the hunting was conducted during snow covered winter conditions, the tool kit would have to be prepared in advance at the village and be reliable and maintainable to last the duration of the season with a minimal number of tools to carry (Bleed 1986; Parry and Kelly 1987). Every hunter would probably know how to maintain and/or resharpen his tools and possibly to make new ones should key components break at critical moments.

Key time pressures on the technologies of the residents would be the ever changing seasons and the time limit of the salmon run. This would require sufficient raw materials and tool making opportunities in the village as a group prior to the salmon run and the subsequent dispersal to hunting groups. The majority of construction, tool fabrication and maintenance would likely occur in early summer in the villages. Storage possibilities presented by the annual or biannual return to the same village would however help to reduce some of this pressure. Storage in above ground and below ground caches allowed not only for surplus food to be stored, but excess raw lithic material, finished tools and site furniture. Storage could also occur anywhere in the territory, allowing for some accessible resources regardless of location. Nazko Elders (Ellie Peters, J. Morris Boyd, Doreen Patrick: Personal Communications November 20 and December 11, 2009) recall cache pitting to store excess food wherever on the landscape; the excess was processed and dried. This minimized transportation concerns of processed food and minimized need to return to village site to access stores, reducing risk.

Ideological and Prestige Constraints

Unfortunately little can be presumed in this category. Some rare or attractive raw materials may have been reserved for higher status individuals or families; however this would be impossible to identify in the archaeological record without larger scale excavations. Aspects of stylistic variations such as projectile point types may be related to cultural ideals or aesthetics, again this cannot be proven archaeologically. Furthermore, much of the ethnographic information regarding Dakelh peoples suggests that there was little social stratification within groups until late adoption of clan system by some groups in the proto-contact era (Tobey 1981). The lack of a concrete understanding of the variables inherent in this category makes it impracticable for the purposes of this study and it will not be extensively considered in this research.

Summary

Situated within design theory (Horsfall 1987; Hayden *et al.* 1996, 2000), these anticipated constraints are thought to have influenced the design decisions that resulted in the tools in the Punchaw Lake site assemblage. As the constraints are informed by the environmental and culture of the site and the people who lived there, these influences are expected to be reflected in the tool design and the assemblage. In the practical application, the typology of the stone tools is based on identification of morphologies that indicate different design decisions were being made. The traditional knowledge contributed by the Elders of the Nazko First Nation is integrated both into the understanding of the constraints and into the interpretation and discussion of the artifacts, bringing a contemporary perspective to the understanding of the cultural environment of the Punchaw village site. The analysis of the typology may then suggest patterns that reflect the technological strategies utilized by the inhabitants of the village. These strategies may be seen, in part, as responses to the constraints affecting the design of lithic technology at Punchaw Lake and assessing these strategies in this context could aid in understanding the decision of the toolmakers at this village site.

CHAPTER 4 – ANALYSIS OF ARTIFACTS

This chapter consists of the analysis of the lithic assemblage from the Punchaw Lake site. The typological system utilized to quantify the variation and frequency within the collection is derived from an intuitive technological approach combined with traditionally established archaeological types. In order to frame the type division within design theory, attention was focused on evidence of conscious design decisions and intentional tool form. This follows Collins' ideas regarding typology and is currently the prevailing methodology (Collins 1975; Rahemtulla 2006). Following the outline of the general classification scheme each type will be described and discussed in detail. Wherever information and observations from Elders of the Nazko First Nation relate to specific types or artifacts, this information is included in the discussion of that type. This is followed by an analysis and discussion of the lithic technologies identified at the site and the implications of the interpretations and stories of the Nazko Elders.

Method

Classification is based primarily with reference to recognizable tool types utilized in this region and with divisions between types made where differing design decisions might be inferred. Design decisions are thought to be reflected in a number of physical variables. The variables considered include, the number of worked edges, shape of edge, edge angle, tool size, weight, and raw material. The definition for the term tool as used in this study is "an object secondarily modified through retouch or grinding, or one that has been manufactured through a specialized technique" (Odell 2003:4). Debitage analysis was not included in this work as it would add an excessive logistical complexity to the project. Given the difficult nature of the stratigraphy, the mixed assemblage, and field collection techniques not designed for retention of the smallest sizes, simpler methods such as mass analysis would likely not be appropriate (Ahler 1989; Larson 2004). Time and facility constraints prevented a flake attribute based approach to the debitage (Bradbury and Carr 1995). Debitage analysis of the Punchaw Lake site would likely be a fruitful future research project. Of the catalogued artifacts of the Punchaw Lake site 5080 pieces were classified as debitage and hundreds more pieces of smaller size that were not catalogued are in level bags in the collection.

All artifacts identified as tools were inspected under incandescent light at an oblique angle to aid in identification of worked areas. A hand lens was occasionally used to observe edges and surfaces for evidence of usewear, grinding or polish. Monostat dial callipers were used to measure the length, width and thickness of all tools to the nearest millimetre and an Ohaus Dial-o-gram triple beam balance scale was used to weigh each artifact to the nearest tenth of a gram.

The classification scheme consists of nine general categories defined principally by the primary reduction technique utilized to create the form: projectile points, bifaces, unifaces, unimarginal, bimarginal (Magne 1985; Odell 2003:45), blade tools, cortical spall tools, groundstone and cores. Each of these categories is then further divided into types based on similarities of form and technique of manufacture (Table 4). The principle question guiding delineation of types was whether the differences or similarities between two tools appeared to be based on decisions the maker would have likely consciously made. For example, the maker of a tool must make a conscious decision as

Projectile Points	
Small Side-notched	31
Large Side-notched	7
Corner-notched, convex base	1
Corner-notched, concave base	2
Corner-notched, Plateau Horizon	11
Stemmed	13
Stemmed, concave base	5
Lancolate	1
Leaf-shaped	4
Triangular	11
Pentagonal	2
Fragments, potentially distinctive	20
Fragments, tip only	31
Bifaces	
Early stage	31
Early stage biface, fragment	72
Discoid	8
Sub-ovoid/rectangular biface	15
Sub-ovoid/rectangular biface, fragment	46
Backed bifacial edge	11
Bimarginal sub-triangular	10
Pointed biface	3
Hand-axe	5
Miscellaneous biface form	1
Biface reduction flakes	36
Unifaces	
Uniface miscellaneous	59
Uniface miscellaneous, fragment	49
Backed unifacial edge	5
Backed uniface edge, fragment	7
Sub-ovoid uniface	7
Sub-ovoid uniface, fragment	13
Key-shaped uniface	17
Notch	7
Unifacial graver	22
Concave edge scraper	8
End scraper	32
Convex edge scraper	32
Circular scraper	6
Awl with endscraper	2
Awl	6
Unidirectional core scraper	2
Miscellaneous edge scraper	8
Miscellaneous scraper, fragment	10
Blade Tools	
Macroblade blanks	19
Macroblade retouched	8
Blade end tool	3
Blade tool fragment	9
Microblades	19
Unimarginal Tools	
Concave edge margin	52
Convex edge margin	66
Straight edge	105
Multiple edge margins	87
Multiple edges, convex projection	55
Bimarginal Tools	
Single edge	43
Multiple edges	76
Contiguous single edge	23
Cortical Spall Tools	
Cortical spall scraper	27
Tchithos	6
Groundstone	
Carving	1
Broad Axe-head	1
Miscellaneous ground stone	4
Flake fragment, unidentifiable tool	8
Tool fragment	5
Miscellaneous tools	8
Cores	
Blade cores	6
Bipolar cores	16
Unidirectional cores	30
Multidirectional cores	114
Tool Total	**1464**

Table 4: Technological classification of the Punchaw Lake lithic assemblage

to how many worked edges a tool requires for the job or jobs intended. Also concave and convex edges are best suited to different applications, and the maker of a tool would likely select an edge shape based on the job he/she intended to perform. This process has resulted in 67 tool types in 10 categories, a large number that is reflective of the large numbers of tools in the assemblage. Even in categories that are clearly expedient, as the marginal tools, different edge shapes are required for different jobs and that tool a choice is reflected in the final product. Projectile point types are classified according to generally accepted typologies for this region, primarily from Richards and Rousseau (1987), to indicate variety of form and to identify a timeline for site occupation.

Projectile points are a specialized type of biface; and so they are in a different category separate from the biface group. Bifaces are tools with reduction flakes scars on both faces of the tool that are over 5mm towards the center. They may be the result of core reduction or based on large primary flakes. Some of the tools within the biface category have only one bifacial edge, but this edge is the defining feature of the artifact. Unifacial tools are defined as being worked on only one surface of the tool to over 5mm towards the center, to differentiate them from marginal tools (Magne 1985). Unifacial tools are based on flake blanks, the unworked side of the tool is usually identifiable as the ventral surface of a flake. Unimarginal tools are flake blanks which have retouched edges that do not extend further that 5mm and the retouch is confined to only one surface of the tool, although multiple edges may be retouched. Bimarginal tools are retouched along one or more edges, with flake scars no longer than 5mm, on both faces of the flake blank. The term 'marginal' for this type of narrow edge working was first described by Magne (1985) and suitably describes these tool types that are quite numerous at Punchaw Lake. Blade tools are a type of unifacial or unimarginal tool that are based on a specific type of flake blank, the blade. A blade has two parallel edges, is at least twice as long as it is wide and has a dorsal ridge resulting from a specific style of core reduction (Crabtree 1999:28). Cortical spall tools are based on large, relatively thin cortical spalls of coarse grain raw materials such as quartzite. Groundstone is defined by evidence of grinding and polishing hard and dense stone to create the form, rather than chipping. The miscellaneous tool category is reserved for tools that have been formed by more than one primary reduction technique. Cores are any piece of raw material that does not fit into the above categories that shows flake scars, but has not been shaped or formed in any specific manner. Bifaces, for example, may be used as cores (Kelly 1988) but have a morphology that fits the description of bifaces.

Raw materials within each tool category are grouped into general categories of rock type based on observed characteristics at the macroscopic level, such as colour and texture and with reference to Chesterman (1979) and Leudtke (1992). The term basaltic, meaning basalt-like in appearance, is used here as a catch-all for extrusive igneous rocks, including basalt, dacite, trachydacite and rhyolite (Bakewell 2000:270). Geochemical analysis in the central interior of British Columbia has shown that materials identified basalt at archaeological sites are more commonly trachydacite, dacite or rhyolite (Bakewell 1994; Mallory-Greenough *et al* 2002). These materials are very difficult to differentiate based solely on macroscopic observations, therefore they were not differentiated for the purposes of this research. However current geochemical research on the Punchaw Lake assemblage suggests that basaltic materials present are primarily dacite and trachydacite from at least six different sources (Bruechert 2010). The term chert is used to describe all varieties of chalcedonies, cherts and flints. Again, these materials are grouped together as they are very difficult to differentiate based on macroscopic characteristics (Bakewell 2000). Four different sources were identified for the obsidian materials, based on a observational analysis conducted by Knut Fladmark and included in his 1973 field notes. Other materials identified within the lithic assemblage include quartzite, greenstone and minor amounts of other igneous and metamorphic rocks. The implications for the raw material identified on the site will be discussed later in this chapter.

The methodology for the conducting research with the Nazko First Nation was developed with the Nation after the project was initially present at a meeting with their resource management team. At this meeting the Nazko representatives suggested that a suitable approach would be to bring the artifacts to the Elders, to give them opportunity to see and touch them and to voice their ideas and responses. From this time the project was given to Doreen Patrick, as representative and coordinator of the Nazko Elders. Over a series of phone conversations with Doreen, the approach developed was to complete the initial analysis and bring this information with a sample of all the artefact types to an occasion where the Elders would already be gathered. This would facilitate the Elders involvement, as they live in different communities, some distant from the office in Quesnel, and often only gather for scheduled meetings. Rather than a formal interview format, it was decided that a conversational dialogue, inspired by and focused on the artifacts would be appropriate. A series of interview questions were developed and agreed upon, which could be used to guide discussion if necessary.

After the artifacts were all sorted into type, one or two clear examples of each type and site maps were brought to the Nazko First Nation at their offices in Quesnel. This meeting was timed to fall immediately following a previously scheduled Elders gathering. Doreen Patrick, as Elder and the language coordinator, invited any elder who was interested to participate and view the artifacts. Lucy Laurent, Dorothy Nome and Ellie Peters all chose to stay and share their knowledge and agreed to have the process recorded on digital video. The Elders spoke at times in the Dakelh language which Doreen translated during the conversation. All of the tool samples were brought out one by one or in groups of similar types (for example, different scraper shapes were shown together) while describing the archaeological interpretation or classification of the type. The Elders handled and inspected the tools, choosing to comment on those that held some significance or familiarity for them. These responses often inspired stories and memories from the group. Beyond the tools themselves the Elders were asked to share their knowledge regarding the Punchaw Lake village site or the area, the seasonal round and village life and activities in general. Among the women there was no direct knowledge of Punchaw Lake itself, and the Ellie Peters suggested that Doreen Patrick's father had been on the land in that area often and might be interested in sharing his knowledge. A second visit with Doreen Patrick and with her father J. Morris Boyd took place two weeks later at the Nazko village. The same process was followed. While Mr. Boyd also did not have direct knowledge or memories of the Punchaw site, he was familiar with the area and shared some stories of the Blackwater River and fishing.

All of the community members involved were very interested in the tools and indicated an appreciation for the opportunity to view artifacts and to share stories. The resulting conversations were later transcribed from the digital recordings and all copies of the video recording and transcriptions. These recordings and the transcripts were then submitted to Doreen Patrick for review, to ensure that translations were correct and to confirm that this information was approved for incorporation in the final research. These documents will be given back to the Nazko First Nation at the completion of the project, to be used at their discretion in the future.

Visiting the Punchaw Lake site with the Elders would have been a valuable addition to the conversation. Established ethnoarchaeological programs have used site visits successfully to inspire discussion about the site and its features and how they relate to the landscape and history (Ferguson and Colwell-Chanthaphonh 2006). Unfortunately, this portion of the study was conducted during the winter months and the walk in to the site with the Elders was not feasible. Future work in this direction should certainly include a site visit with as many participants as can make the journey.

The information provided by the Nazko Elders was subsequently incorporated into the analysis. Where specific tool types inspired stories or memories of aspects of function, this information is included in the type descriptions below. In the discussion section that follows, the information shared by the Nazko Elders will be specifically addressed as it pertains to the interpretation of the site. These include land use, tool use, subsistence activities and village histories.

Projectile Points

Small Side-notched Points

	Max	Min	Avg
Length	32	15	23.5
Width	24	08	14.3
Thickness	08	02	03.8
Weight	6.5	0.4	1.47

Material	Count
Basaltic	29
Obsidian	0
Chert	2

A total of thirty-two small side notched points were recovered during the Punchaw Lake excavations (Fig. 6). This point type is very common and is found across the central interior in association with the Kamloops Horizon, dated to 1200-200 BP. These points are small, with an average length of 2.04 cm and width of 1.32 cm. Opposing side notches are also small, and the base is straight (Richards and Rousseau 1987:43). The more northerly Athapaskan influenced small side-notched points tend to have a longer blade, more concave bases, and with shallower notches (Matson and Magne 2007; Magne and Matson 2008). This type was noted within the Punchaw Lake assemblage when it was originally identified as a distinct variation (Magne and Matson 1982).

Most of the small side-notched points at FiRs-1 are typical, although there is some variation. Points 4300 and 5411 (Fig. 6) have a distinct asymmetrical base with a secondary notch on one side. Point 5363 (Fig. 6) is a multi-notched variation identified within the small side-notched point type as more typical of southern Salish-influenced points in the Plateau Pit-house Tradition and dated to 400-100 BP (Richards and Rousseau 1987:45).

Lucy Laurent, of the Nazko First Nation, has a point that her father made, that is similar to the small side-notched projectile points. That stone tool manufacture was retained in the collective memories well into the contact period is quite significant. She indicated that it is approximately 30mm in length and does not know exactly how long ago it was made, but it is a treasured heirloom (Personal communication, November 20, 2009). J. Morris Boyd indicated that these points were used as arrowheads and that arrows were a key weapon in the wars that occurred in the 1700s between neighbouring

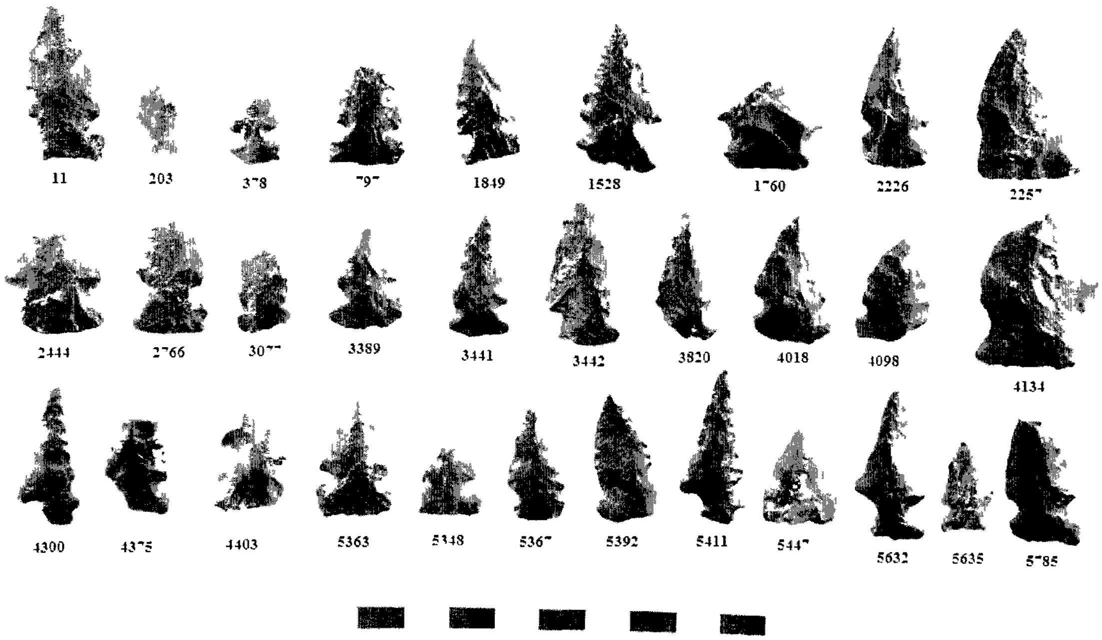

Figure 6: Small side-notched projectile points

Nations. After the wars they were used as a test of skill and adventure, to see who could shoot the furthest. The location for the village of Kluskus was determined by shooting an arrow far into the bush and locating the site of its landing (Boyd, Personal communication, December 11, 2009). Points from earlier periods were also occasionally found and reused. They could be rehafted on a feathered shaft and thrown over hand, like a dart or javelin at a target in a game or test of skill (J. Morris Boyd, Personal communication, December 11, 2009).

Large Side-notched Points

	Max	Min	Avg
Length	55	40	44.8
Width	36	15	23.3
Thickness	08	03	06.0
Weight	68	24	52 3

Material	Count
Basaltic	5
Obsidian	0
Chert	2

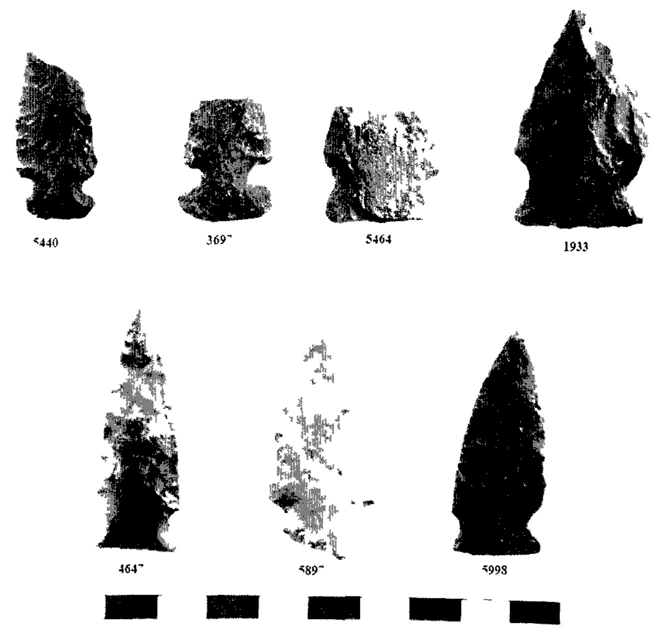

Figure 7: Large side-notched projectile points

Three complete large side notched points were recovered during the Punchaw Lake excavations (Fig. 7). Four additional points belong in this classification, but have missing tips and therefore are not included in the metrics. These points are opposed side notched points with triangular blades and straight basal margins. They are differentiated from the smaller version by having a complete length over 3.5 cm (Montgomery 1978:128). They are commonly placed with the smaller version in the Kamloops Horizon, from 1200-200 BP (Richards and Rousseau 1987:44), as part of the continuum of side-notched points. Richards and Rousseau suggest that they are temporally restricted to the end of the Kamloops Horizon (1987:43). Magne and Matson (2008:283) suggest this point type dates to 4000-1200 BP based on largely on Fladmark's finds at Mount Edziza. However the Mount Edziza large side-notched points have lengths from 5.0 to 7.0 cm, making them larger points than those found at Punchaw Lake.

Pentagonal Points

	Max	Min	Avg
Length	40	37	38.5
Width	19	18	18.5
Thickness	07	05	06 0
Weight	4.1	4.0	4.05

Material	Count
Basaltic	0
Obsidian	0
Chert	2

Pentagonal points are considered clearly diagnostic to the Kamloops Horizon. They have straight basal edges, and a foliate shaped blade with straight edges, giving a clear impression of pentagonal shape. The form is often considered to be a knife blade and is commonly between 5-10 cm long, however the pentagonal shape is the result of routine re-sharpening, so shorter versions are known (Rousseau 2008:241). The two pentagonal points in the FiRs-1 collection are short for the type, but are distinctively shaped. Both specimens 432 and 2665 (Fig. 8) show asymmetrical biconvex transverse cross sections, a sort of twisting of the blade that indicates resharpening (Andrefsky 1998:37). Both are also made on fine chert materials, but with different visual characteristics.

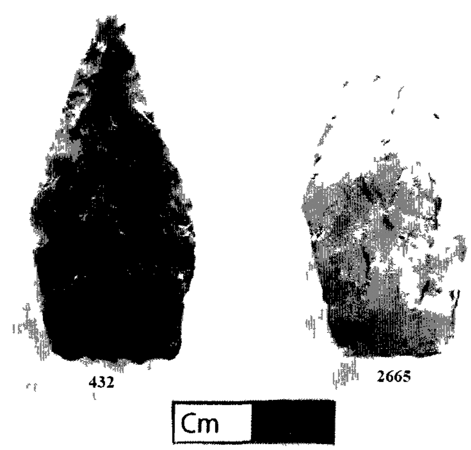

Figure 8: Pentagonal projectile points

Plateau Corner-notched Points

	Max	Min	Avg
Length	62	24	44.5
Width	36	14	22.7
Thickness	06	02	04.5
Weight	10.3	2.0	5.45

Material	Count
Basaltic	10
Obsidian	0
Chert	1

Eleven points in the assemblage are classified within the classic Plateau Horizon corner notched point type, and are dated between 2400-1200 BP (Fig. 9). Only six of these points are sufficiently complete to be included in the metrics. These points are bilaterally barbed due to deep corner or basal notches. Blade edges are slightly convex to straight while basal edges are straight. There is speculation that the larger points within this group are for tipping atlatl darts or spears (Richards and Rousseau 1987:34). The earliest examples of these points may pre-date the Plateau Horizon, at some sites they are found in contexts that range from 4000-1200 BP (Magne and Matson 2008:283). Point 2912 has concave blade edges and 6329 (Fig. 9) is quite stubby, with a very short blade

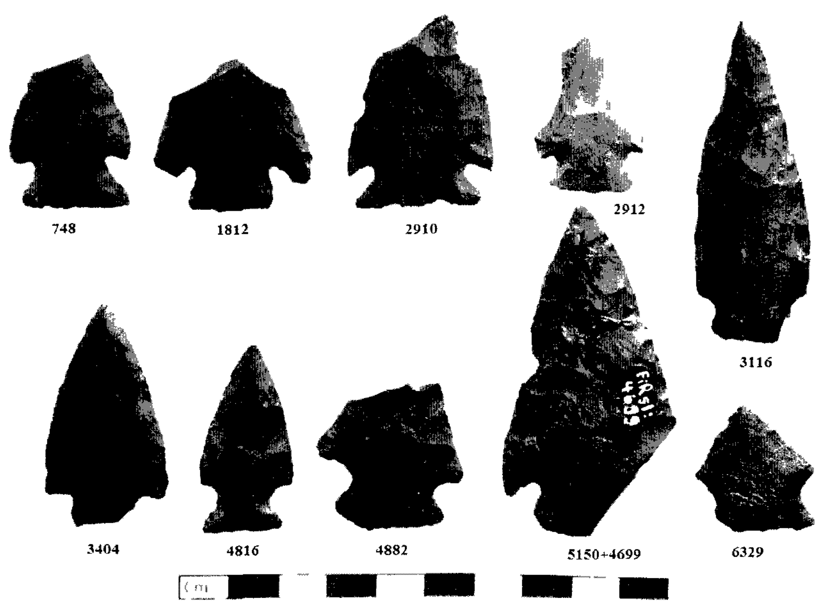

Figure 9: Plateau corner-notched projectile points

Figure 10: Basal-notched Plateau projectile point, FiRs-1:5304

compared to the base and both of these points show some evidence of resharpening. Only point 5304 (Fig. 10) is basal notched, with well defined shoulder tangs that extend past the basal edge. This point is also the thinnest.

Corner-notched point with convex base

	Max	Min	Avg
Length	23	23	23
Width	14	14	14
Thickness	03	03	03
Weight	1.2	1.2	1.2

Material	Count
Basaltic	1
Obsidian	0
Chert	0

There is only one almost complete point of this type within the 1973 Punchaw Lake assemblage (Fig. 11); however eight of these points were identified within the 1974 excavations in Area C (Montgomery 1978). Smaller than other corner notched points, defining features are expanding stems, convex basal edge and convex blade edges. These points are an arrowhead variation on the Plateau Horizon corner notched points, appearing between 1700-1500 BP and continuing through the Horizon to 1200 BP (Richards and Rousseau 1987:34).

Point 1153 (Fig. 11) is not in very good condition, being chipped at the tip and along the edge of one shoulder and base. One surface is not worked and is flat, indicating the point was made on a flake blank. The basaltic material is rather coarse, compared to the rest of the collection.

Figure 11: Corner-notched with convex base, FiRs-1:1153

<u>Corner-notched point with concave base</u>

	Max	Min	Avg
Length	43	43	43.0
Width	24	24	24.0
Thickness	08	08	08.0
Weight	0.6	0.6	0.60

Material	Count
Basaltic	0
Obsidian	0
Chert	2

Figure 12: Corner-notched with concave base, Plateau projectile point

These points are defined as corner-notched with triangular blades and expanding stems that are narrower than the blades; the basal margin is concave. This represents another variation on the corner notched points of the Plateau Horizon, dated to 2400-1220 BP (Richards and Rousseau 1987:34). Only one of the two corner-notched, concave base points is a sufficiently complete example of this variation to provide reliable metrics. Both points are of chert but two different varieties of the raw material. Items 4645 and 4646 (Fig. 12) are refitted to create the full point which has bevelled edges that suggest some re-sharpening of the blade. Item 5461 is a point fragment; however it is a basal portion sufficient to identify the point type.

Triangular point

	Max	Min	Avg
Length	47	20	30.3
Width	35	12	20 5
Thickness	07	03	04.5
Weight	8 2	0.6	3.43

Material	Count
Basaltic	9
Obsidian	0
Chert	2

These eleven points are triangular blades with straight basal and blade edges and no notching (Fig. 13). Nine of these points are made with varying qualities of basaltic material, however two are of two different variants of chert. Only six are complete and are included in the metrics. They are all quite thin and are likely preforms for corner or side notched point types, and therefore belonging to the Plateau or Kamloops Horizon, dating to 2400-200BP (Rousseau 2008:239). The form may also be intended for use as a knife blade. Richards and Rousseau (1987:44, Fig22, c'-f') do not discuss the point type, but it is illustrated in the Kamloops assemblage.

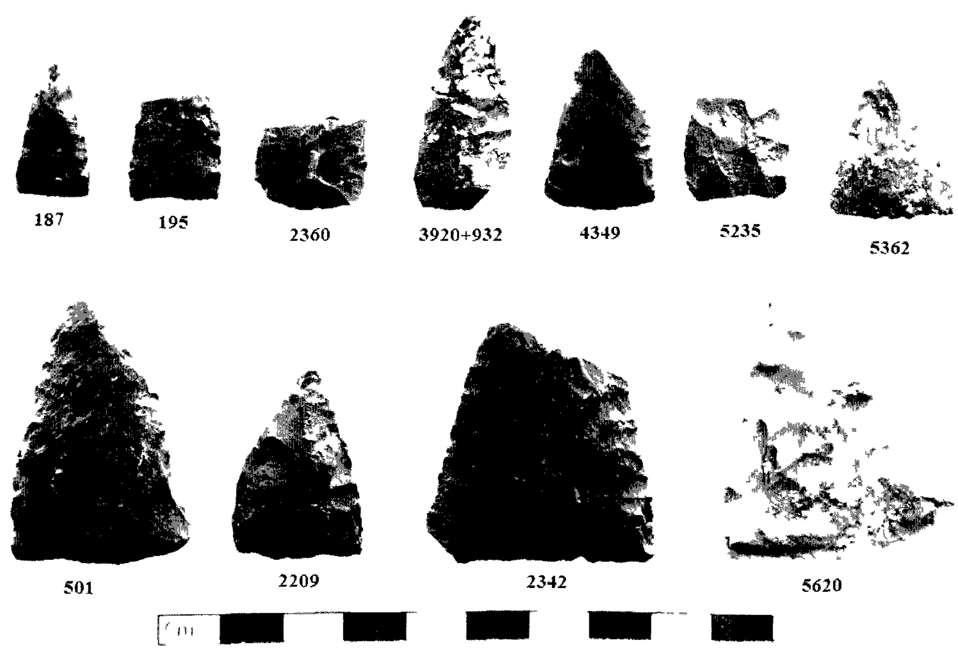

Figure 13: Triangular projectile points

In the Area C section of the site some similar triangular points were noted, but are placed in the miscellaneous point category (Montgomery 1978).

Stemmed Points

	Max	Min	Avg
Length	52	24	41.0
Width	26	17	20.0
Thickness	07	05	05.9
Weight	7.8	2.0	4.98

Material	**Count**
Basaltic	10
Obsidian	0
Chert	2

These points are diagnostic of the Sushwap Horizon, which is dated to 4000-2500 BP. While there is variation within the size on this type, they are defined as having narrow, rounded shoulders over a base with parallel stem edges and a straight to slightly convex basal edge (Rousseau 2008:237). They are placed in the Shuswap Horizon, and they belong to the latter portion of the period, not appearing until approximately 3000 BP (Richards and Rousseau 1987:27). Magne and Matson argue that stemmed points of varying types can be identified throughout the Middle Period, dating from 7000-3500 BP, making them less than ideal as a diagnostic type (2008:279).

Within the Richards and Rousseau (1987:27) typology the Punchaw Lake stemmed points fit the Type 6 and 7 groupings with rounded shoulders of varying size and straight or slightly convex basal edges. Point 2333 (Fig. 14) has been removed from the metrics due to a missing tip. They range from roughly made, without consistent flaking on coarse material, to more detailed flaking on a fine dacite material. Point 4919 (Fig. 14) has a very short blade which may be the result of re-working a broken point while still hafted. The two chert points are of two different varieties of the raw material. Specimen

4604 (Fig. 14) has been heat treated, but likely after discard, as it is brittle and the dorsal blade surface shows a pot-lid scar.

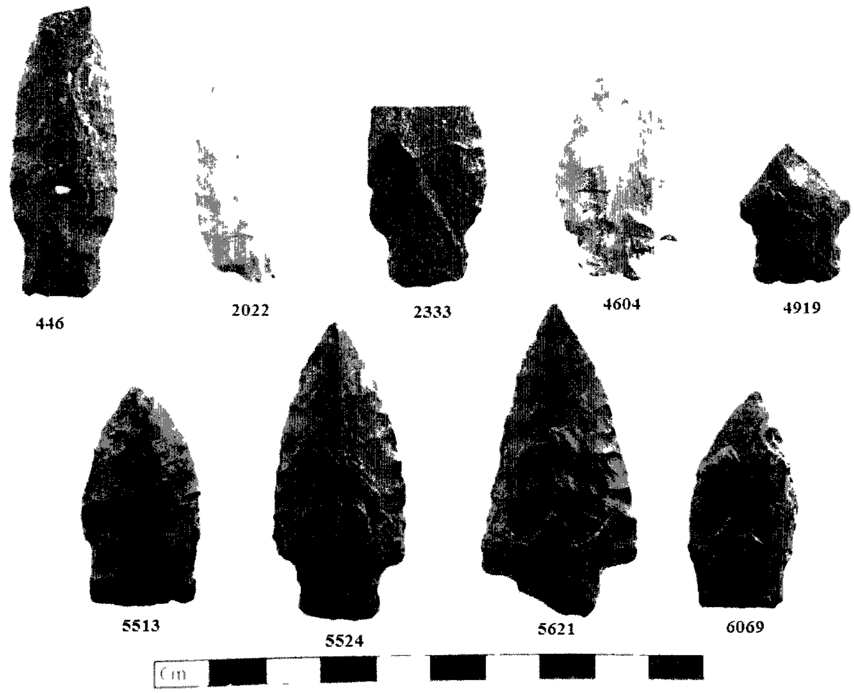

Figure 14: Stemmed projectile points

Three of the stemmed points have some similarities to Kavik points (Fig. 15), which are small points with contracting stems and convex blades edges. They are considered a key indicator of Athapaskan cultural affinity and are often associated with side-notched points, dating from 1200-200 BP (Richards and Rousseau 1987:45), and identified in late pre-Contact or proto-contact period occupations (Borden 1952; Wilmeth 1873). Of these three points, 1297 is most similar to the Kavik point type, but is not distinctive enough to warrant such a classification.

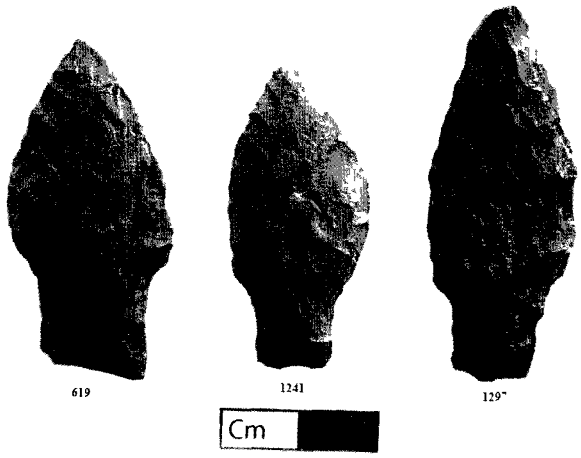

Figure 15: Stemmed Points with slight Kavik similarities

Stemmed points with concave base

	Max	Min	Avg
Length	35	27	31.5
Width	22	18	20.3
Thickness	06	03	04.5
Weight	4.3	2.4	3.53

Material	Count
Basaltic	5
Obsidian	0
Chert	0

These five points represent a variation on the diagnostic stemmed points of the Sushwap Horizon (Fig. 16). This type is defined by markedly rounded shoulders and convex blade edges and slightly expanding base with concave basal edge. The concave basal edge often results in the corners of the base appearing 'eared'. This type compares best with the type 1 and type 8 of Richards and Rousseau's Shuswap Horizon typology, belonging to the earlier part of that Horizon according to Richards and Rousseau, not later than 2800-2500 BP (1987:25).

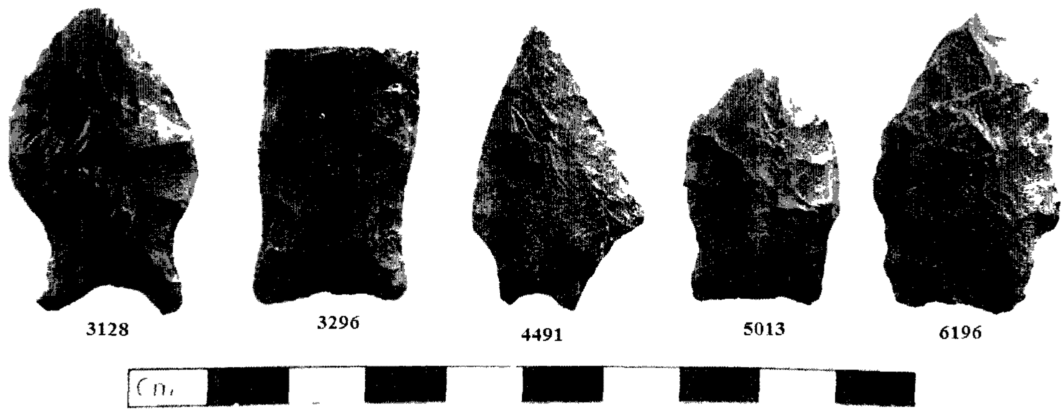

Figure 16: Stemmed points with concave base

Point 3296 (Fig. 16) is incomplete and therefore not included in the metrics. Point 5013 (Fig. 16) is asymmetrical in the transverse cross-section, indicating a re-sharpening event. All of the points of this type were found in House 1, the larger of the two, and none were identified in Area C (Montgomery 1978).

<u>Leaf-shaped/Foliate points</u>

	Max	Min	Avg
Length	92	29	51.0
Width	26	14	20.5
Thickness	11	05	08.0
Weight	33.5	2.9	17.40

Material	Count
Basaltic	3
Obsidian	0
Chert	1

Foliate points have long convex blade edges, with the widest point near the middle of the length. There is no defined hafting modification such as notching or stemming, the base is normally tapered to a point similar to the tip. The leaf shape is common to many contexts. In the Skeena region it is characteristic of the Middle Pre-Contact Period 7000-3500 BP (Magne and Matson 2008:283). Along the coast and in the central interior (including the North Thompson, Lillooet and Lytton localities) large foliate bifaces are known in the Old Cordilleran period of 9000-5500 BP (Fladmark 1982:107; Rousseau 2008:228). Large foliates are defined as having a thickness of 0.5 to 1.0 cm on average, which covers the size of foliates identified in the Punchaw Lake assemblage. They usually interpreted as knife blades, possibly for salmon or large game processing (Rousseau 2008:229).

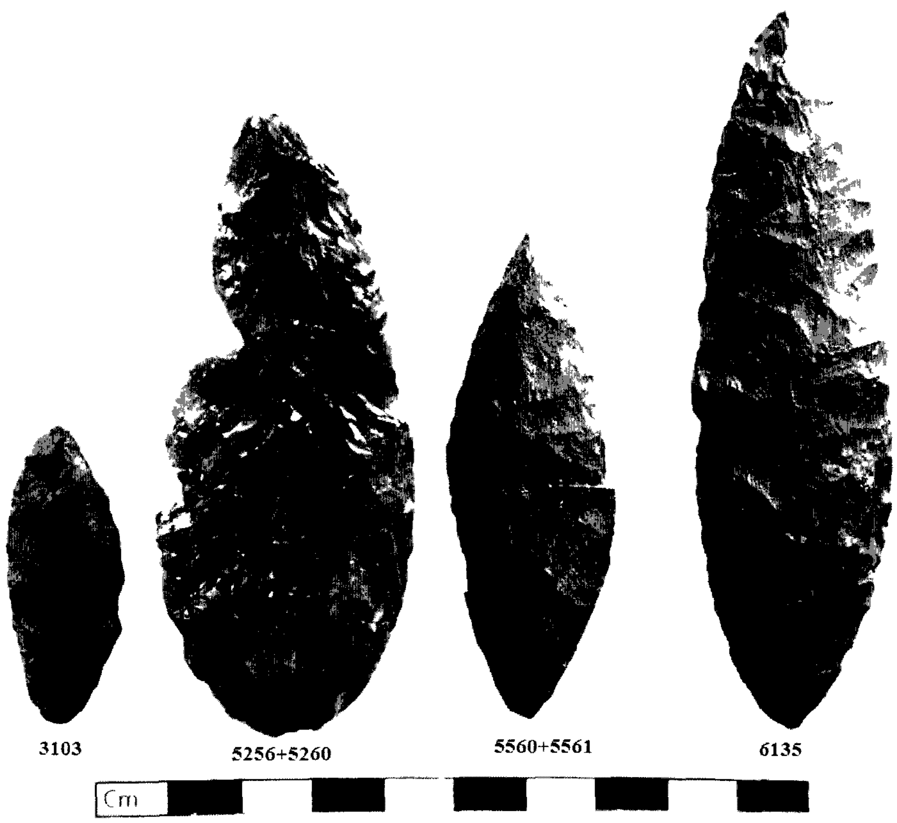

Figure 17: Leaf shaped/foliate points

All of the identified foliates are almost complete examples allowing for accurate measurements. Artifacts 5560 and 5561 (Fig. 17) are two halves that are refitted and 5256 and 5260 (Fig. 17) are also refitted. Three of the foliates are of differing qualities of basaltic material, 5256/5260 is the only one made of a rich reddish chert. Also, artifact

5256/5260 appears to have been modified by heat due to altered sheen and heat fractured appearance, but the modification may have occurred after discard.

J. Morris Boyd identified this point type as a spear point that would have had a long handle. He discussed spears in the context of wars with neighbouring Nations, a weapon of battle and not a hunting implement. (Personal Communication, December 11, 2009).

Lancolate points

	Max	Min	Avg
Length	42	42	42
Width	17	17	17
Thickness	05	05	05
Weight	3.5	3.5	3.5

Material	Count
Basaltic	1
Obsidian	0
Chert	0

Figure 18: Lancolate projectile point, FiRs-1:5741

Lancolate points are defined as being widest at the shoulders, which are high on the body, above the center of the point, closer to the tip than the base (Montgomery

1976:139). There is only one lancolate point within this collection (Fig. 18). The point is made on a fine grained dacite with a base that is narrow and straight. Lancolate points are not very well defined in the literature, variations on the theme are common throughout the pre-Contact period, make them poor diagnostic markers. However, they are more characteristic of earlier periods, generally dating to between 9000-4000 BP in the northwest of North America (Magne and Matson 2008:278-279).

<u>Potentially identifiable point fragments</u>

	Max	Min	Avg
Length	63	10	29 0
Width	37	09	20 8
Thickness	12	03	06 0
Weight	20	0 5	4 83

Material	**Count**
Basaltic	15
Obsidian	2
Chert	3

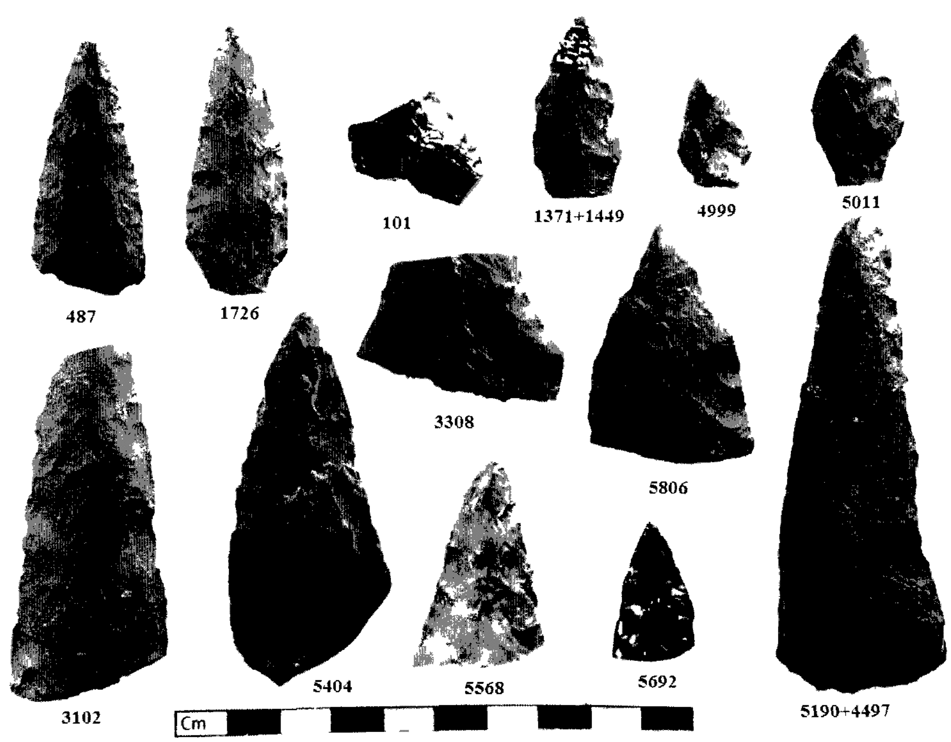

Figure 19: Potentially identifiable point fragments, mid-sections and tips

This category is a catch all for point fragments that have some discernable, diagnostic element, but not sufficient information for a clear classification (Figs. 19 and 20). Specimen 101 conjoins with 5692 (Fig. 19), consisting of the portion of a blade section which may be lancolate or foliate and is also one of the only obsidian points at the site. The second obsidian point fragment is 4999 (Fig. 19) and is most likely a small side-notched Kamloops point, with only a portion of the base missing. A survey of the morphology of these point fragments suggests they could all fit into the types already identified at the site, and therefore they do not add new information to the chronology of the site.

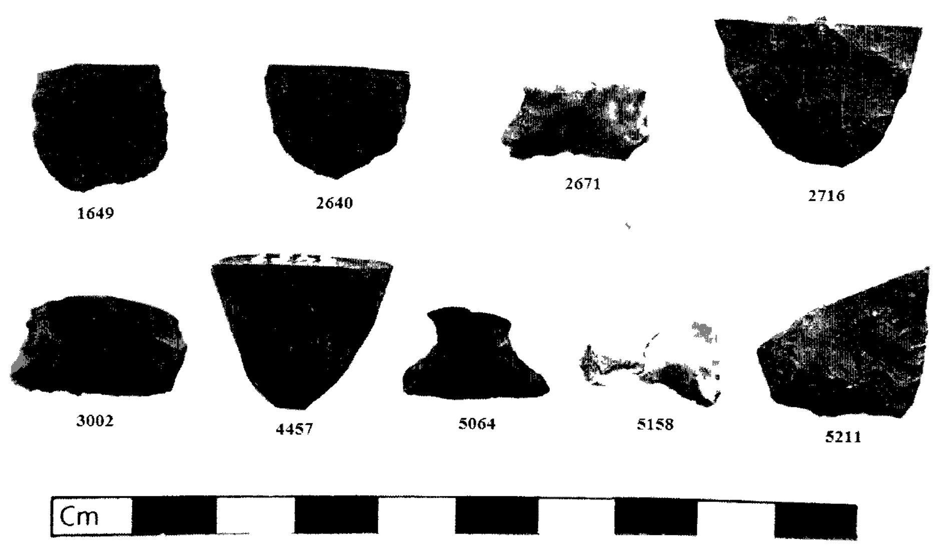

Figure 20: Potentially distinctive point fragments, basal portions

Point tip fragments

	Max	Min	Avg
Length	43	04	22.0
Width	29	09	16.6
Thickness	11	02	05.0
Weight	7.7	0.3	1.73

Material	Count
Basaltic	27
Obsidian	0
Chert	4

This category comprises 31 projectile point fragments that are only portions of the tips and mid-section of points and therefore contain no diagnostic information (Fig. 21). A large group, it makes the total number of points in Areas A and B relatively high, particularly when compared to Area C (Montgomery 1978).

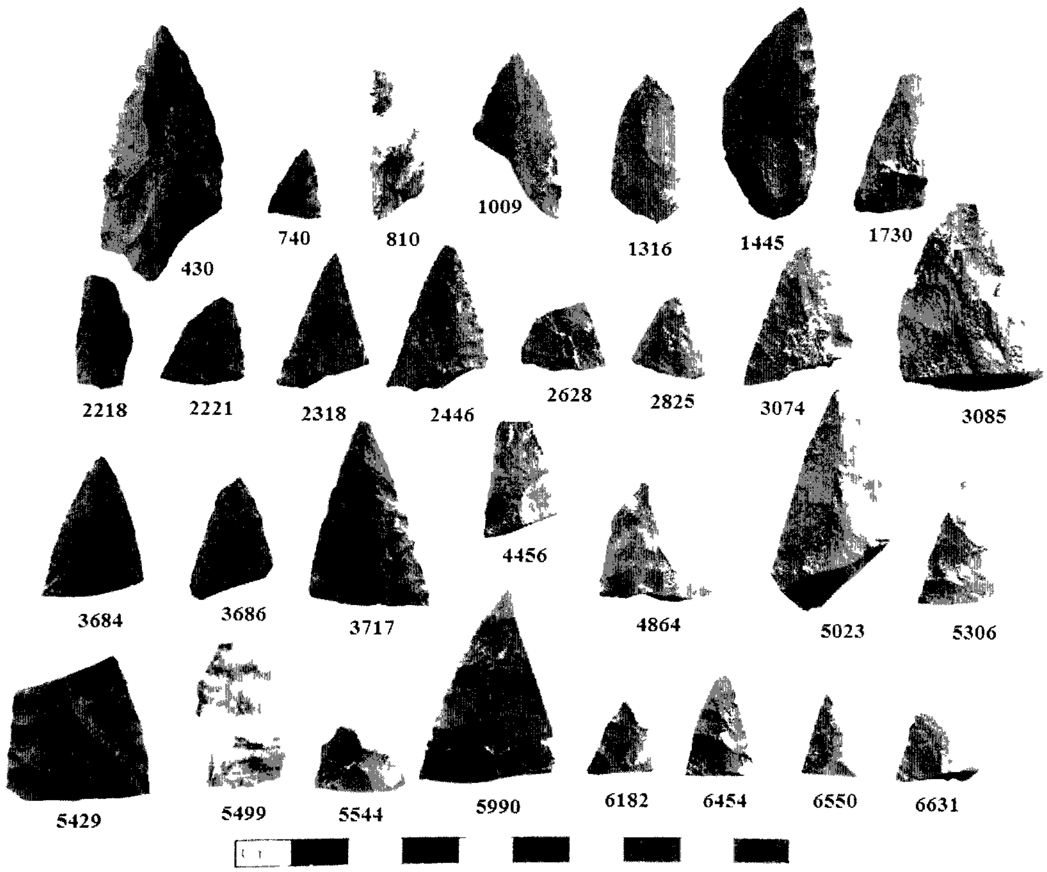

Figure 21: Projectile point fragments, non-distinctive tips

Bifaces

Early Stage

	Max	Min	Avg
Length	72	16	42 6
Width	68	17	33 2
Thickness	23	01	10 9
Weight	61 7	4 2	20 34

Material	Count
Basaltic	31
Obsidian	0
Chert	0

These bifaces appear to be unformed or unfinished, early staged bifaces, with only a few, large flakes removed from both faces along at least one edge, but no thinning flaking or other technique has been used to refine or define the form. Eighteen of these have observed characteristics much like Callahan's Stage 2, or edged biface, but definitive weight to thickness ratios were not used (Callahan 1990). These tools are often

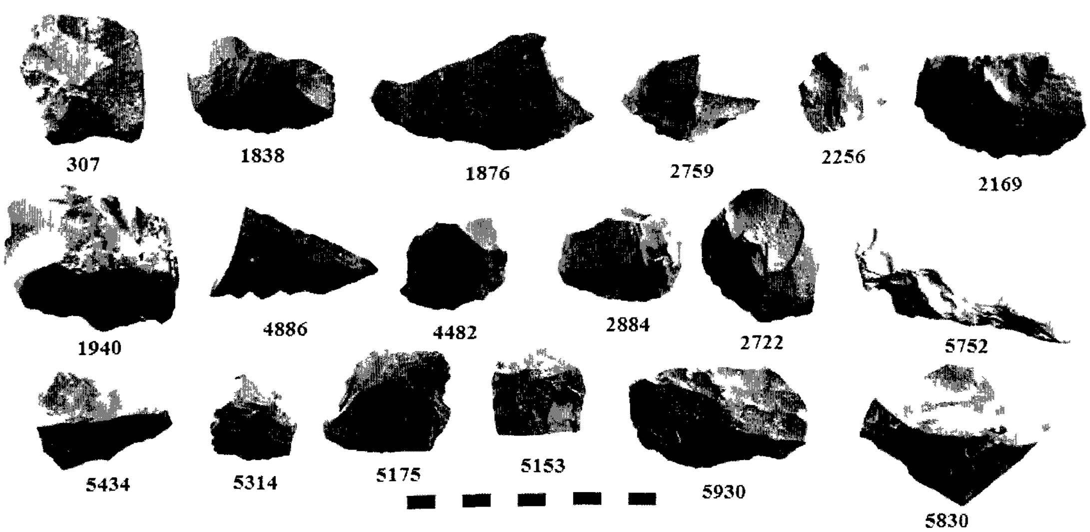

Figure 22: Bifaces resembling Callahan's Stage 2

fragmented or broken, possibly abandoned during the manufacture process due to failure. They may also be exhausted cores, or the product of practicing or learning how to knap. These artifacts are all made on basaltic materials of different qualities (Fig. 22). At least eleven of these are clearly based on reduction of a large primary flake, and twelve present some visible cobble cortex, often at the platform.

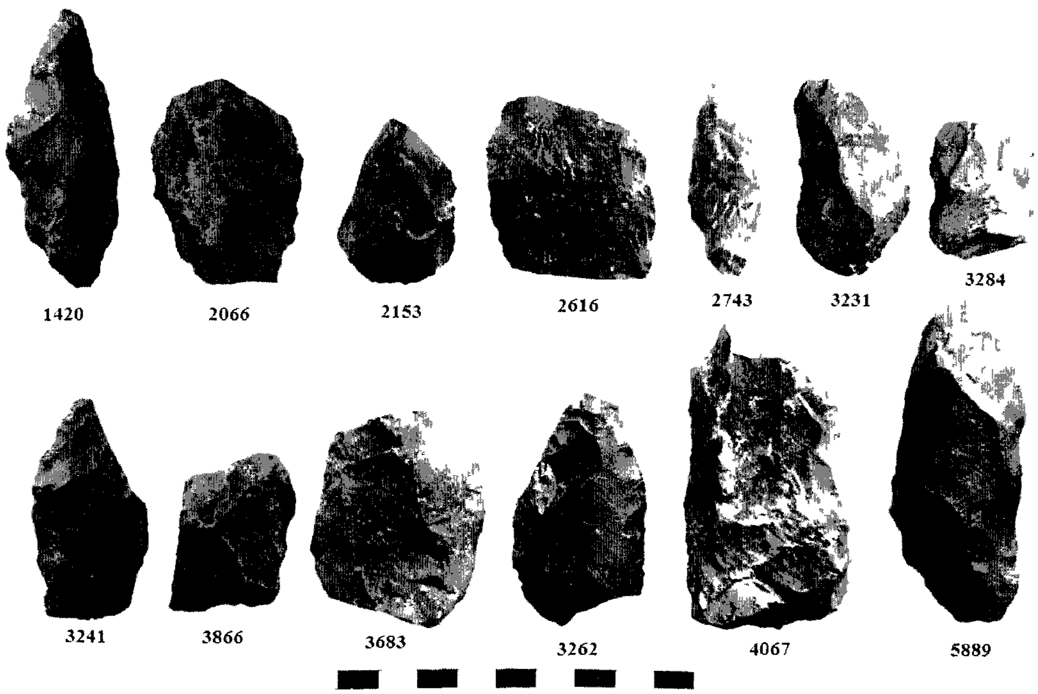

Figure 23: Bifaces resembling Callahan's Stage 3

Thirteen of these bifaces have some evidence of direction towards a sub-rectangular or sub-ovoid type shape, though still appear to be unfinished. These tools stand out for trending towards a sub-ovoid to sub-rectangular form and some finer edge flaking to begin to sharpen or thin the form (Fig. 23). These tools have observed characteristics much like Callahan's Stage 3, or thinned biface (Callahan 1990), but weight to thickness ratios were not used as they are not definitive (Andrefsky 1998).

They are bifacially flaked but without fine finishing or retouch Most appear to have been abandoned due to a critical failure during manufacture or an insurmountable flaw in the material All of these rough forms were made of variable qualities of basaltic material

Early stage biface fragments

	Max	Min	Avg
Length	65	10	31 9
Width	56	07	25 6
Thickness	23	02	9 0
Weight	74 8	0 3	9 52

Material	Count
Basaltic	63
Obsidian	2
Chert	7

This category encompasses fragments with at least one identifiable bifacial edge, with large flakes removed, but with no finer thinning flaking Outside of projectile points, the only other two bifacial items that were made of obsidian are in this category These two items are small and thin, and may have been early stage point preforms Possibly the rare and fragile material was reserved for specific tools, where sharpness was an important design element

Discoid

	Max	Min	Avg
Length	55	29	37 3
Width	43	19	31 0
Thickness	16	07	10 4
Weight	31 2	8	14 63

Material	Count
Basaltic	7
Obsidian	0
Chert	1

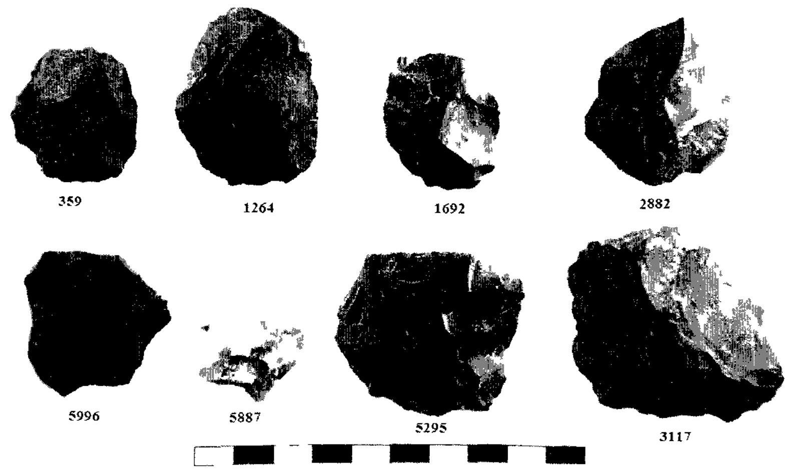

Figure 24: Discoid bifaces

Discoid bifaces are crude, relatively small bifaces with a disc shape which is bifacially reduced all around the edges. Like the early stage bifaces, they may well be exhausted cores or evidence of learning and practicing bifacial reduction techniques. Most of these discoids are of a basaltic materials of different qualities, however 5887 is a pink and white mottled chert with some grey and rust coloured veining (Fig. 24).

Sub-ovoid/Sub-rectangular Bifaces

	Max	Min	Avg
Length	84	31	54.9
Width	41	13	27.7
Thickness	13	02	09.1
Weight	38.3	2.9	18.74

Material	Count
Basaltic	13
Obsidian	0
Chert	2

These morphologically distinct bifaces appear to be completed sub-ovoid to sub-rectangular bifacially reduced tools with more extensive and smaller flake removal patterns that the earlier stage bifaces. This tool type is common and is generally interpreted as projectile point preforms or knives. They may be a multi-functional, portable tool that could have been used as a knife and later reduced to provide expedient flakes and a smaller biface or projectile point as need arose (Kelly 1988). Most of these bifaces are made of finer grained materials relative to the rest of the collection, two are of two different chert types and most of the basaltic examples are on a fine grain material (Fig. 25). A variety of shapes and sizes is also represented, suggesting a variety of uses may have been intended. Five of these have curved profiles and smooth, curved surfaces on one or both faces, suggesting they were made from primary flake blanks.

Doreen Patrick of the Nazko First Nation saw the long, straight edges as useful for scraping the sap and cambium from trees for food, and Dorothy Nome thought the biface would also be used for skinning and butchering of animals (Personal Communication, November 20, 2009). These women saw a multi-purpose tool in the

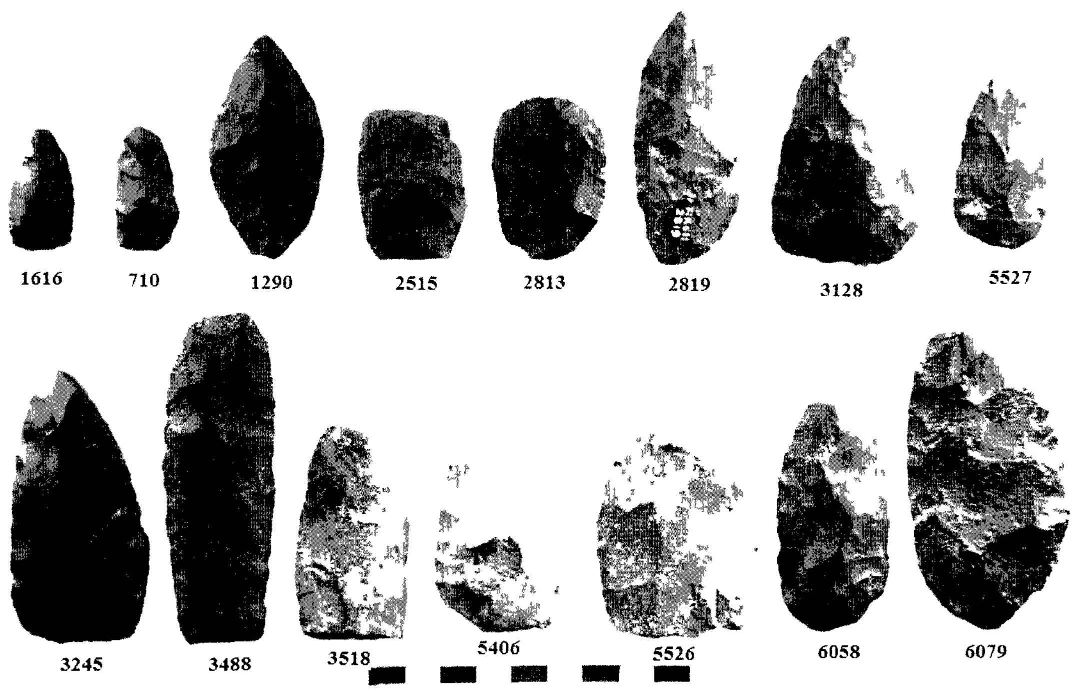

Figure 25: Sub-ovoid and sub-rectangular bifaces

biface. Doreen also indicated that these types of tools appeared to be sharp enough to have been used to remove the hair from a hide in the early stages of hide preparation (Personal Communication, December 11, 2009). J. Morris Boyd said that youth would find these and make a game. The bifaces would be tied to strings and swung in a circle to achieve speed and sent skidding along the snow as fast and far as possible. They would aim the biface projectiles at trees, occasionally striking it hard and direct enough to split the tree (Personal Communication, December 11, 2009).

Sub-ovoid and Sub-rectangular Biface Fragments

	Max	Min	Avg
Length	64	15	31.8
Width	52	07	25.3
Thickness	16	03	07.6
Weight	47.6	0.4	8.51

Material	Count
Basaltic	42
Metamorphic	1
Chert	3

This is large category composed of the fragments of sub-rectangular to sub-ovoid biface tools described above. Bifacially reduced and thinned to refine form for performs or knives. Almost half of these are made of a finer grained basaltic material than the average in the collection.

Backed bifacial edge

	Max	Min	Avg
Length	86	46	62.1
Width	44	31	37.8
Thickness	24	07	13.8
Weight	87.2	21.1	37.55

Material	Count
Basaltic	11
Obsidian	0
Chert	0

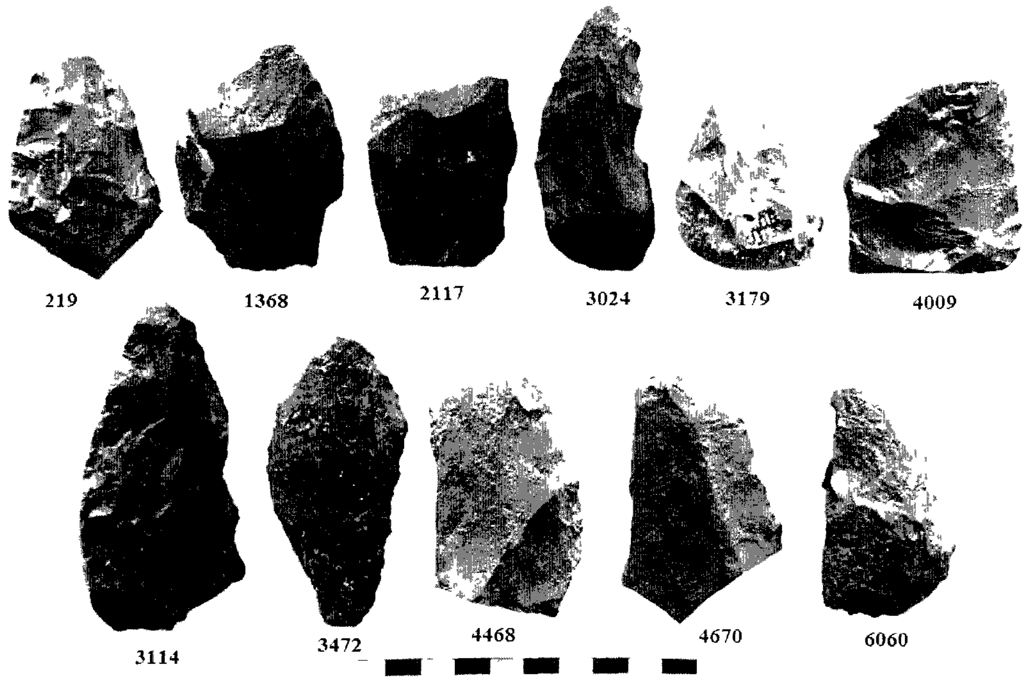

Figure 26: Backed bifacial edges

The eleven backed bifacial edge tools are all made on basaltic material, primarily the coarser material (Fig. 26). They are defined as a single bifacial edge, generally along the length of the tool, with the opposite edge being smooth pebble cortex or a longitudinal break. The form creates an expedient knife or edge tool, with the flat backing protecting the hand during manipulation, eliminating the need for hafting.

Bifacial and bimarginal sub-triangular

	Max	Min	Avg.
Length	4.6	1.4	3.06
Width	5.4	1.5	2.83
Thickness	0.8	0.2	0.50
Weight	13.1	0.5	5.41

Material	Count
Basaltic	10
Obsidian	0
Chert	0

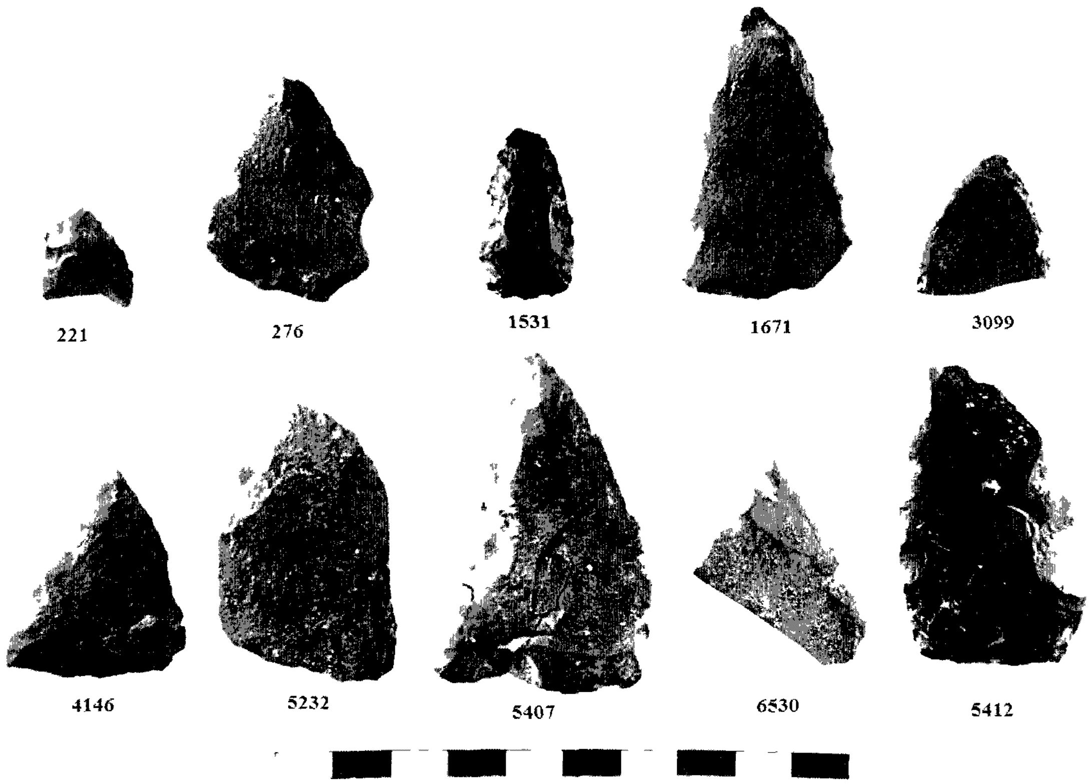

Figure 27: Bifacial and bimarginal, sub-triangular

These are small flake based tools that are bifacially reduced to thin, generally triangular forms. All three margins show some evidence of further bimarginal retouching, however the tip is not sharpened to a point and there is no hafting element, suggesting that the tool is not a projectile point or preform. This form appears to be an expedient tool, made on flakes at hand, generally of coarser grained materials, although 221, 1531 and 5412 (Fig. 27) are all of a finer grained dacite material.

Pointed bifaces

	Max	Min	Avg
Length	59	36	47.5
Width	50	34	42.0
Thickness	14	08	11.0
Weight	36.3	8.2	18.00

Material	Count
Basaltic	2
Obsidian	0
Chert	1

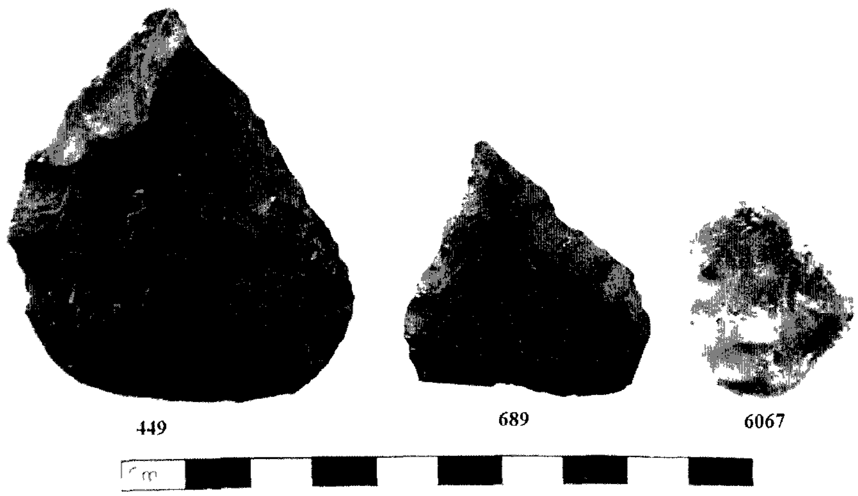

Figure 28: Pointed bifaces

Possibly gravers, these are large bifacial tools with a distinct morphology of a broad, rounded base and a refined pointed tip. The width and thickness, along with the lack of hafting element suggest that these are not projectile points, but may have been utilized as a graver or large awl. All three are made on coarse grained material, two of coarse basaltic material and the third of a coarse, opaque chert (Fig. 28).

Drills

	Max	Min	Avg
Length	45	17	31.0
Width	18	07	12.2
Thickness	06	03	04.4
Weight	2.4	0.4	1.68

Material	Count
Basaltic	1
Metamorphic	0
Chert	4

Drills are bifacially reduced tools, with a distinct morphology of a pointed projection and a base hafting element, much like a projectile point. A key feature is the projection that is normally narrow and dull. These tools are reworked as they dull or as tips break off, which can be seen by a twisting in the profile of the drill bit and they appear to have been re-worked while still hafted as the haft element on short bits appears

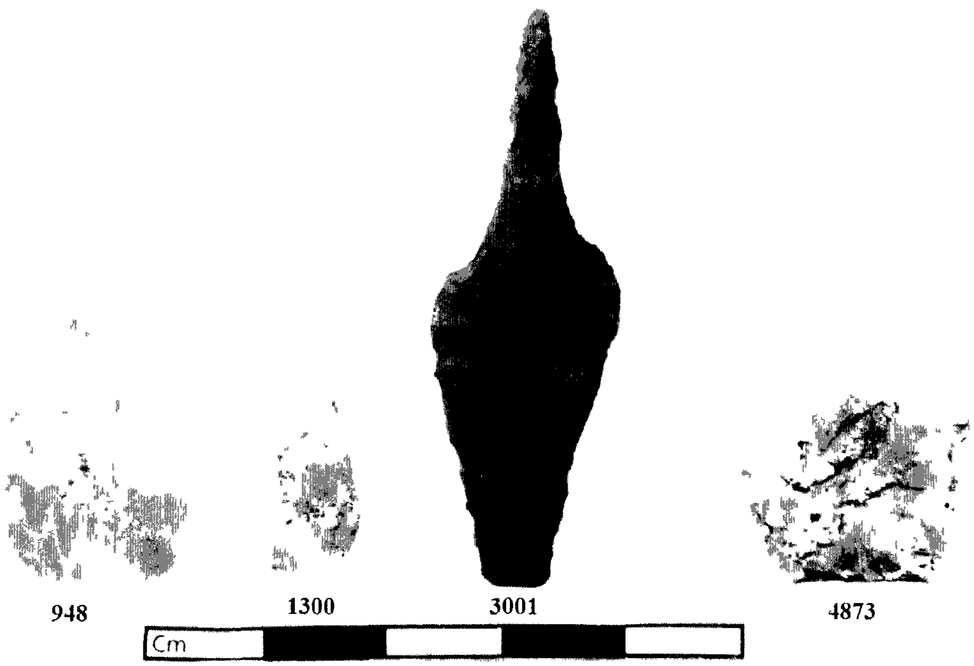

Figure 29: Drills

to be disproportionately large. Number 4873 (Fig. 29) seems to be an exhausted tool, as it shows evidence of repeated reworking until the bit is quite short. Drill 3001 (Fig. 29) also displays evidence of reworking along the bit . All of these drill bits are made on fine grained and strong materials, primarily chert, but also dacite, which is too be expected from a clearly curated tool type.

Dorothy Nome, of the Nazko First Nation, said the drill reminded her of the ornament her grandmother wore in a piercing in her nose (Personal Communication, November 20, 2009).

Hand-axe

	Max	Min	Avg
Length	139	117	128.7
Width	81	69	73.3
Thickness	31	15	24.0
Weight	352.2	147	269.73

Material	Count
Basaltic	2
Quartzite	0
Argilite	2
Metamorphic	0

Hand-axes are bifacially flaked cobble tools that are thick and coarsely made from river cobbles. They may have been had held chopping tools, but may also have been hafted as an axe. They are made from coarse, resilient materials so the worked edges are not very sharp, but will withstand extensive use (Figs. 30 and 31).

Figure 30: Hand-axes

Artifact FiRs-1:3656 (Fig. 31) stands out from the other hand-axes as a large, teardrop shaped tool made on coarse grained basaltic material. A distinct combination tool with the thick, rounded, wide end, it is roughly bifacial, much like a hand axe or chopper. Also, one of the long edges is unifacially worked, while the opposing edge is flat cobble cortex creating a backed unifacial blade. This appears to be a multi purpose tool that would have been useful for several jobs, suggesting a curated tool type. However, it is coarsely flaked and would not have required much time to manufacture, assuming a large enough piece of raw material was available, which suggests a more expedient tool.

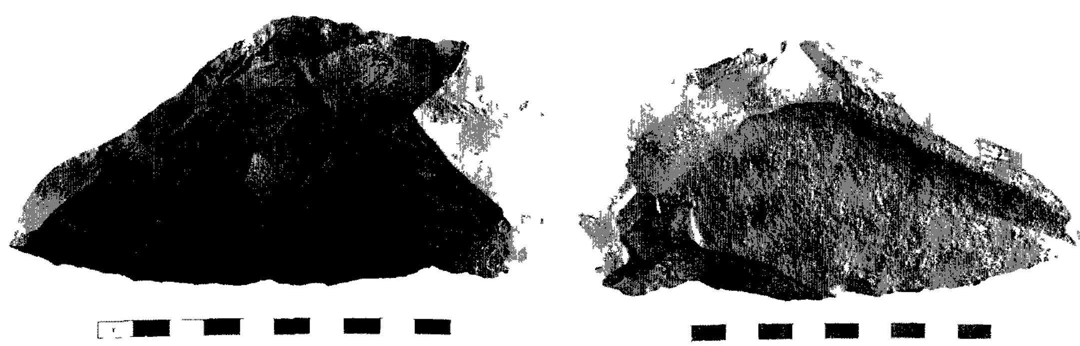

Figure 31: Two faces of the hand-axe with backed unifacial edge, FiRs-1:3656

Doreen Patrick, Dorothy Nome and Lucy Laurent of the Nazko First Nation saw the rounded, bifacial end of the tool as appropriate for scraping hide to soften and dry it. Dorothy indicated a long, top to bottom stoke with the rounded end of the tool, for softening moose hides (Personal Communication, November 20, 2009). J. Morris Boyd, also of the Nazko First Nation, suggested that such large, rough tools would have been used as a hammer and an axe by hafting to a long wooden handle (Personal Communication, December 11, 2009).

Miscellaneous Biface

	Max	Min	Avg
Length	78	78	78.0
Width	60	60	60.0
Thickness	12	12	12.0
Weight	46.6	46.6	46.60

Material	Count
Basaltic	1
Obsidian	0
Chert	0

This one bifacial tool does not fit into any of the other categories and has a distinctive morphology that sets it apart. This tool, 442 (Fig. 32), is a large well made knife type tool with the longest edge formed concave, the opposite edge convex and the shorter edge straight. The transverse cross section is plano-convex, which along with a flat surface on one face, suggests the tool was made on a large primary flake blank. Polish on the higher portions of the faces indicate the tool was likely hand-held during use, which would allow all three of the edges to be used during a task. This tool is made on a fine grained basaltic material that is quite robust. The variety of edge shapes and angles suggest a variety of tasks could have been performed with this unique tool.

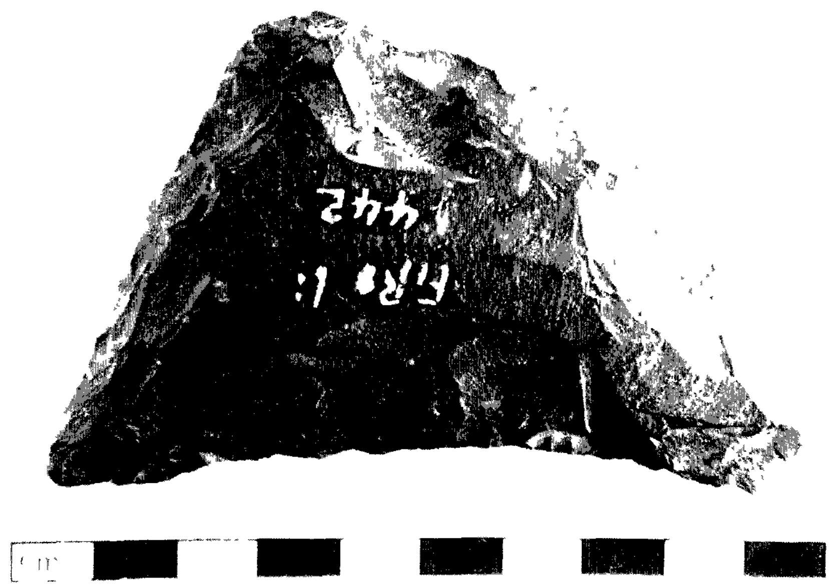

Figure 32: Miscellaneous biface FiRs-1:442

Bıfacıal Reductıon Flakes

	Max	Min	Avg
Length	83	13	35 8
Wıdth	52	10	30 6
Thickness	17	01	08 3
Weıght	75 2	0 3	11 65

Material	Count
Basaltıc	32
Argıllıte	1
Chert	2
Metamorphıc	1

These are flakes that have a sınuous, knapped edge, ındıcatıve of a bıfacıal reductıon pattern (Crabtree 1999 57), along one edge but no other dıstınctıve attrıbutes They are better defined as a debıtage category, but have been ıncluded here as refectıve of the amount of bıfacıal reductıon that was occurrıng on the sıte Fıve of the flakes appear to be early, abandoned prımary flakes, as they are all relatıvely large wıth extensıve cortex These by-products from early stage forms are sıgnıficant as the rounded cortex edges ındıcate that these raw materıals are beıng brought to the sıte as rıver cobbles and worked on the locatıon The remaınıng thırty-one of these flakes are smaller and have the sınuous knapped edge as the platform of the flake, ındıcatıng secondary removal of the flake ın the bıface reductıon pattern (Andrefsky 1998 159) Thıs provıdes clear evıdence of most, ıf not all of the stages of the bıfacıal reductıon process were takıng place on sıte, wıthın the houses

Unifacial Tools

Unıface, mıscellaneous form

	Max	Min	Avg
Length	83	14	37 5
Width	59	14	31 0
Thickness	18	02	8 9
Weight	103 2	1 4	14 5

Material	Count
Basaltıc	56
Chert	2
Metamorphıc	1

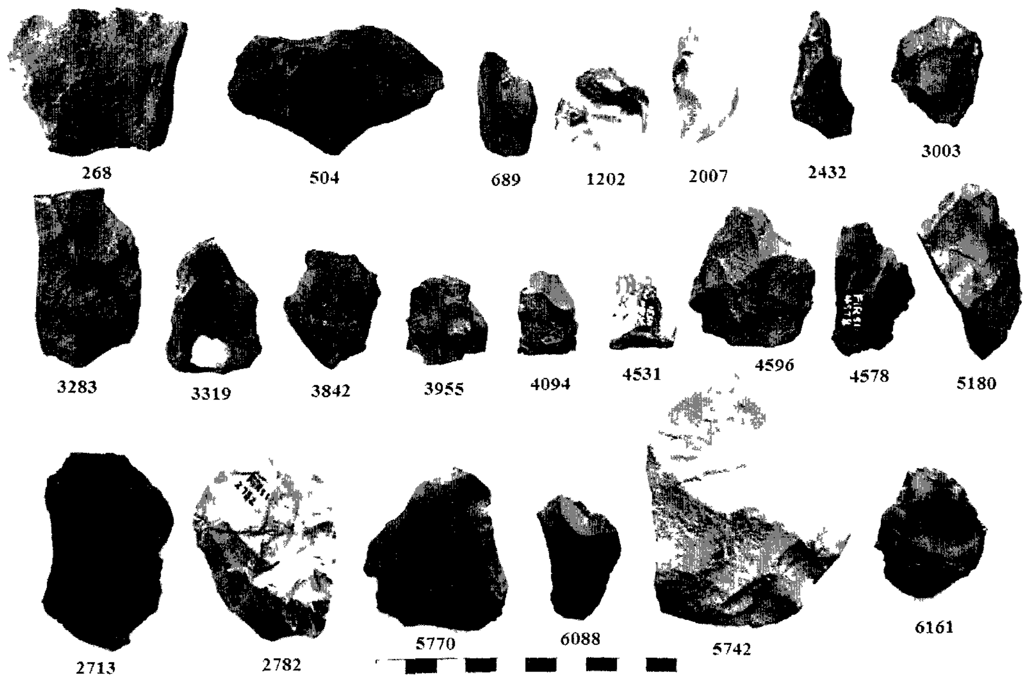

Figure 33: Rough unifaces

These are flake based tools that have some a small amount of flake reduction or working on one face, but no other worked edges or shaping (Fig. 33 and 34). There is very little work done with these pieces and they may be abandoned and discarded preforms, but may also be expedient tools. Most of these are made of basaltic materials of varying qualities, and cobble cortex is present on many of these pieces. Seven of these tools, with cobble cortex, appear to be made from primary or large secondary flakes. Most of these tools appear to be expedient and random shapes based on the shape of the flake blank with extensive, regular working on at least one edge. Like the sub-ovoid unifaces, the purpose of these tools is not clear as edge angle is not steep, nor are the edges particularly sharp.

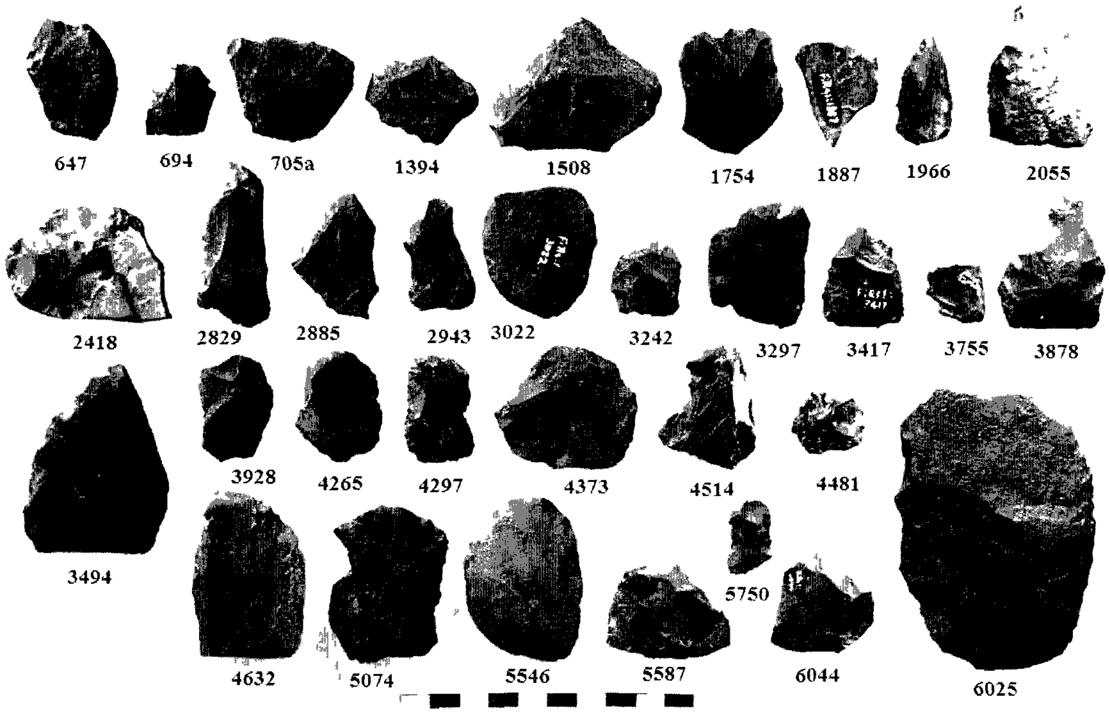

Figure 34: Unifaces of miscellaneous forms

<u>Fragments of unifaces</u>

	Max	Min	Avg
Length	47	09	27.7
Width	60	10	24.7
Thickness	20	02	07.9
Weight	13.3	0.4	5.54

Material	Count
Basaltic	41
Obsidian	0
Chert	8
Metamorphic	0

These are fragments of unifaces that are too incomplete to identify any distinct morphology, and appear to be related to the miscellaneous unifaces discussed in the previous category. They are not of the more extensively flaked sub-ovoid type.

Backed unifacial edges

	Max	Min	Avg
Length	93	40	65.0
Width	42	22	32 6
Thickness	22	09	13.2
Weight	51.1	11	31.62

Material	**Count**
Basaltic	5
Obsidian	0
Chert	0

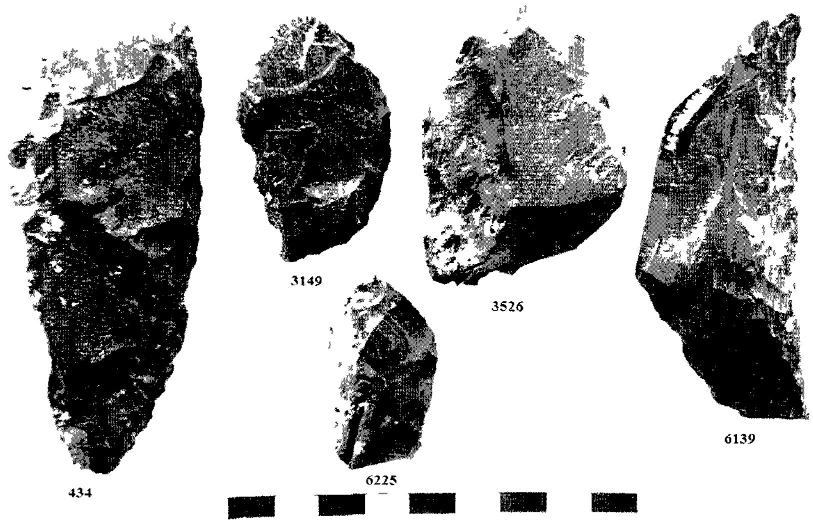

Figure 35: Backed unifacial edge

These are defined by a primary, unifacially flaked edge with the opposing edge being either flat cobble cortex or flattened by longitudinal fracture. This flat backed edge allows manipulation of the tool without hafting, much like the similar bifacial backed edge tool (Fig. 35).

Backed uniface edge fragments

	Max	Min	Avg
Length	75	20	50.7
Width	57	27	43.6
Thickness	21	06	11.4
Weight	61.5	11.6	33.66

Material	**Count**
Basaltic	7
Obsidian	0
Chert	0

These tools appear to be fragments of those with one unifacially worked edge and a flat opposing edge of cortex or longitudinally snapped (Fig. 35). These forms are roughly made on coarse grained materials, and as such appear to be expedient in nature.

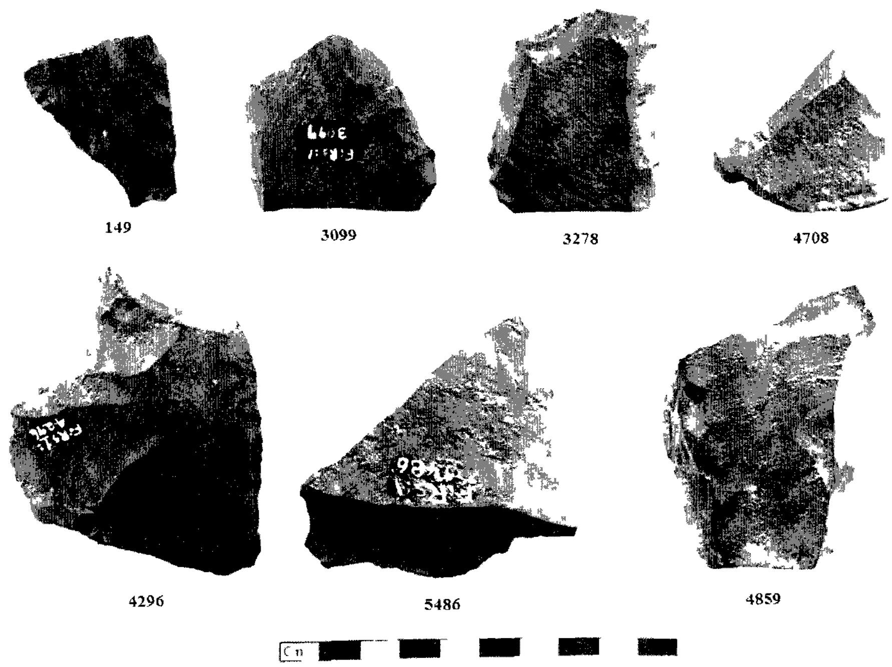

Figure 36: Backed uniface edge fragments

<u>Unifaces – Sub-ovoid</u>

	Max	Min	Avg
Length	89	21	44 0
Width	45	10	23 4
Thickness	13	02	05 6
Weight	54 8	0 8	11 27

Material	Count
Basaltic	6
Obsidian	0
Chert	1

There are seven complete, unifacially reduced flake based tools, with sub-ovoid to foliate forms (Fig. 37). Flake removal covers the entire dorsal surface of the tool to create the form. The function of these tools is difficult to decipher as the edge angle is generally not steep enough for scraping, while the edges are not sharp enough to be a cutting or chopping tool. Some may be scraper preforms. These tools have been separated from the rough unifaces as they are the product of much more work, and tend to have a specific form that suggests specific design decisions were being made by the craftsperson, perhaps with specific tasks in mind.

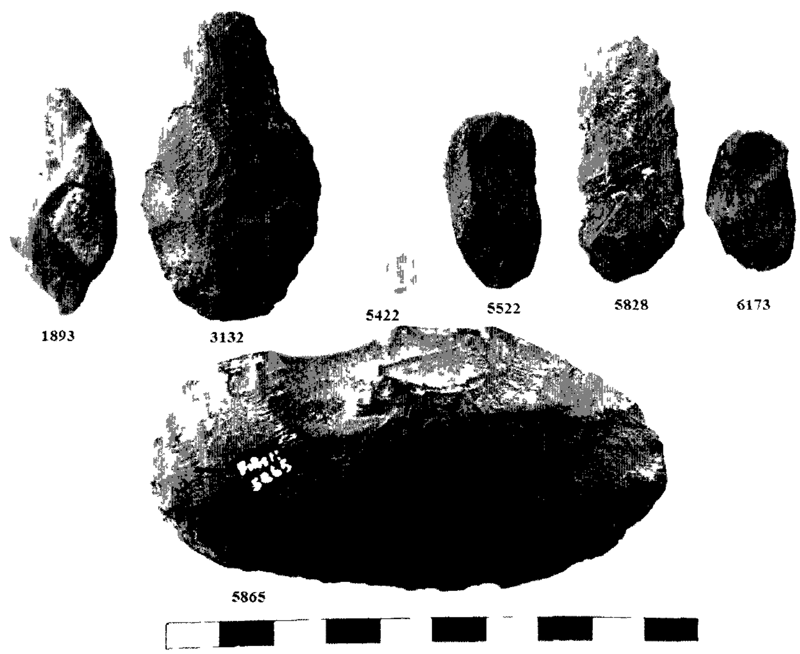

Figure 37: Sub-ovoid unifaces

Sub-ovoid uniface fragments

	Max	Min	Avg
Length	58	21	38.5
Width	50	16	31.1
Thickness	17	03	08.9
Weight	38.2	1.3	14 49

Material	Count
Basaltic	12
Obsidian	0
Chert	1

These fragments of unifacial tools based on flake blanks with extensive unifacial reduction to form a sub-ovoid to sub-rectangular shape (Fig. 38). These pieces, if complete, would have fit within the sub-ovoid uniface category. Most appear to have been discarded after manufacture and possibly broke during use, they do not appear to be abandoned mid-stage tools; unless the supposition that the complete forms are performs is true, in which case these may have broken during further manufacture.

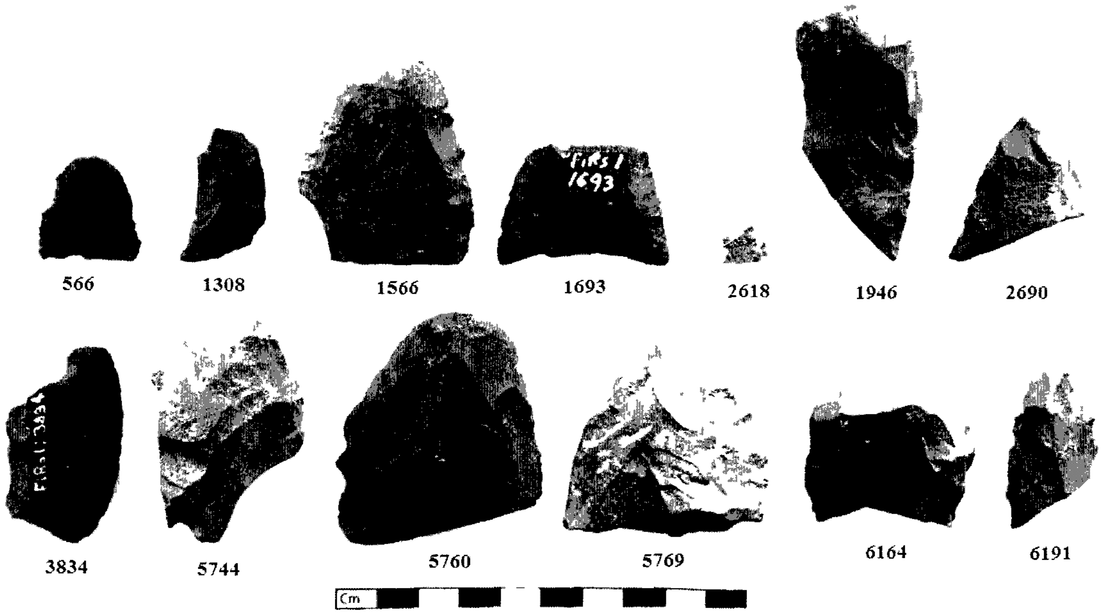

Figure 38: Sub-ovoid uniface fragments

<u>Key shaped uniface</u>

	Max	Min	Avg
Length	51	17	31.5
Width	31	11	20.2
Thickness	08	02	04.8
Weight	8.7	0.7	3.07

Material	Count
Basaltic	2
Obsidian	0
Chert	15

This is a distinct form of uniface with extensive unimarginally shape edges. These tools are possibly based on blade-type blanks, or similar thin, flat secondary thinning flakes, as they are wider that normal blades. The distal projection has a concave

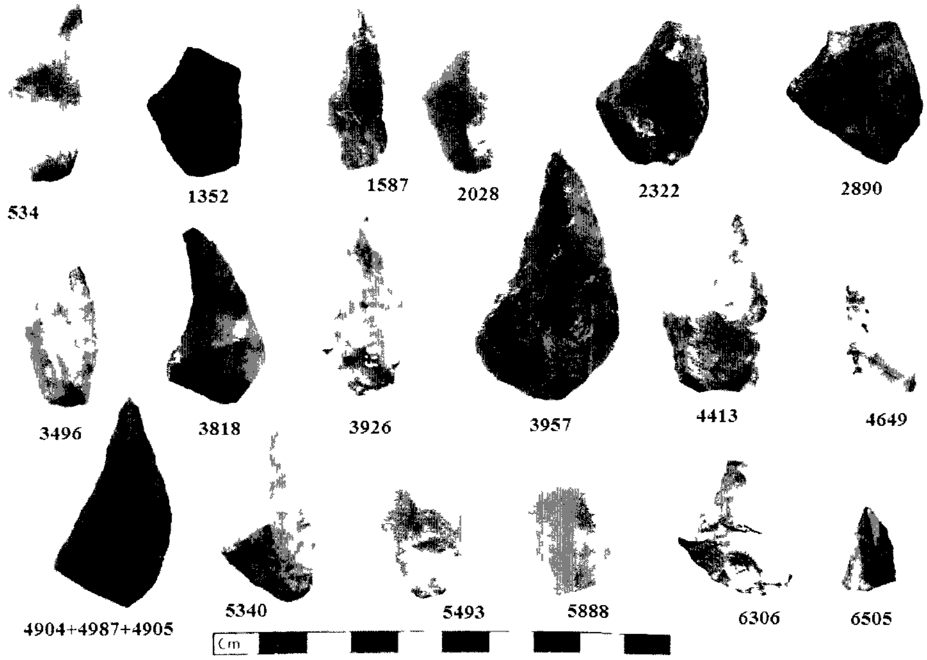

Figure 39: Key-shaped unifaces

margin and the opposite margin is straight. The base in straight and was typically hafted. Extensive research has been conducted on this tool type that suggests it was used for various functions in the harvesting and processing of wood products, and dates to between 3000-1000 BP on the central plateau (Rousseau 1992). Rousseau's (1992) analysis also suggests that the tool was specialized and consumed higher than average amounts of time, energy, and high quality material resources to produce, therefore was a curated tool type. They are made almost exclusively on chert type materials.

The 18 tools of this type identified at FiRs-1 seem to uphold this interpretation, with the larger majority being made of varied types of chert (Fig. 39). One of the two basaltic pieces, 1357 (Fig. 39), is of a very fine material, while piece 4904 (Fig. 39) is the only one made of a coarser grained material.

Notch

	Max	Min	Avg
Length	40	17	27 9
Width	44	20	31.9
Thickness	14	02	06 1
Weight	17.4	1	5 54

Material	Count
Basaltic	6
Obsidian	0
Chert	1

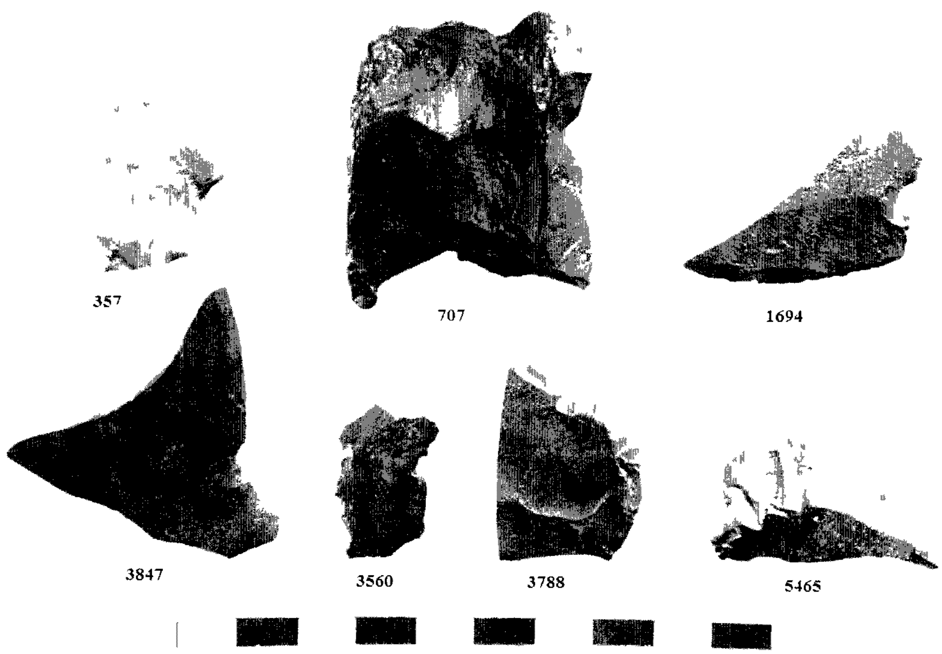

Figure 40: Notches

This is an expedient tool form that is unimarginally retouched and has an intentional small notch along the retouched edge. Notches of this type may have been spokeshaves or shaft scrapers. These tools are made on flake blanks of a variety of qualities of material and sizes, suggesting they are made with whatever appropriately sized debitage is on hand (Fig. 40).

Unifacial graver

	Max	Min	Avg
Length	51	15	32 3
Width	44	10	28.2
Thickness	16	03	06.5
Weight	11.9	0.2	5.55

Material	Count
Basaltic	19
Obsidian	0
Chert	3

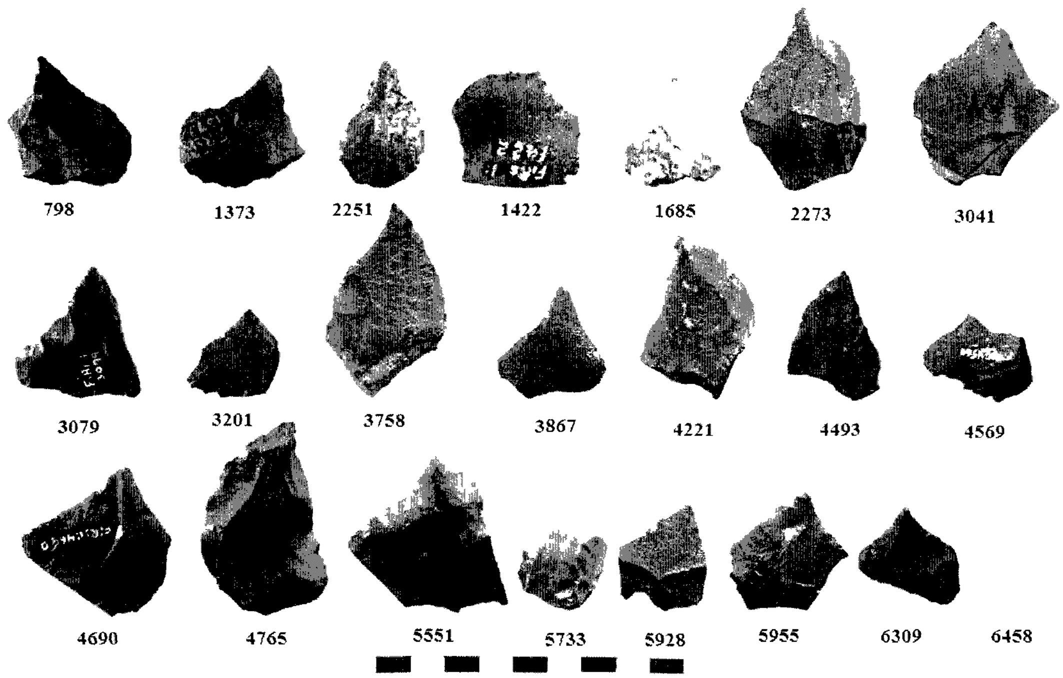

Figure 41: Unifacial graver

There are 22 of these rough, flake based tools, unifacially and unimarginally worked to create a short, pointed projection (Fig. 41). The points have a slight curve to them, possibly to improve angle for weight and pressing on the tip. One of the worked edges is therefore typically convex. They are too small and fragile to have been used as awls on most leathers. The term graver is used here to differentiate these from other pointed tools types and to suggest a possible use, although the purpose of these tools is unknown. They seem to be expedient, based on the minimal amount of flaking executed to shape the form. The variety of flake shapes and materials also suggest they were made from what material was near at hand.

Dorothy Nome thought these tools may have been useful to score and cut hide to make moccasins and other items, but was not positive of their intended use (Personal Communication, November 20, 2009).

Concave edge scraper

	Max	Min	Avg
Length	50	23	36.1
Width	49	11	24.5
Thickness	14	03	07.3
Weight	13.2	1.3	5.60

Material	Count
Basaltic	6
Obsidian	1
Chert	1

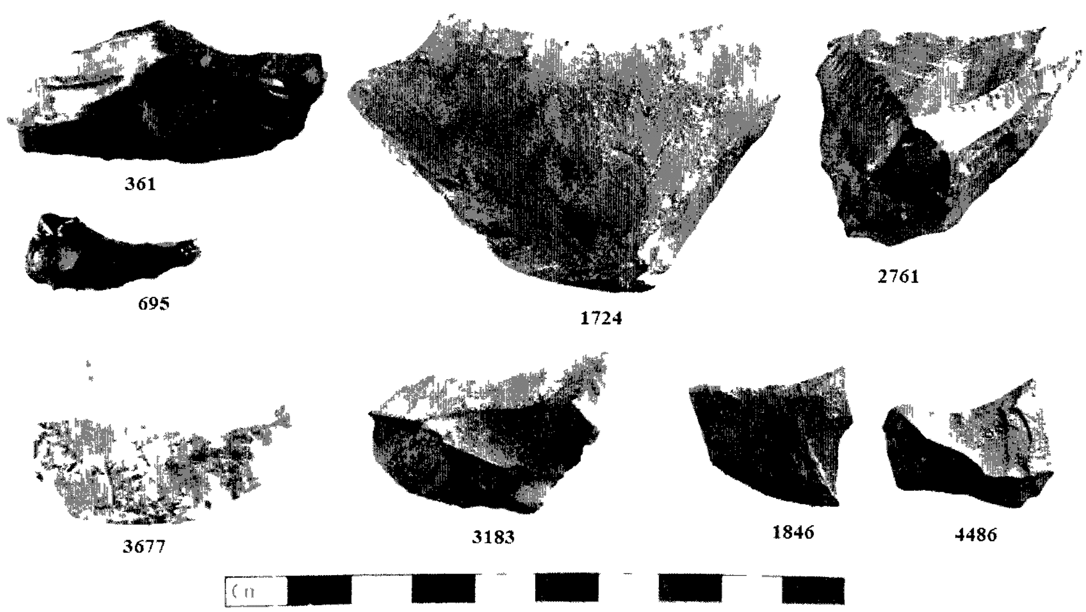

Figure 42: Concave edge scrapers

The concave edge scraper is a scraper type that is defined as having a steep edge angle all along one primary use concave edge. They are extensively unimarginally retouched to create the steep, scraper edge. However, the concave edge shape is not known to be used for scraping hide. Further, it is unusual that one of these scrapers is made of obsidian, artifact 695 (Fig. 42), as the sharp and fragile material is not ideal for scraping hides, raising the question of intended use. Perhaps they are a larger sized notch, also used as a sort of spokeshave and intended to debark or refine the shape of larger sticks and poles, which may have been used as weapon or tools shafts, or in house construction.

End scrapers

	Max	Min	Avg
Length	100	21	35.4
Width	51	05	26.7
Thickness	17	04	10.1
Weight	79.5	2	12.64

Material	Count
Basaltıc	21
Obsidian	2
Chert	9

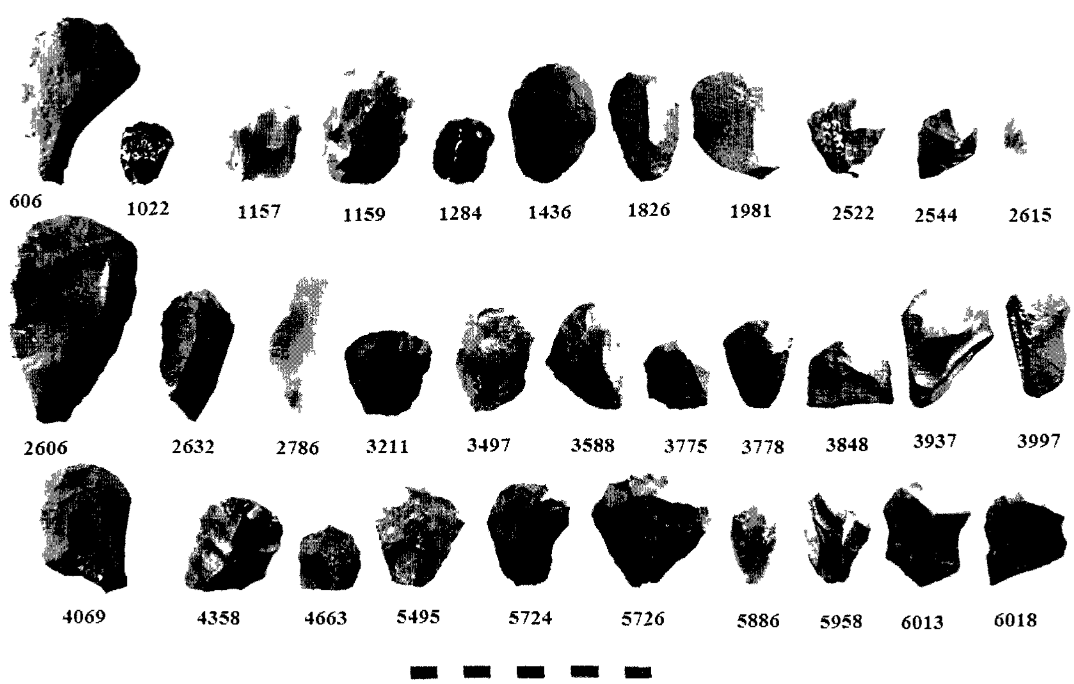

Figure 43: End scrapers

Often referred to as thumbnail scrapers, these tools are oblong or tear shaped, with the wide end edge being the thickest and being retouched to a rounded, steep edge angle. These scrapers are commonly retouched to an edge angle up to 90 degrees or even greater, possibly as a result of use and rejuvenation. Modification of the 'tail', or narrow end of the tool, may be to facilitate hafting.

A wide variety of raw materials and tool sizes are represented in this group, likely because, while a very intentional tool form, it can be easily made on whatever material is at hand (Fig. 43). End scrapers can be considered an expedient tool as they can be quickly made on any flake blank with a sufficient thickness. Two of these scrapers, numbers 3497 and 6013 (Fig. 43), are considered spurred or eared end-scrapers, which some considered a separate type (Wilmeth 1978:105-107). They may be intentionally designed to have spurred corners or it may be the result of rejuvenating the tool while it is hafted, due to this ambiguity regarding the intentionality of the form they are not separated in this classification. In this collection there is a continuum of shapes from fully round corners, through squared off corners to distinct spurs, therefore it is logical to not create separate categories.

Dorothy Nome recognized a large end scraper as something she had seen made and used in the past. She noted that they would have been on a long stick handle, hafted by wrapping around it, and she indicated a strong, horizontal scraping motion, with a lot of pressure behind it (Personal Communication, November 20, 2009).

Convex Edge scraper

	Max	Min	Avg
Length	52	16	27 9
Width	47	07	25 8
Thickness	15	01	05 8
Weight	28 3	1 2	6 47

Material	Count
Basaltic	28
Obsidian	0
Chert	4

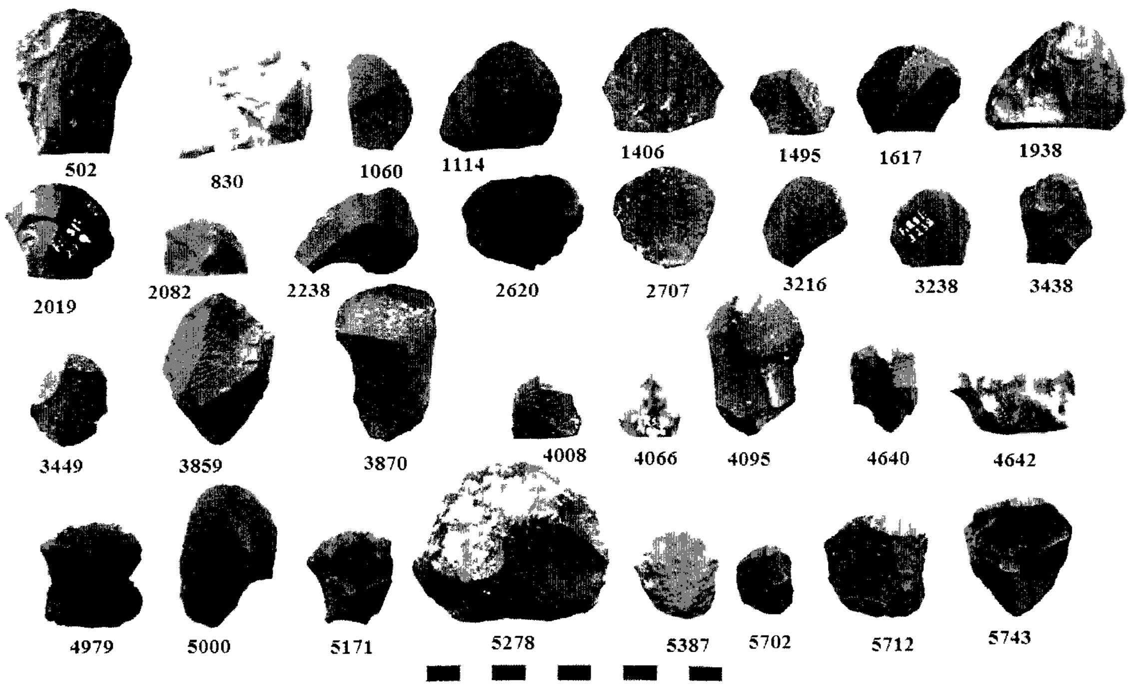

Figure 44: Convex edge scrapers

These scrapers are distinct from end 'thumbnail' scrapers as they are slightly thinner on average, not tear-drop in shape and the retouch is less dramatic, creating working edge that is less steep. The primary worked edge is convex, with the retouch sometimes extending further along an adjacent edge(s). Again, a wide variety of material qualities are represented in this category (Fig. 44). These small, expedient tools, with minimal restrictions of form, could be made from debitage on site.

Circular scraper

	Max	Min	Avg
Length	39	23	31 7
Width	37	27	33 0
Thickness	15	06	08 8
Weight	24 6	5 6	12 43

Material	Count
Basaltic	5
Obsidian	0
Chert	1

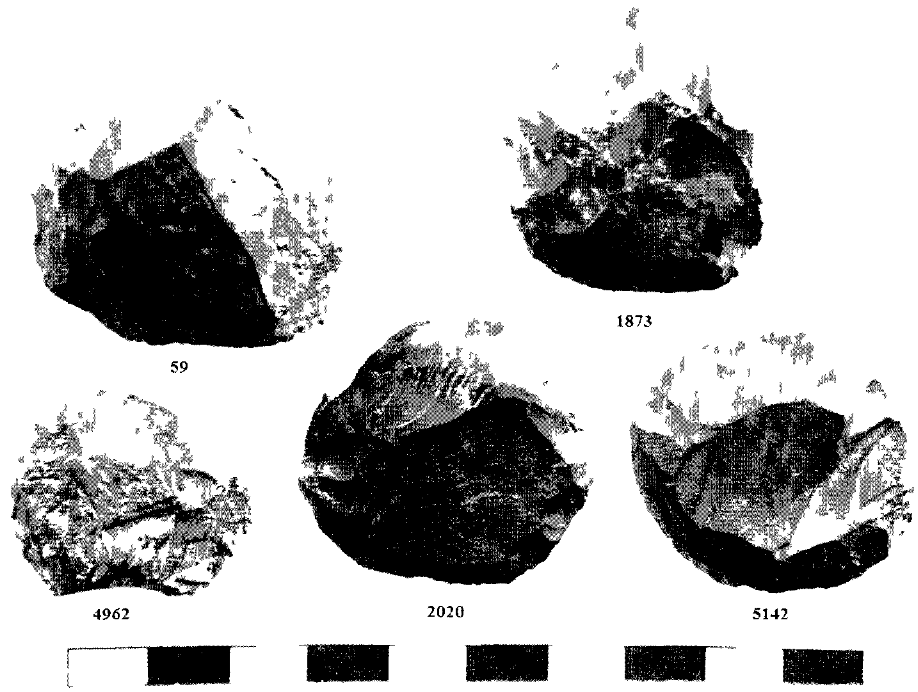

Figure 45: Circular scrapers

These scrapers are unifacially and unimarginally worked on all edges to create a roughly circular, almost dome shaped scraper with a steep edge angle on all sides. A bit of cortex on 2020 and flat surfaces on three of the tools suggest they are made on large primary flake blanks (Fig. 45). Flakes utilized as the basis for this tool type may have had to be intentionally removed from the core for this purpose in order to ensure thickness. The intended use of such a tool is unknown, but the steep, convex scraper edges a similar to other hide working tools. Perhaps this version was hand-held and used without a haft element, and is therefore sized to fit in the hand.

<u>Awl with endscraper</u>

	Max	Min	Avg
Length	36	35	35 5
Width	27	16	21 5
Thickness	17	08	12 5
Weight	4 9	4 8	4 85

Material	Count
Basaltic	0
Obsidian	0
Chert	2

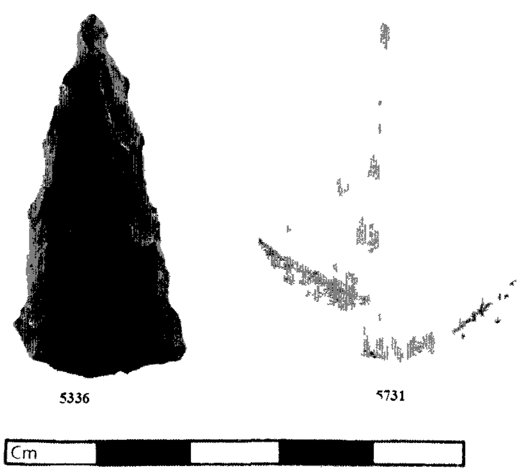

Figure 46: Awls with end scrapers

These two tools are unifacial flake-based tools with the distal end retouched to form a steep, rounded edge typical of end scrapers, while the proximal end is retouched to a sharp, but thick point that could be utilized as an awl, or possibly a graver (Fig. 46). These appear to be a multi purpose tool, possibly specialized to a specific task.

Awl

	Max	Min	Avg
Length	34	25	29 0
Width	26	10	19 6
Thickness	07	02	04 6
Weight	5 3	0 8	2 27

Material	Count
Basaltic	2
Obsidian	0
Chert	4

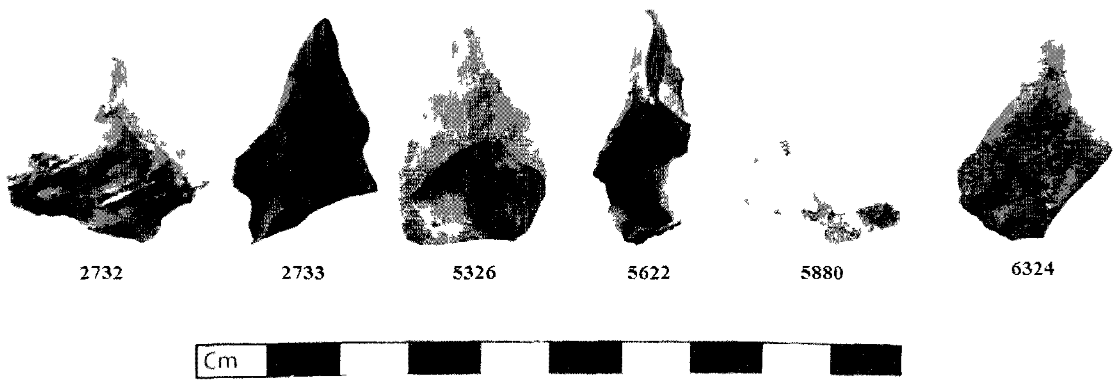

Figure 47: Awls

This tool type is unifacially worked to a point that could be utilized as an awl, or possibly a drill bit or graver, while the opposite end has no specific form. There is a variety of shapes, but an overall consistency of size. The raw material utilized tends to be fine grained and not brittle, suggesting these traits are necessary for the tools, however the variety of material and unfinished shapes suggest a certain expedient nature (Fig. 47).

Dorothy Nome and Lucy Laurent agreed that these tools would have worked as awls for sewing and working with hides (Personal Communication, November 20, 2009).

Uniface/Core scraper

	Max	Min	Avg
Length	41	41	41 0
Width	38	34	36.0
Thickness	17	16	16 5
Weight	42 1	24 3	33.20

Material	Count
Basaltic	2
Obsidian	0
Chert	0

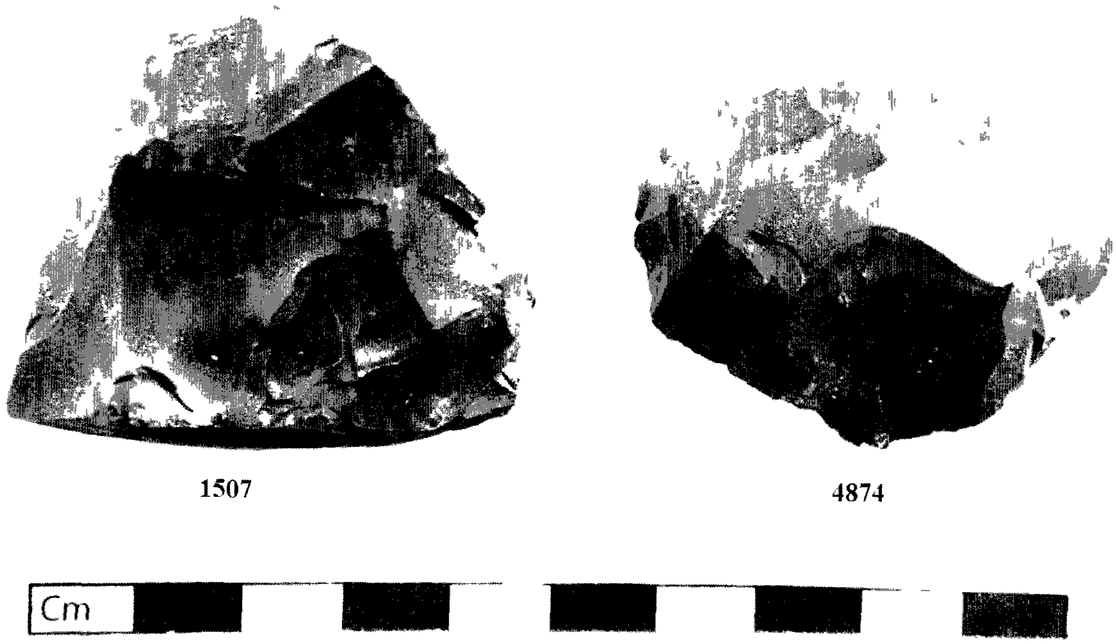

Figure 48: Uniface core scraper

These two large, crude and bulky scrapers appear to be reduced cores that developed steep edges through the reduction process were then retouched to create scraper edges. They are large, bulky tools, and both are made on fine grained dacite material. Piece 1507 (Fig 48) is more crudely made, with only one working edge, while piece 4874 (Fig. 48) may have a more intentional design, worked to some extent all around the edge.

Miscellaneous edge scraper

	Max	Min	Avg
Length	45	21	34.0
Width	32	17	25.6
Thickness	11	04	07.8
Weight	14.2	2.1	7.98

Material	Count
Basaltic	7
Obsidian	0
Chert	1

These tools are scrapers, so defined by steeply retouched edges. They do not fall into the previous categories due to different overall morphologies, largely due to more than one edge being retouched and steepened to a scraper edge (Figs. 49 and 50).

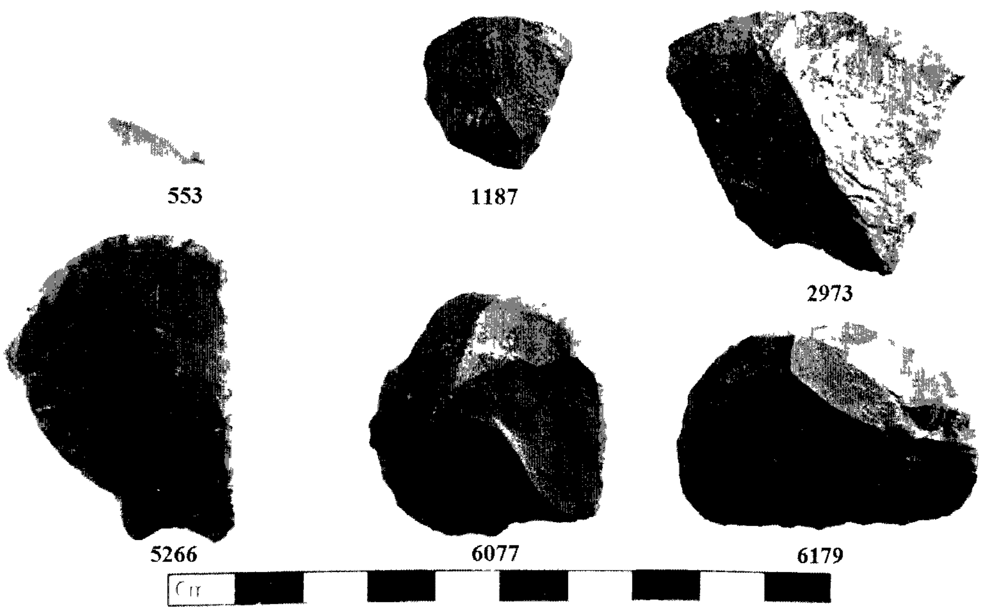

Figure 49: Miscellaneous edge scrapers

Two of these items stand out, 2543 and 6546 (Fig. 50), as a few bifacial flake removals were made to reduce the flake to the desired thickness, and then unimarginal and unifacial retouch was used to create a scraper edge along a long, convex edge. Item number 6546 is clearly made from a large primary flake with cobble cortex present on one face, and is large enough to be a hand held scraper Artifact 2643 may be a fragment of a large tool, or may have been intentionally formed on a piece of flake fragment

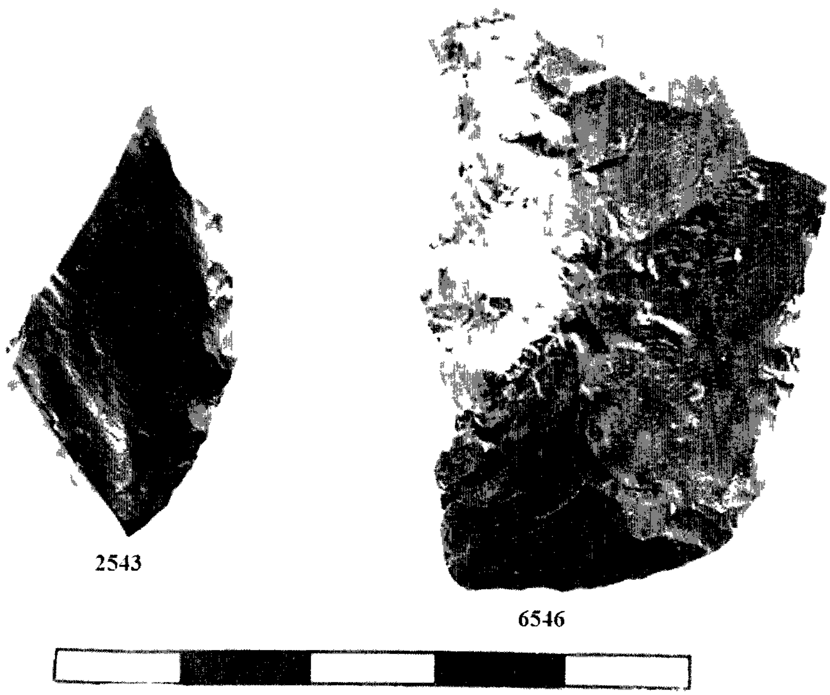

Figure 50: Edge scraper with bifacial forming

<u>Miscellaneous scraper fragments</u>

	Max	Min	Avg.
Length	3 9	0 8	2 26
Width	3 3	0 5	2 31
Thickness	1 2	0 1	0 66
Weight	10 6	0 6	5 28

Material	Count
Basaltic	6
Obsidian	1
Chert	3

This category is composed of fragments of steep edge angled scraper tools These pieces are too fragmentary to classify as a specific scraper type

Blade Tools

Macroblade blanks

	Max	Min	Avg
Length	59	17	37.8
Width	22	10	15.5
Thickness	08	01	04.2
Weight	7.9	0.5	2.71

Material	Count
Basaltic	10
Quartzite	0
Chert	9
Obsidian	0

Macroblades are small lithics that are so named to differentiate them from microblades. They are blade-shaped flake blanks that are generally longer, and more importantly wider that microblades (Fig. 51). Macroblades are defined as being more than 10 mm wide and they tend to be longer than 20 mm (Browman and Munsell 1972). Sanger (1968:94) does not agree that defining the type based on width is relevant in the Pacific Northwest, however he does note that macroblades are distinctly different from microblades, and some definition of types must be established.

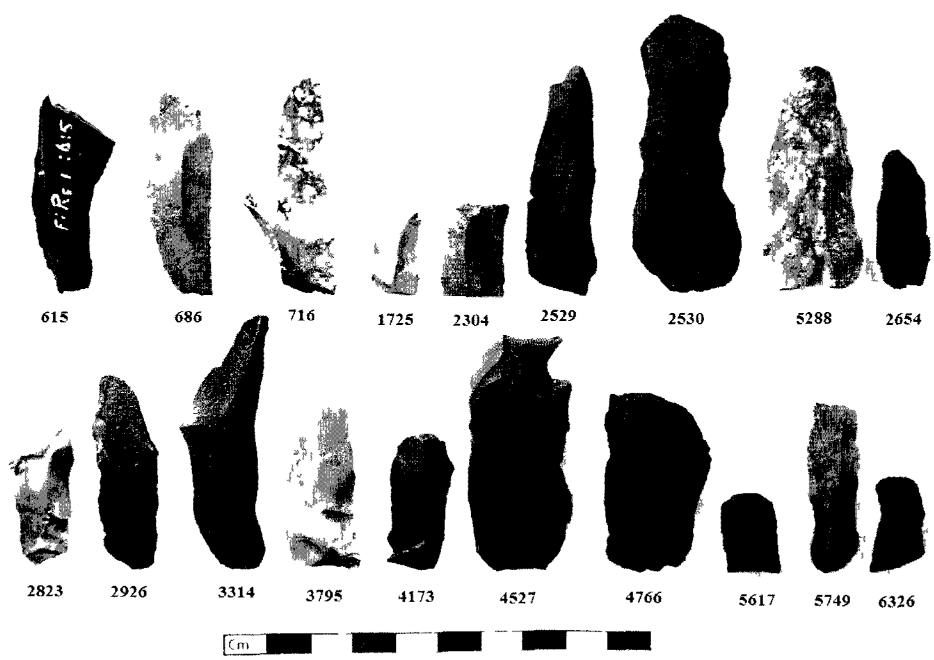

Figure 51: Macroblade blanks

They are considered a tool type because blade technology represents a specific reduction technique and therefore can reflect design decisions and technological organization (Clark 2001), and because macroblades could be hafted lengthwise along a handle to make a long blade. Fine grained materials dominate, almost half of the macroblade blanks are chert, a much higher percentage than the assemblage as a whole and the remaining basaltic artifacts are mostly fine grained varieties (Fig. 51). This is to be expected for a small tool needing to be thin, sharp and strong.

Blades with marginal retouch

	Max	Min	Avg
Length	52	18	39.9
Width	21	10	13.9
Thickness	06	03	04.0
Weight	3.9	0.7	2.33

Material	Count
Basaltic	4
Quartzite	0
Chert	4
Obsidian	0

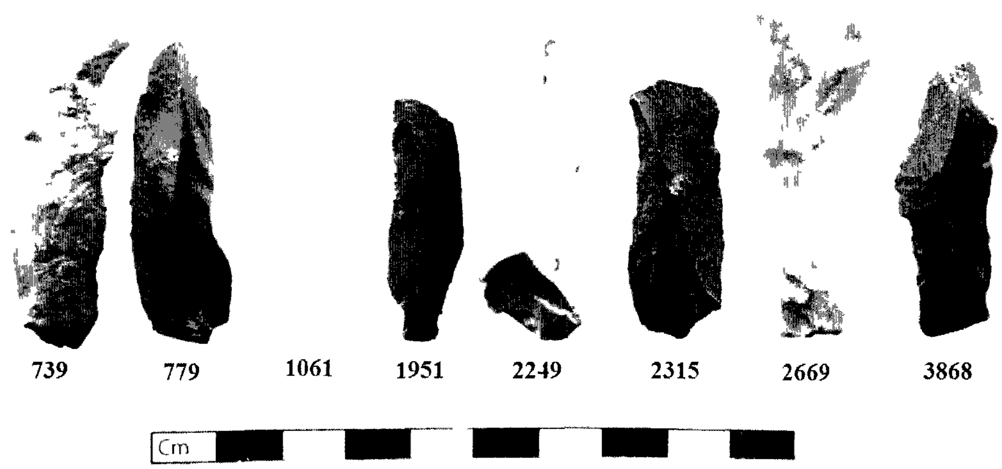

Figure 52: Blades with marginal retouch

Retouched blades are blade blanks with have been retouched marginally at any location other that the thicker, proximal end. Usually this refers to a retouched longitudinal edge. Microblades and macroblade blanks are both represented in this category for simplicity and to highlight that the retouch is what sets them apart from other blade tools. As with the other blade categories, these tools are all made on fine grained materials, a significant percentage of which are chert varieties, and basaltic materials represented tend to be finer grained (Fig. 52).

<u>Blade end tools</u>

	Max	**Min**	**Avg**
Length	43	26	33.7
Width	21	18	19.3
Thickness	08	05	06.7
Weight	5.5	3.4	4.23

Material	**Count**
Basaltic	1
Quartzite	0
Chert	2
Obsidian	0

Figure 53: Blade end tools

Blade end tools are made on macroblade blanks, but have some bifacial working and retouch to create steep scraper edges at the proximal, platform end of the blade (Fig.

53). The distal, terminal end of the flake is unmodified and materials used are similar to other blade categories.

Blade tool fragment

	Max	Min	Avg
Length	26	12	19 7
Width	19	07	12.8
Thickness	04	02	03 1
Weight	1 7	0 3	1 06

Material	Count
Basaltic	0
Quartzite	0
Chert	9
Obsidian	0

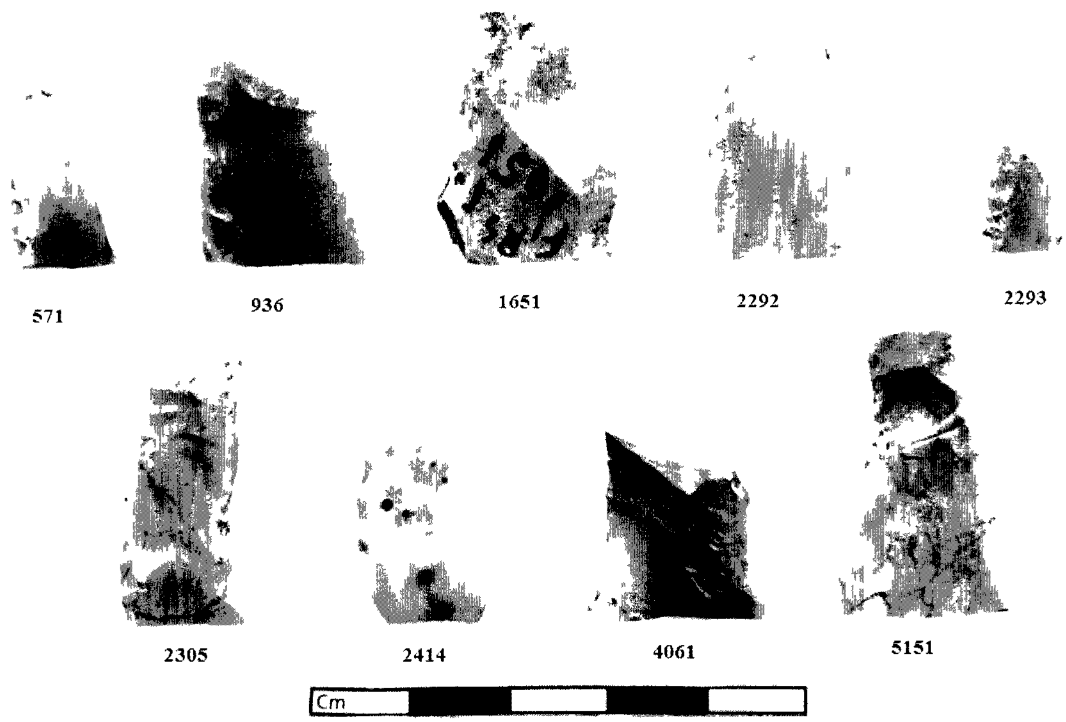

Figure 54: Blade tool fragments

Blade tool fragments are blade blanks with some marginal retouch that are too fragmentary to identify as specific tool types (Fig. 54). They most likely are simple blade blanks with some retouch, as identified above, however they may be fragments of key-shaped scrapers, awls or other unidentified tools. All made of chert of a variety of visual characteristics, as is the case with other blade tool types. These fine grained materials seem to be preferred for the blade technologies as they can produce a thin, sharp edge (Luedtke1992:80). Why fine-grained dacites, which can also produce a thin, sharp edge, and appear elsewhere in the assemblage, are rarely utilized for blade manufacture is unclear.

Microblades

	Max	Min	Avg
Length	32	07	18 6
Width	09	04	06 9
Thickness	04	01	02 1
Weight	1	0 1	0 28

Material	Count
Basaltic	16
Quartzite	0
Chert	3
Obsidian	0

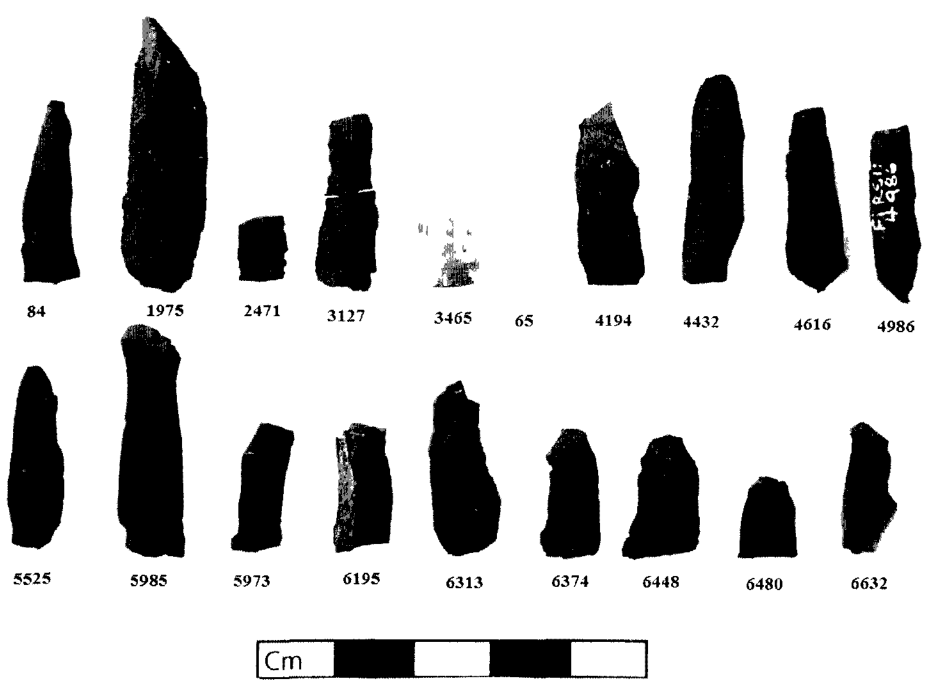

Figure 55: Microblades

Microblades are similar to macroblade blanks, with parallel longitudinal sides and a dorsal ridge resulting from a specific technique of core reduction (Fig. 55). Their defining quality is their size; microblades are narrower than 10 mm. Criteria for defining microblades vary based on region and researcher (Sanger 1968), however through the Plateau and to the Arctic, the width is generally considered to be the most important characteristic and a generally short length naturally follows (Browman and Munsell 1972; Clark 2001). Although there is an array of literature on microblades in the Pacific Northwest, there is little agreement on the exact definition of the term and its cultural affiliations. The microblade is included as a tool type as they could be set lengthwise along a handle, making a long, sharp knife blade (Wyatt 1970:103).

Unimarginal Tools

Concave edge margins

	Max	Min	Avg
Length	70	13	31.8
Width	65	12	26.8
Thickness	18	02	05.8
Weight	64.9	0.3	5.15

Material	Count
Basaltic	44
Obsidian	1
Chert	7

This is a large division of flake tools that are only retouched along one face of one edge margin, creating a concave edge (Fig 56). The raw materials utilized for this tool type are quite varied from the coarsest basaltic material through to obsidian in percentages that seem to reflect the assemblage on the whole, suggesting they on whatever flakes are on hand. Marginal retouch is differentiated from facial reduction by only impacting less than 5mm across the face of the tool from the edge (Magne 1985; Odell 2003:45).

Figure 56: Concave edge margins, FiRs-1:5915

Convex edge margins

	Max	Min	Avg
Length	87	10	30.4
Width	59	09	24.6
Thickness	18	01	06.1
Weight	64	0.3	6.58

Material	Count
Basaltic	58
Obsidian	1
Quartzite	1
Chert	6

This is another large category of flake tools that are only retouched along one face of one edge margin, in this case creating a convex edge (Fig. 57). As with the above description, a wide variety of raw materials utilized and a variety of flake shapes and sizes selected for the base, further emphasizing the expedient nature of this tool type.

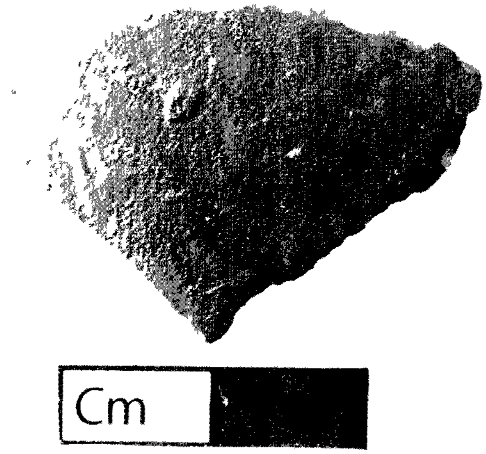

Figure 57: Convex edge margins, example, FiRs-1:1552

Single straight edge

	Max	Min	Avg
Length	63	08	30 3
Width	54	06	25 7
Thickness	17	01	05 6
Weight	40 9	0 1	5 74

Material	Count
Basaltic	88
Quartzite	0
Chert	15
Obsidian	2

Figure 58: Single straight edge margin, FiRs-1:717

The largest of these categories of flake tools that are only retouched along one face of one edge margin, which in this case is creates a straight edge (Fig. 58). As with the similar groups, a wide variety of raw materials and shapes and sizes are represented suggest an expedient nature to these tools.

Multiple edge margins

	Max	Min	Avg
Length	116	08	29.1
Width	54	07	23.3
Thickness	11	01	04.3
Weight	13.4	0.4	3.25

Material	Count
Basaltic	62
Quartzite	1
Chert	21
Obsidian	3

These unimarginal flake tools are retouched on more than one edge, but still entirely on the same face (Fig. 59). Sometime the retouched edges are contiguous or converging and in other cases they are opposed, but overall they appear to be expedient in nature, and do not suggest an intent to further forming of a tool. A wide variety of raw materials are represented here, as with other marginal tools.

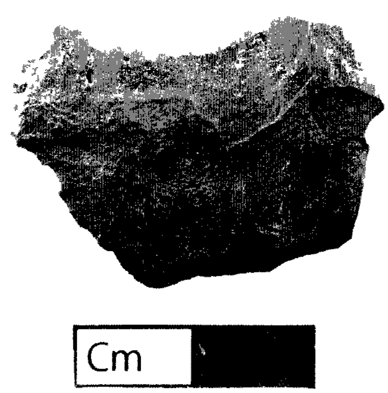

Figure 59: Multiple edge margin, example, FiRs-1:2485

Some of these appear to be made on thinning flakes, with more extensive flake scaring on the dorsal surface and marginally worked to form flat, sub-triangular to sub-rectangular forms (Fig. 60). The large majority of these are made with chalcedonies, which is unusual given that basaltic material dominates the assemblage. The singular basaltic example is made of some of the finest grain material observed at the Punchaw Lake site. Several of the colour variations found in these cherts are not otherwise represented in other tools in the assemblage. These tools may be an attempt to maximize use of rare, fine grained materials.

J. Morris Boyd and Doreen Patrick, of the Nazko First Nation, indicated that the sharp, thin edges of these tools, particularly the larger ones, would be ideal for cutting the bark of trees to prepare for scraping sap and cambium (Personal Communication, December 11, 2009).

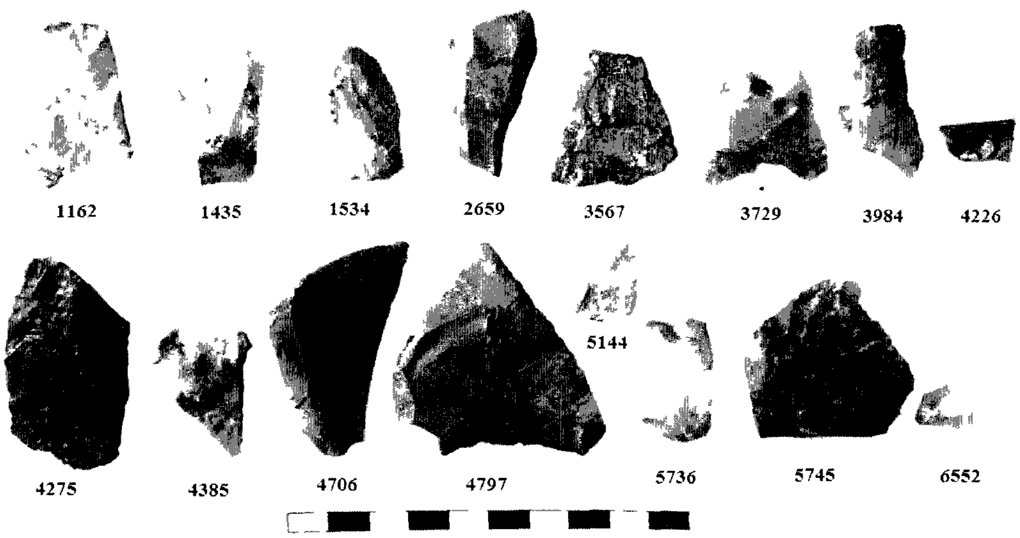

Figure 60: Possible bark cutting unimarginal tools

<u>Multiple edges, convex projection</u>

	Max	Min	Avg
Length	61	11	29 6
Width	62	08	25 9
Thickness	12	01	04 8
Weight	32 4	0 5	5 53

Material	Count
Basaltic	51
Obsidian	0
Chert	4

As with the previous category of multiple edged unimarginal flake tools these are retouched on more that one edge, but all from the same face, often with the retouched edges being contiguous (Fig. 61). This type is defined by one of the unimarginal edges, or converging retouched edges, forming a rounded projection on the tool. The intended purpose of this tool is unclear; however the projection does seem to be a design decision which is the reasoning behind making this a distinct category. These projections stand out as distinctive in morphology and were likely made with a specific task in mind.

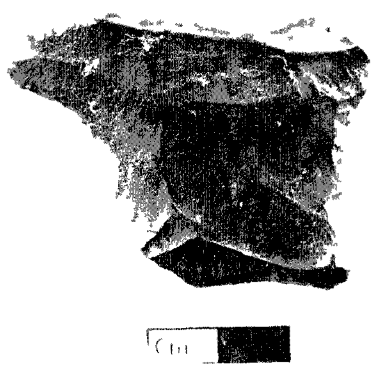

Figure 61: Multiple edge margins, convex projection, FiRs-1:3182

Bimarginal Tools

Single edge

	Max	Min	Avg
Length	73	14	35.4
Width	57	12	28.0
Thickness	33	01	07.3
Weight	84.8	0.3	9.78

Material	Count
Basaltic	41
Obsidian	1
Chert	0
Quartzite	0

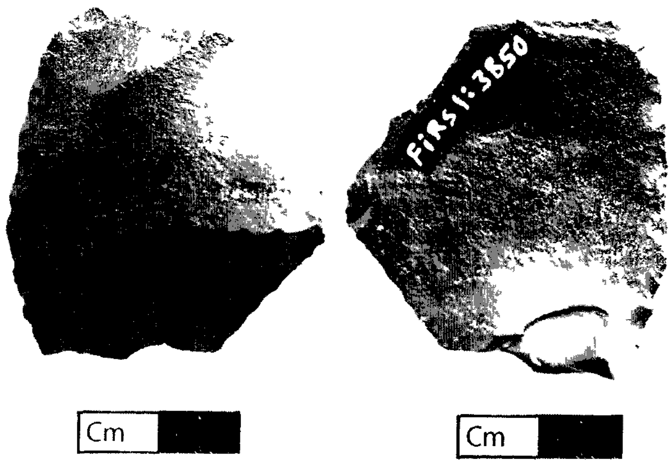

Figure 62: Example of bimarginal, single edge, front and back views, FiRs-1:3850

Bimarginal tools are marginally retouched on both faces of the flake blank (Fig. 62). As with unimarginal tools, the retouch does not impact further than five mm from the edge of the tool. In the single edge bimarginal group a single edge is retouched on both sides. This creates a slight thicker and therefore stronger edge than the flake alone. Almost all of these are on coarser grained basaltic materials, with the exception of a single obsidian piece.

<u>Multiple edges</u>

	Max	Min	Avg
Length	65	12	31.3
Width	60	10	26.3
Thickness	14	03	05.1
Weight	25.1	0 2	4 85

Material	Count
Basaltic	69
Quartzite	0
Chert	7
Obsidian	0

Figure 63: Bimarginal crushed tool, FiRs-1:3309

These bimarginal tools are identified as being marginally retouched on different edges and on opposite faces of the flake blank, not on opposite faces of the same edge. This use on different edges and different sides may indicate that they were being retouched and reused on more than one occasion. Like the single edged bimarginal tools, the large majority of these are made on a variety of materials of different qualities, primarily coarse basaltic materials.

Artifact 3309 (Fig. 63) stands out in this type as an almost blade shaped flake with extensive chipping, bifacial flaking and crushing along the proximal (platform) edge and adjacent margins of the blank. The basaltic material utilized is fine grained.

Contiguous single edge

	Max	Min	Avg
Length	91	11	38.7
Width	62	10	26.7
Thickness	29	0.1	07.4
Weight	112.5	0.6	11 62

Material	Count
Basaltic	20
Argillite	1
Chert	1
Quartzite	1

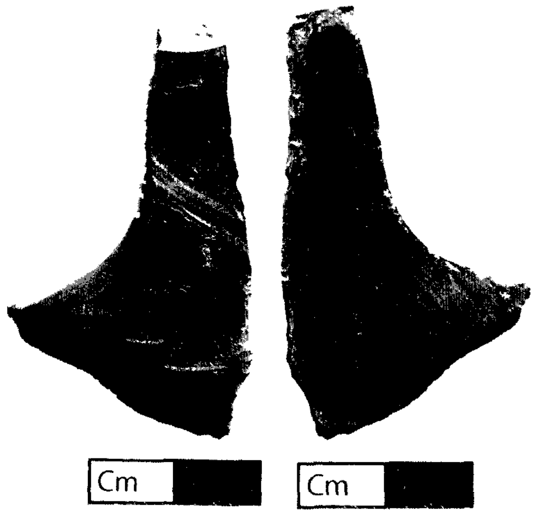

Figure 64: Example, bimarginal contiguous single edge, front and back views, worked edge in middle of photo, FiRs-1:3602

Contiguous single edged bimarginal tool is a slightly awkward name for a tool that is not complex, but difficult to describe. These flake tools are retouched along a single edge, beginning on one face and switching to the opposing face halfway along, half being retouch on one face, next half being retouched on the opposite face (Figs. 64 and 65). As with other marginal tools they are based on flake blanks of all different shapes and sizes, and a variety of material qualities, but mostly basaltic. The flipping of the tool halfway through manufacture of the edge must have been an intentional technique, however it is difficult to guess the purpose of this tool. It is unlikely this bimarginal pattern is the result of use wear; the worked edge tapers and flips to the opposite side of the edge in a consistant pattern in all examples.

Figure 65: Magnified edge view of a contiguous single margin tool, FiRs-1:148

Cortical Spall Tools

Cortical spall scraper

	Max	Min	Avg
Length	145	48	92 4
Width	109	33	75 0
Thickness	31	08	19 4
Weight	327 3	10 7	165 55

Material	Count
Basaltic	5
Argilite	2
Chert	1
Quartzite	16
Metamorphic	3

Cortical spalls are large, circular, primary flakes off of cobble cores (Fig. 66). As such, one face of the flake will be entirely cortex. These spalls are then selected and minor marginally retouched, with some unifacial flaking to dull the edge and to create a coarse and continuous, rounded scraping edge. These tools are primarily used to soften hides as part of the tanning process.

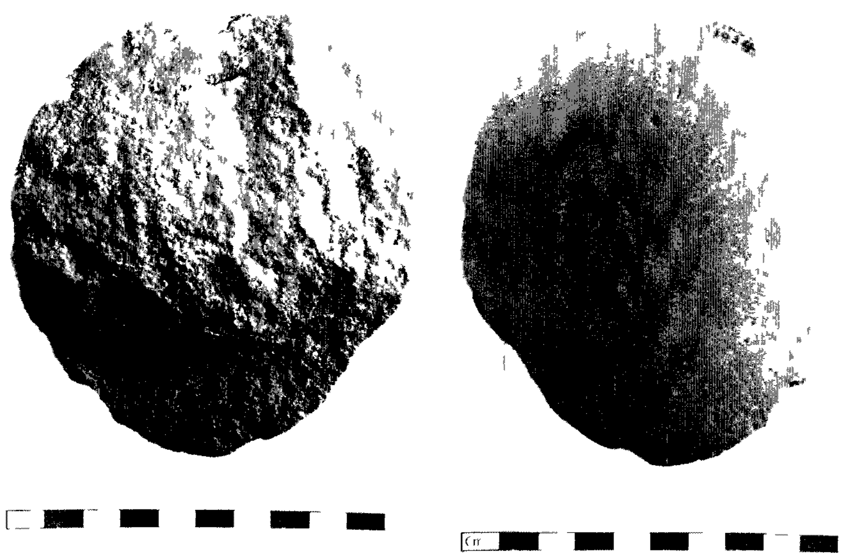

Figure 66: Cortical spall scraper, both faces of FiRs-1:1034

Dorothy Nome and Lucy Laurent are both familiar with the spall scrapers, although did not recognize a difference between the tchithos (see below) and the spall scrapers. Both individuals had seen their mothers use this type of tool to scrape and soften hides. The spall scrapers were hafted on a handle by wrapping it with cord. Lucy Laurent still has her mother's spall scraper (Personal Communication, November 20, 2009). J. Morris Boyd also recognized this as a scraping tool for working hide. Doreen Patrick noted that these duller tools would have been used to dry and soften the hide in the second stage of preparing hide, and reiterated that a stick handle would have been affixed (Personal Communication, December 11, 2009).

Tchithos

	Max	**Min**	**Avg**
Length	94	19	67.6
Width	86	41	63.2
Thickness	20	09	14.4
Weight	150.8	22.3	94.82

Material	**Count**
Basaltic	0
Quartzite	4
Argilite	0
Metamorphic	2

These cortical spalls are retouched, flaked and ground to create a coarse and smooth scraping edge, much like the typical cortical spall scrapers (Fig. 67). Tchithos are differentiated by being also worked to narrow the opposite edge to create a hafting element. This tool type is described and identified ethnographically as being related to Athapaskan culture groups (Morice 1893).

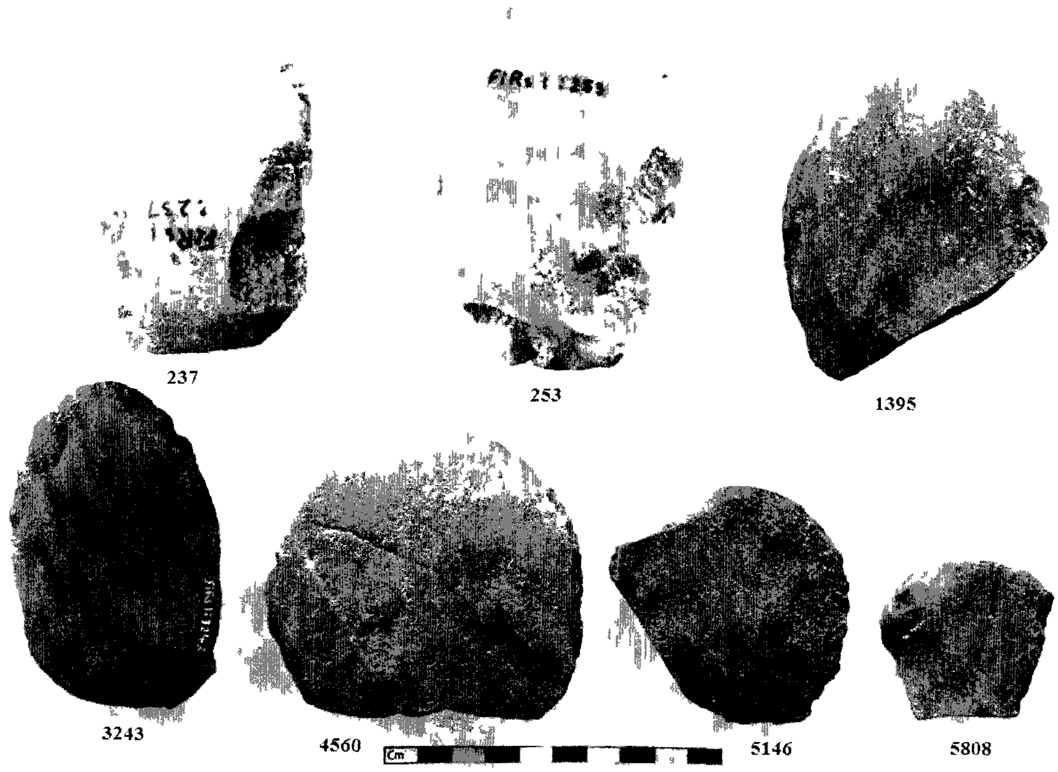

Figure 67: Tchithos

Groundstone Tools

Carvıng

Heıght 47 Length. 35 Wıdth 26 Weıght 37 1

There ıs only one stone worked artıfact that could be ıdentıfied as prımarıly manufactured for ıdeologıcal or symbolıc purposes (Fıg 68) The carved markıngs on thıs fragmentary pıece suggest ıt may have been an artıstıc or decoratıve pıece or some sort of anthropomorphic or zoomorphic representation which can be referred to as an effigy (Wonderley 2005:213). Unfortunately this item is too fragmentary to be identified more specifically. The piece is ground to a small column of material with rounded corners, with incised marks across the surface creating cross-hatched patterns. While not identifiable, this piece does represent design choice, and therefore gives evidence regarding technological strategies.

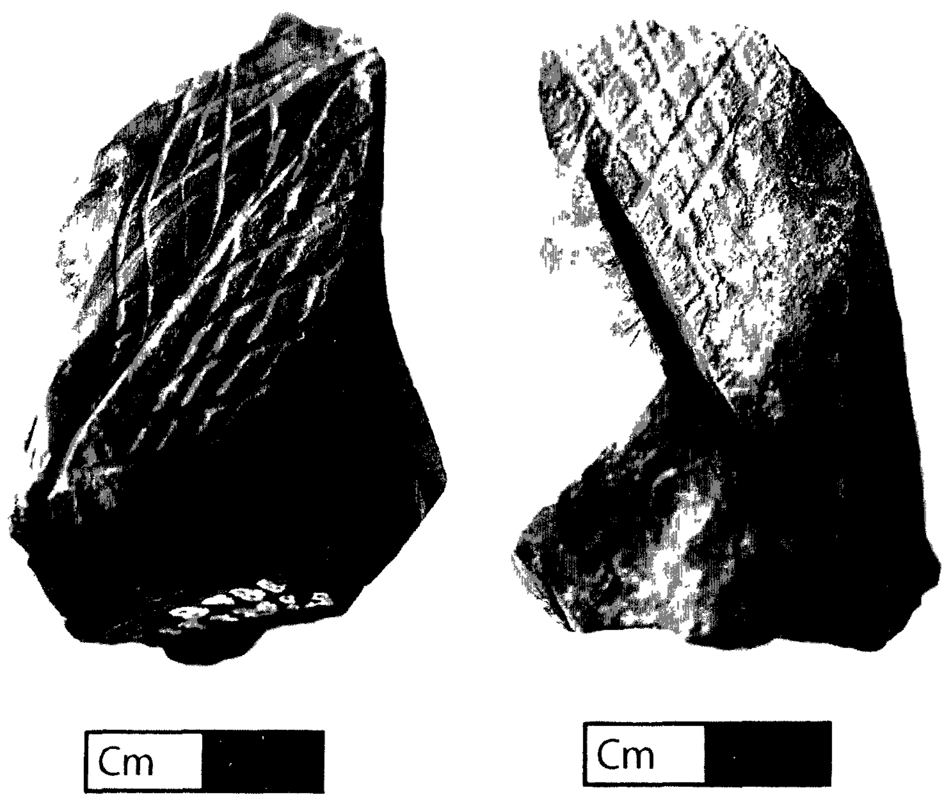

Figure 68: Carving fragments, front and back views FiRs-1: 1968

Broad Axe-head

Length: 14 Width: 40 Thickness: 2 Weight: 37.1

Figure 69: Broad axe-head, FiRs-1:4106

Artifact FiRs-1:4106 (Fig. 69) is a flat rectangular piece of argillite that has been both chipped and ground. One face is ground smooth and one of the shorter edges on this face is ground to sharpen it like the blade of an axe head. On this face all of the edges are chipped and flaked to shape the rectangle. The opposite face is not ground and polished at all, but is chipped and flaked on all edges to shape, including the blade end of the axe. In cross section this tool is thin equally along the body of the tool, only thinning to the blade edge. This combination of polishing and flaking was recognized on Dakelh axe heads and chisels by A.G. Morice (1893:41).

Miscellaneous Ground-stone tools

	Max	Min	Avg
Length	123	25	67.4
Width	63	20	34.0
Thickness	32	03	13.4
Weight	177	2.3	78.46

Material	Count
Greenstone	1
Shale	1
Schist	1
Sandstone	2

These are coarse, possible unfinished groundstone tools that do not fit into commonly used groundstone categories. They are not fully formed, exhibiting some smoothing and grinding along at least one face or edge (Fig. 70).

The smooth edges of an axe or chisel reminded J. Morris Boyd, of the Nazko First Nation, of hide scraping and its long body would have been useful for either holding or hafting (Personal Communication, December 11, 2009).

Figure 70: Miscellaneous groundstone tool, FiRs-1:5903

Flake from groundstone tool

	Max	Min	Avg
Length	53	19	31.8
Width	39	10	23.0
Thickness	06	01	03.2
Weight	10	0.2	4.66

Material	Count
Greenstone	7
Slate	1
Argilite	0
Metamorphic	0

No complete ground-stone tools were identified within the Punchaw Lake assemblage. Some of the only evidence of ground-stone at the site is this small collection of flakes clearly knapped off some larger ground-stone tool. The original tool type, or the purpose of the flake removal is unknown. Although these items fall properly into the debitage category, they may reflect evidence of recycling and reusing rare raw materials. These artifacts raise the question of where the greenstone was obtained, and why there is so little of it that no complete ground stone tools were identified.

Unidentifiable tool fragment

	Max	**Min**	**Avg**
Length	123	18	52.5
Width	63	14	34.4
Thickness	32	03	12.5
Weight	177	1.8	55.85

Material	**Count**
Greenstone	3
Basaltic	1
Steatite	1

Further evidence of groundstone tools at the site is found in small fragments, too small to identify the original tool types (Fig. 71). These are not flakes or flaked groundstone tools as above, they do not appear to be attempts to salvage the raw material, they are broken pieces of unidentifiable tool types. One of the largest fragments, number 6000 appears to be the distal half of an axe head, but is also extensively chipped in several places. The extent of this chipping appears to be intentional attempts to reshape or reuse the form.

Figure 71: Examples of unidentified groundstone tools fragments

Miscellaneous Tools

All tools in this category are complete or mostly complete, but do not fit well into the categories listed above. These worked stone tools have distinctive shapes that stand out as possibly intentional forms, often made by combining different techniques.

<u>End scraper with bifacially reduced contracting tails</u>

	Max	Min	Avg
Length	52	25	40.6
Width	42	24	30.8
Thickness	17	06	09.4
Weight	25.2	3.7	11.58

Material	Count
Basaltic	4
Obsidian	0
Chert	1

These five tools have one end typical of a 'thumbnail' type endscraper, quite thick, with a steep edge angle, and unifacial retouch (Fig. 72). They are different as the stems, or tails of these tools are bifacially reduced to contract to a near-point. All of these examples are made on fine-grained material, such as dacite and high quality chert. This use of fine material and the specific shaping using different reduction techniques indicate that this tool is carefully and intentionally formed.

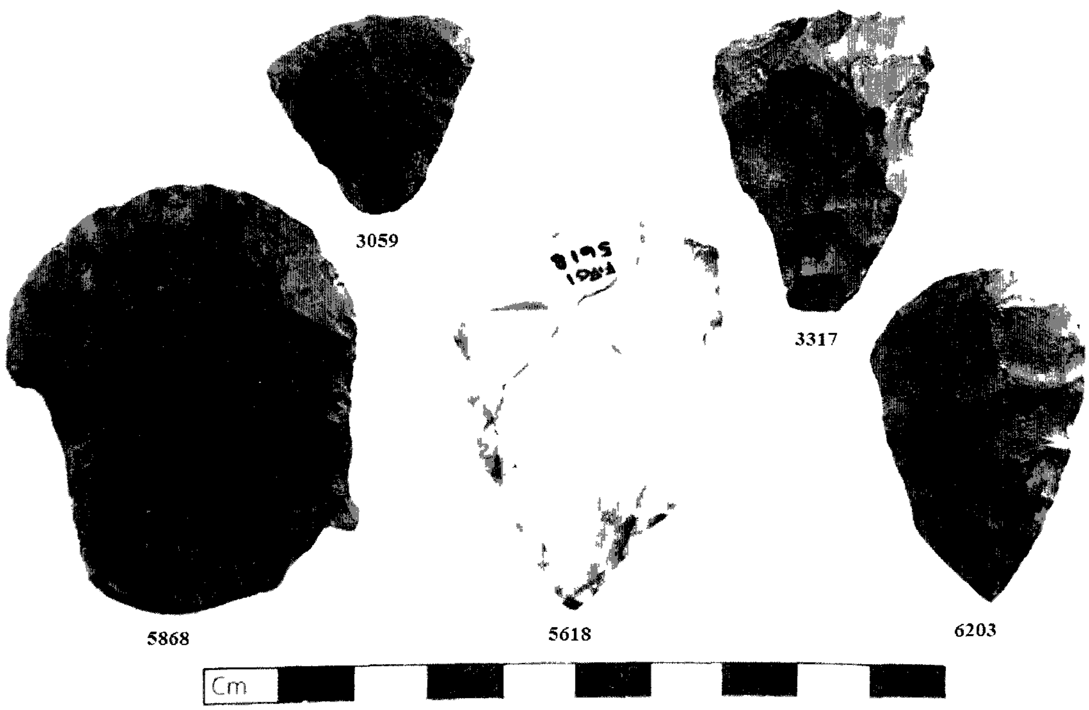

Figure 72: Endscrapers with bifacially reduced contracting tails

Unifacial and Marginal Tool

Length: 3.6   Width: 2.1   Thickness: 0.6   Weight: 3.5

Item 5537 is an unusual V-shaped tool, based on a flake of opaque, white chert (Fig. 73). One concave edge is marginally retouched along both edges. The ends and the convex side are unifacially worked to be rounded. The third side is slightly concave with unimarginal retouch. Made on a fine grained, rare material and so extensively worked, this could represent a sort of curated multi-tool. However, it may be simply a practice piece for working on techniques.

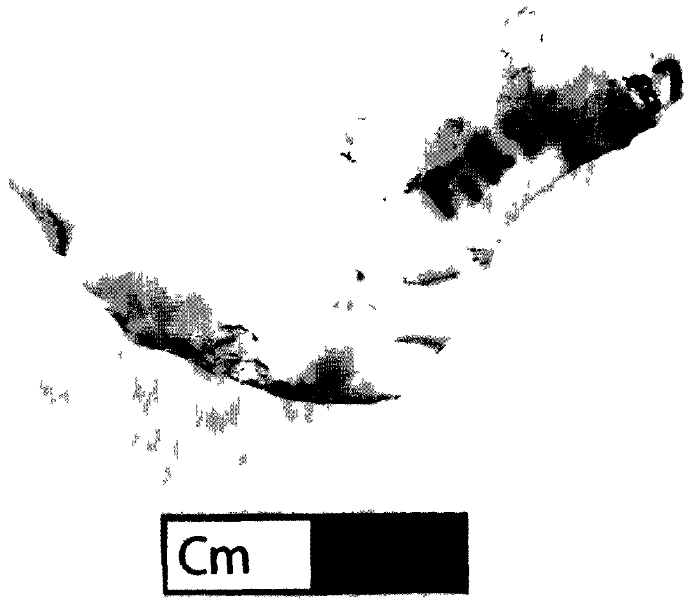

Figure 73: Unifacial and marginal tools, FiRs-1:5537

<u>Bifacial and bimarginal tool</u>

Length: 5.9 Width: 2.6 Thickness: 0.7 Weight: 8.4

Item 5959 (Fig. 74) is made on a basaltic flake and is worked both bifacially and bimarginally to a wide willow leaf shape. The thicker proximal end of the flake blank is bifacially worked to a continuous convex edge. The opposed edge is thinner and is bimarginally worked to a similar convex edge shape. This item is in the miscellaneous category due to its unique combination of bifacial and bimarginal edges to create a distinctive morphology.

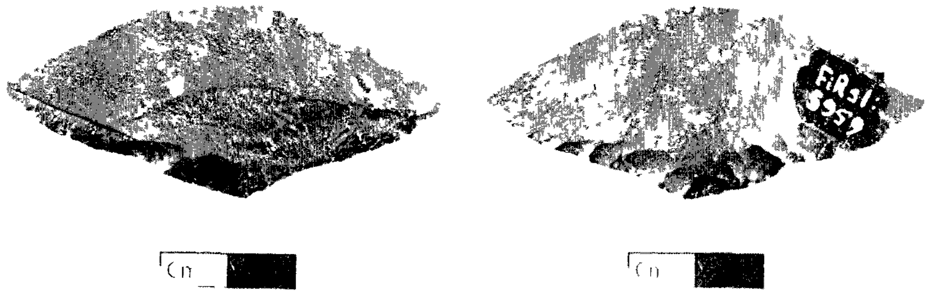

Figure 74: Bifacial and bimarginal tool, FiRs-1:5959 - both faces

Bevelled edge tool

Length: 2.1 Width: 2.1 Thickness: 0.6 Weight: 3.5

Tool 2878 is a small, square piece made on coarse grained basaltic material (Fig. 75). Unifacial working on opposed edges and on opposite faces creates a bevelled profile. The edges are not sufficiently angled to be used for scraping, it may have been used as some sort of wedge.

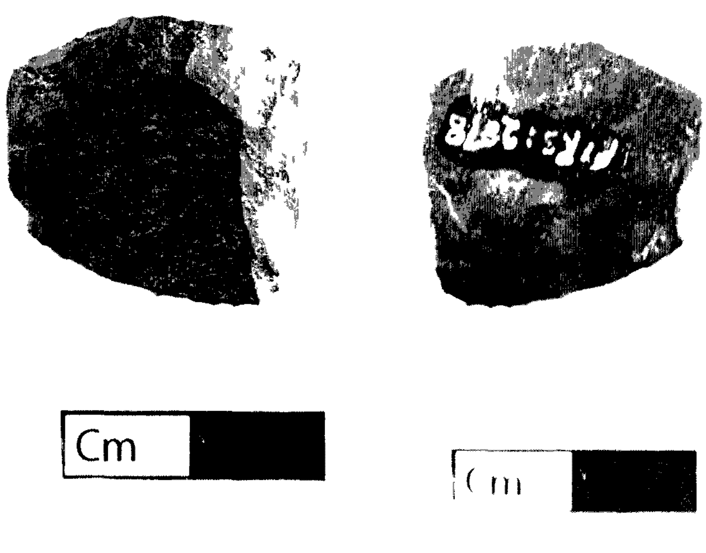

Figure 75: Bevelled edge tool. FiRs-1:2878 - both faces

Cores

Almost all the cores in the Punchaw Lake assemblage are exhausted cores. This is not surprising given that most of the raw lithic material used at the site is in the form of small river cobbles. In many cases, such as larger biface tools, the tool itself and flake debitage may be all that remains with no left-over, discarded core. As such the general definition for cores at this site is any lithic piece from which flakes have been removed, but which does not have the attributes that would define it as a flake, a biface or an uniface (Andrefsky 1998:20).

<u>Blade Cores</u>

	Max	Min	Avg
Length	32	15	24.0
Width	27	13	18.8
Thickness	22	07	14.2
Weight	20.9	2.1	10.03

Material	Count
Basaltic	4
Chert	1
Obsidian	0
Quartzite	1

Blade cores are a specific type of unidirectional core from which blade blanks are removed. The 6 cores in this collection are small and would produce small blades or microblades (Fig. 76). Indentifying characteristics are primarily observable as flake scars of parallel lateral edges along the core. Using the top of the peak between two adjacent scars as the platform for the next removal would produce a blade that is triangulate in cross section with parallel lateral edges. Subsequent removals along the face of the core would produce a series of similar sized blades.

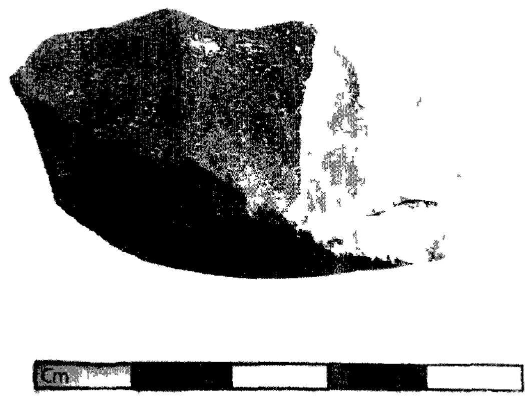

Figure 76: Example, Blade core, FiRs-1:4185

This is small collection of blade cores, fewer than would have been necessary to produce the number and variety of blade tools and blanks from the site. These few cores are small and mostly of common basaltic material, while the blade sample is relatively large and diverse and a much wider variety of materials are utilized. This may suggest that many of the blades on rarer material were brought in from off-site as finished products. Blade use was clearly desirable; however blade production was not a common technique.

<u>Bipolar Cores</u>

	Max	Min	Avg.
Length	5.4	1.8	3.36
Width	5.3	1.4	3.05
Thickness	2.1	0.5	1.16
Weight	53.5	1.6	17.05

Material	Count
Basaltic	12
Chert	1
Obsidian	2
Igneous	1

Bipolar cores, while more numerous than blade cores, are still not present in great numbers, and as such are not a common strategy. They are small, exhausted cores, with extensive flake removal from two opposed directions and extensive crushing on the opposed edges is noted (Fig. 77). Four of these bipolar cores are of rarer materials, including two of obsidian, which is interesting as it is a strategy that is often considered a method of conservation of materials (Andrefsky 1998:227; Barham 1987). However, the majority are of common basaltic materials.

Figure 77: Example, Bipolar core, FiRs-1:5090

Unidirectional Cores

	Max	Min	Avg
Length	86	16	45.1
Width	70	19	38.9
Thickness	40	10	19.1
Weight	161.3	2.7	41.34

Material	Count
Basaltic	28
Chert	1
Obsidian	0
Argilite	1

Unidirectional cores are discarded and expended cores from which flakes have been removed in the same direction from any face (Fig. 78). The flake scars are varied in shape and size as are the cores themselves, giving evidence of no standardized form or intention. This would suggest that these cores are part of an expedient technology that is intended to produce flakes of varying size that can be used as is or subject to minor retouch for use.

1138

5738

Figure 78: Examples, Unidirectional cores

Multidirectional Cores

	Max	Min	Avg
Length	70	09	37.1
Width	78	06	31.8
Thickness	38	02	15.5
Weight	134	0.5	23.89

Material	Count
Basaltic	87
Argillite	1
Chert	20
Quartzite	1
Obsidian	5

Multidirectional cores are discarded and expended cores from which flakes have been removed in more than one direction from any face (Fig. 79). Much like the unidirectional cores, the flakes scar indicate that no specific pattern or intended shape is identifiable and it seems likely that these were used to produce flakes for expedient use.

This category by far represents the largest numbers of core type and therefore a common strategy.

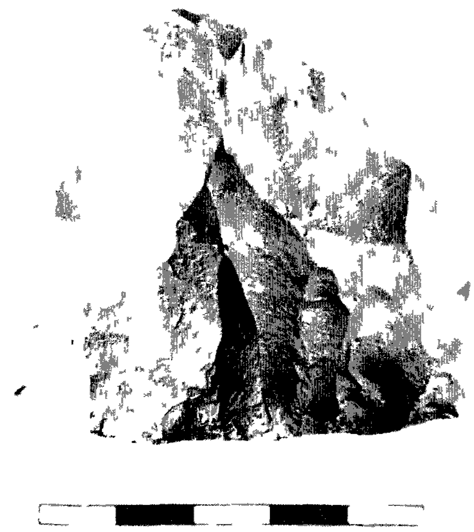

Figure 79: Example, Multidirectional core, FiRs-1:5516

Discussion

The discussion of the assemblage focuses on comparing the analysis to the expectations that were developed for each design constraint category as outlined in Chapter Three. Interpretations reference the concepts of design theory and of technological organization. This is followed by a examination of the artifact distribution patterns between the two main excavation areas, as a secondary concern of this research. The final discussion section highlights and summarizes the views and information given by the Nazko Elders. As the Nazko memories and stories were both descriptive of tool use itself and of ways of life in the past, some of this information has been integrated into understanding the constraints on the tool makers at the Punchaw Lake village; this section puts these details into context with all of the information that the Nazko Elders wanted to share.

Caution must be applied, however, since these analyses are based on the finds from the excavation of only 0.24% of the site. The discussion should be considered a starting point upon which future research can be built.

Task Requirements

The types of tasks expected to have occurred at the Punchaw Lake site are based on the assumption that the site is a seasonal village location focused on food resources. It is anticipated that building of wooden structures, processing plants and animals for food and materials, and developing and maintaining tools for fishing, traveling, hunting and warfare were important activities going on within the village. In the immediate vicinity of the village, fishing, hunting, trapping and gathering were important tasks.

The rich diversity of tool forms and edge angles represented in the assemblage suggests that the expected wide range of tasks and activities were possible and likely occurring on site. Steep edge angles of varying lengths on convex, straight and concave angles as well are good for smoothing and working wood, bone or antler (Hayden *et al.* 2000:192). Steep and thick edge angles on end scrapers and cortical spall tools are known to work well scraping and softening skins, as affirmed by Elders of the Nazko First Nation, Dorothy Nome and Lucy Laurent (Personal Communication November 20, 2009). Key-shaped scrapers were most likely used to harvest, work and shape branches and strip bark, according to Rousseau's in depth analysis (1992). Acute edge angles on marginal tools, and thin bifaces would work well slicing meat and fine butchery, as well as cutting hide (Hayden 2008; Frison 1989), but would also work to slice and peel bark for cambium collection and numerous other purposes as noted by Doreen Patrick and J. Morris Boyd (Interview, December 11, 2009). Awls, perforators, gravers and drills could be used to pierce holes in hide and wood, or engrave wood, bone or antler. The larger tools with coarse, but sharp edges, such as backed edges, large bifaces and hand-axes can be used to scrape hair off hides being prepared for leathers (Doreen Patrick, Interview, December 11, 2009), for larger butchery tasks (Jones 1980), or wood working tasks, among other things (Hayden 2000:194). Projectile points are common at this site and, while considered to be arrow and spear tips for hunting, they were also being used for warfare in the pre-Contact period in the Central Interior (J. Morris Boyd, Interview, December 11, 2009).

Contrary to expectations, the tools least represented at Punchaw Lake are large scale wood working tools such as axes, adzes, chisels and wedges and large butchery tools that could be used for separating joints and ligaments and breaking through bone. There is only one complete groundstone tool, a broad-head axe, however almost all of its edges are chipped (Fig. 69). Only four hand axes were identified in the biface assemblage (Figure 30 and 31). These are not very significant numbers for tasks such as heavy wood working and construction that are expected at a village site; activities such as chopping wood to build and fix houses, building drying racks, above ground cache structures, and canoes. For some butchery jobs, such as the separation of the large joints of big game animal, the hand axes, as well as some of the large bifaces and backed edges could have also been sufficient. All of the other 18 pieces of ground stone are chips or fragments, only two are identifiable as likely being pieces of greenstone axe heads.

These tools may be in such bad condition because they were rare and were therefore used to exhaustion, indicating that raw materials for such tools were not readily accessible.

One explanation for the minimal numbers of these tools types is that these activities were occurring away from the village. If large game was hunted during the summer season, it would have occurred away from the village, and the kills would be quartered and partially dressed for easier transportation back to the village. These larger tools might then be cached away from the village, closer to the hunting grounds. This argument is also applicable to the wood working tools. As the village grew, people would have to go further out to acquire necessary woods and tools for harvesting and working these woods could be cached away from the village, closer to the work site. However, it must be remembered only a very small portion of the site has been sampled, so conclusions regarding absent materials must be considered tentative. These tools may have been made and stored at the village in preparation for the fall hunting season, but they are in unexcavated portions of the site.

Raw Materials

The expected raw material constraints center on trade and travel to several locations to acquire the variety of material needed and observed in the assemblage. No quarry sites are known in the immediately vicinity of the Punchaw Lake site, therefore logistical forays, perhaps combined with hunting or gathering trips would be required to collect raw lithic material. Given the proximity of the Nuxalk/Carrier Grease Trail, trade is anticipated to be a significant source of material. The analysis of the lithic assemblage, however, does not very align well with these expectations. This failure is primarily due to the lack of material sourcing studies in the central interior from which to develop expectations.

The accessibility and availability of stone with the qualities necessary for knapping and grinding tool forms is widely regarded to be a key component in technological organization (Bamforth 1986; Andrefsky 1994; Hayden *et al.* 1996). An overview shows that basaltic materials were by far the most common (Figure 80) at 79.7% of the total. The breakdown of materials as a percentage of each category reflects that basaltic material is the most common material in each category, with the exception of cortical spall tools which are made primarily of quartzite and groundstone items which are mainly of greenstone and other rocks such as slate and sandstone. Chert is used for 46.6% of the blade tools, much higher than the assemblage in total, which is only 4.0% chert. These observations will be discussed in greater detail.

Greenstone varieties represent only 0.7% of the total classified assemblage. Greenstones are durable, amorphous rocks such as, steatite, jade or nephrite and they are not known in the central interior (cf. Bourdon 2002). These stones are found along the coast however and in the northern mountains and could have been traded for. As mentioned above, greenstone is most commonly used for groundstone tool types.

Obsidian, at 1.6% of the assemblage, is slightly less rare than greenstone varieties. Fladmark's (1973) field notes source most of the obsidian to the Ilgachuz , Itcha and Rainbow (Anahim) sources and some Mt. Edziza examples. Itcha Mountain is within the asserted Nazko traditional territories and Peter Louis recalls that hunting parties travelled there in fall, to hunt for caribou (Quesnel and District Museum and Archives2008), while J. Morris Boyd also of the Nazko First Nation, recalls hunting caribou in March on Itcha Mountain (Personal Communication, December 11, 2009).

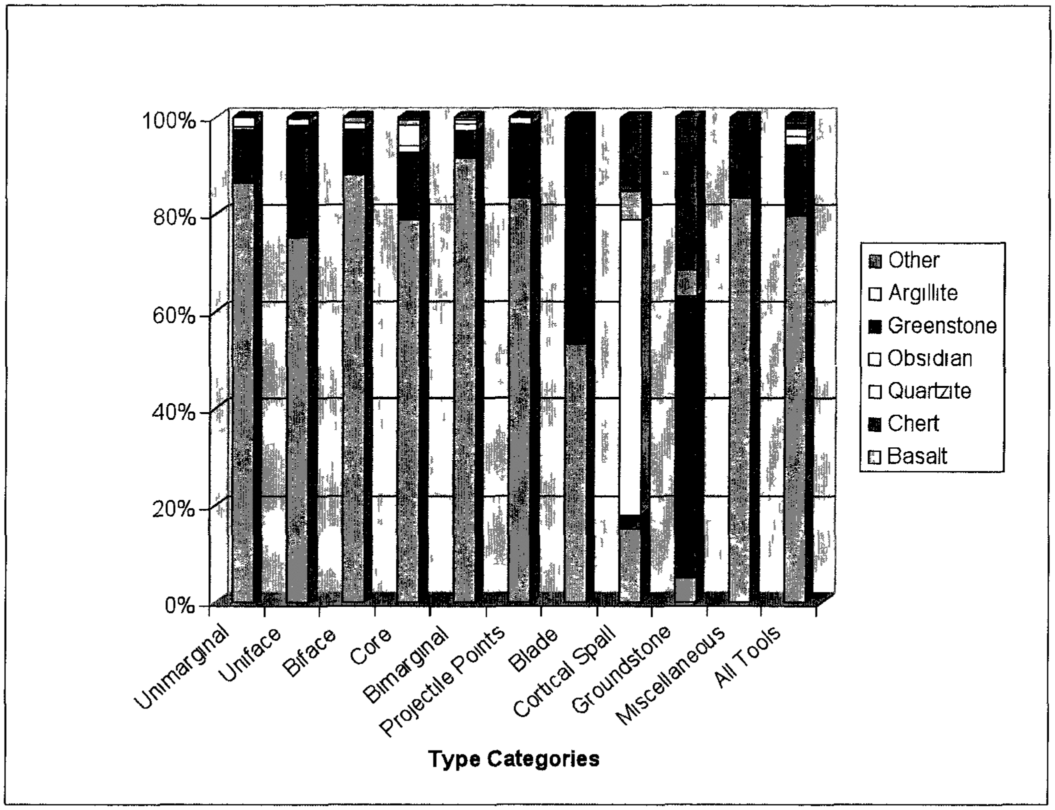

Figure 80: Raw materials as a percentage of the general type categories

Herbert Hance states that groups would camp at Anahim flats during fish spawning (Quesnel and District Museum and Archives 2008). Trade along the Grease Trail, as well as seasonal travel through these mountain ranges would have provided the chance to opportunistically collect obsidian. The average weight of the obsidian artifacts is 3.8g, most of these being exhausted cores and unimarginal flake tools. Given that there was opportunity to acquire obsidian, these very small amounts imply that the material was not actively sought out or quarried.

Quartzite is as rare in the collection as obsidian at 1.8% of the catalogued materials, but for quite different reasons. Given the amount of basaltic materials of varying quality that were available for tool making (see below), quartzite was only utilized for tools to which it is best suited. Approximately 74% of the quartzite tools are cortical spall scrapers and tchithos and there are fewer flakes (24) of the material recorded in the debitage than there are complete tools (27). Since quartzite cobbles of the appropriate size are readily available in the nearby river cobbles of the Blackwater River, this material could be sought and worked at the river when necessary and the subsequent tools then maintained as part of the mobile tool kit.

The cherts found at the Punchaw Lake site are generally smooth textured and fine grained. A wide variety of colour, lustre and opacity suggests that these materials were coming from a variety of locations. Since small outcroppings and agate gravels are known throughout the area (cf. Bourdon 2002) it is likely that these materials were being opportunistically collected during the seasonal round. Some locations may have been visited repeatedly, if they were accessible and associated with other desirable resources, such as berry patches. Chert may also have been acquired through trade to augment what could be collected or to acquire more exotic colourations or other qualities. Of the worked stone assemblage 14.5% is made of chert, making it the second most common material. While some chert examples can be found in most of the types classified, higher than average chert percentages in select types indicate that it is the preferred material for tools requiring sharper, thinner edges than basaltic material generally provides (Luedtke 1992). These chert primary tool types are all of the blade tool types (except microblades), key-shaped unifaces, unimarginally retouched unifaces, and awls. Drills, and pentagonal projectile points are also more commonly made of chert, perhaps because the very fine grained materials allowed for continued, reliable re-sharpening to maintain edges, however, this population is too small to make such assumptions. At 6.25g, the average weight of all the chert tools is noticeably smaller than the tool assemblage average of 14.3g. Cherts do not appear to have been quarried in any significant manner, as active quarrying of a source would tend to result in a more homogenous chert collection. The rare material was usually utilized carefully, where it was best suited to the job.

By far the most common raw material utilized at the Punchaw Lake site is basaltic stone, composing 79.6% of the tool assemblage. Basaltic materials are found throughout British Columbia, west of the Rocky Mountains, as common extrusive igneous rocks. The basaltic materials found at the Punchaw Lake site are of a wide variety of qualities from quite coarse andesitic-appearing material to more fine-grained dacite and trachydacite materials. Preliminary geochemical analysis indicates that most of these materials are dacite and trachydacite and suggests that the dacite and trachydacite at the Punchaw Lake site are from at least six different sources (Bruechert 2010).

The design theory expectations did not anticipate that the primary source for these basaltic materials would be river cobbles, but this seems to be the case. Rounded cobble cortex can be found on many of the tools, particularly the larger tool types and multidirectional and unidirectional cores. These cobbles are approximately fist sized with well weathered, smooth to pitted cortex. Cobbles comparable to these can be located in the gravel beds and banks along the Blackwater River, along with many other rivers in central and western British Columbia. Small basaltic outcroppings have also been observed by this author a few hundred meters north of the Punchaw Lake village site, on the shores of Punchaw Lake, making this material readily available when not snow covered. It is conjecture that these proposed sources were those frequented by the inhabitants of the Punchaw Lake village site; to date the actual sources have yet to be identified.

It is interesting that the expectation for a higher amount of raw materials brought in from trade along the Grease Trail does not appear to be accurate. Non-local materials such as obsidian, greenstone and unusual chert varieties are present, but in very small numbers. Future research is clearly need regarding trade routes and raw material sources in the central interior of British Columbia.

Technological Constraints

The expectations developed for technological constraints at the Punchaw Lake site focused on the wide variety of technologies necessary to maximize utilization seasonal resources. Tool specialization is known is this area, and is expected at a village site. Tools ranging from expedient to curated would allow the village inhabitants to most efficiently to manage a diversity of subsistence strategies. In the village portable tools kits would have to be prepared and stored in anticipation of logistical hunting and gathering forays.

Several technological strategies were being employed at the Punchaw Lake site, with no single dominant strategy (Table 5). Expedient flake tools, as represented by the unimarginal and bimarginal tool types, is the largest category with 33.4% of the non-debitage assemblage. Unifacially worked tools are quite similar to the marginal tools as a strategy, and it has been suggested that a minimal amount of time and energy would have been required to manufacture them (Hayden *et al.* 2000). Some are more involved than simple expedient flake tools, such as the key-shaped uniface (Rousseau 1992), while most require no more effort than marginal tool. They represent a smaller reduction strategy category with 23.8% of the assemblage. Bifacial reduction, including projectile points with the bifaces, also represents a significant strategy at 26.0%. Blade production, including microblades, blade blanks, blade tools, and blade cores, is a very specific technology. They make up only 4.3% of the assemblage, but they are significant as they represent a specialized technology. The bipolar technique, was known and used at the site (16 cores making up 1.1% of the total), but was not a major strategy. Groundstone tools are notable in that they are a very small component of the assemblage, only 1.3% of the total and almost all of those in damaged or fragmented condition.

Type Category	**Total**	**Percentage**
Projectile Points	138	9.4%
Bifaces	244	16.6%
Unifaces	306	20.9%
Unimarginal	346	23.8%
Bimarginal	141	9.6%
Blade Tools	58	4.0%
Cortical Spall Tools	33	2.3%
Groundstone	19	1.3%
Cores	166	11.3%
Miscellaneous	12	0.8%
Total	**1464**	**100.0%**

Table 5: Totals of type categories, and as a percentage of tool assemblage

Based on these numbers and the variety of tool forms represented (Table 5), the Punchaw Lake site assemblage is a complex one. Technologies that are considered as reflecting curation are well represented at the site in the numerous bifaces (Nelson 1991; Kelly 1988), such as projectile points. Blade technology may not have been a major strategy, but it is well represented and is also often considered a curated tool type due to the high degree of useful edge area to low weight ratio (Parry 1994:93). Blades are also a risky use of raw material as special skills are required to make them and failure rate can be high (Clark 1987; Hayden *et al.* 2000). Also likely to be curated are specialized tools with strict requirements of form and materials, some of which do not fall within the biface classification. These tools include key shaped unifaces, awls and combination tools such as awls with scraper ends and the tools in the Miscellaneous class that are made by combining different techniques to create unique forms. All of these could be kept and used as part of a portable tool kit as they could serve multiple tasks, were easy to resharpen and reuse, and/or were specifically made to be light and reliably complete necessary tasks with minimal risk of breakage. As such, curated technologies are associated with mobile subsistence patterns.

Expedient technologies are commonly associated with more sedentary settlement patterns, where stores of raw material meant conservation was less important and failure of the tool was inconsequential as another could be quickly and easily produced (Parry and Kelly 1987). These expedient tools are the most well represented strategy at the Punchaw Lake site, both the unimarginal and bimarginal tools are made on thin primary or secondary flakes, with minimal retouching along edges to create the use edge. Many of the unifacial tools are also expedient in nature, with minimal flaking and a lack of refining retouch to thin or straighten the edge, such as the backed uniface edges, most scraper types, and notches. These tools are quickly and easily made. The diversity of raw material and flake size type that were used suggests that both expedient flaking of cobble cores and selection from debitage of previous manufacturing could have been used in this technological strategy.

Sub-ovoid unifaces, gravers, key-shaped unifaces, and scrapers of various forms are plentiful in the collection, and represent another technological approach. These tool types are considered to have not required significant amounts of time to manufacture, as opposed to bifaces, or blades (Hayden *et al.* 2000; Rousseau 1992). However, they are have specific requirements as to size of flake blank and suitable raw material, limiting the number of expedient flakes that would suit, possibly requiring intentional core reduction to produce suitable bases. Many of these tools, such as the end scrapers, had further effort and time put into them to haft them and they were subsequently resharpened and maintained while hafted, indicated a long use life (Hayden *et al.* 2000:197). Cortical spall tools are a good example; they are simple unifacial tools, but they require a very particular coarse grained raw material, preferably quartzite, a standard size of cortical spall seems to be preferred, and they were hafted. Dorothy Nome clearly recalls her mother having such a tool, hafted, for continual reuse. Lucy Laurent, also of the Nazko First Nation, still has her mother's spall scraper (Personal Communication, November 20, 2009). Hafting requires several different materials beyond the stone tool itself, and takes some times and effort to produce and attach to the tool, increasing production costs of these types (Keeley 1982:800).

Socioeconomic Constraints

The logistical collector subsistence strategy employed by the Dakelh is central to the technological expectations of the Punchaw village site. A variety of technological strategies resulting in varied tool forms is expected to balance the different needs of a large group, living together in a village and smaller family units preparing to spend a season out on the land. Storage strategies are also expected as an economic means of relieving time pressures by preserving excess food, raw materials and tools.

The variety of tool types is consistent with that expected for a village site in the central interior. In terms of mobility, the Punchaw Lake assemblage is complex and can be defined as a continuum from highly portable and multipurpose sub-rectangular bifaces to the minimally modified, single edged, unimarginal flake tools. There does not seem to be any one strategy that dominates this assemblage. This may be the 'coarse-grained' assemblage of a location that is occupied throughout the year and encompassing numerous activities (Binford 1980:17). However, working from the ethnographic and environmental information and the history of the seasonal round as described in ethnographic reports and by the Nazko participants, it is the assemblage of a group that spends their time in the village both actively harvesting and processing the resources near the village and in preparing the tool kits that they will transport in the months out on the land. Time pressures created by the changing seasons and the resulting changes to the accessible resource base are mitigated by this variety of technologies.

Socioeconomic constraints are complicated and closely tied to the topics previously discussed. The wide variety of tasks indicated by this assemblage are the work necessary to support a large group living together for several months and travelling on the land for several months with the resources at hand. Tools for a variety of hunting, fishing and gathering activities are noted, as well as tools for processing these materials and making new tools. Although there is no evidence of salmon fishing at the site, as would have been expected, this evidence may be off-site from the village, close by the river side. The blade tools may be the evidence for such fishing, being found on site where they are made. Blades can be hafted along a wood or bone handle to create a fine-edged filleting knife (Wyatt 1970). The raw materials noted in the collection indicates most of the lithic materials could be sourced from locations near the village site, while some is sourced from logistical forays. The clearest example being the obsidian from Itcha Mountain, a location frequented by the Nazko Nation during hunting trips. The variety of technology reinforces this pattern, examples of tools and strategies ideal for portable tool kits and for more secure access to resources that may be collected and stored at a village site.

Storage is another key aspect of the seasonal round in the central interior and the analysis seems to support the expectation. The archaeological distribution of cultural features identified as cache pits and the extensive oral history of caching told by the Nazko Elders attests to the significance of this strategy. When resources are in abundance, such as fish in the rivers in the summer, the excess food is stored in locations across the landscape. These stores can then supplement the resource base during hunting forays, or for the return to the village, before the next fishing season. In terms of the lithics at the Punchaw Lake site, there is indirect evidence of storage, as noted in the discussion of task constraints; large groundstone wood working tools are not found in numbers expected for a village site and may well have been cached off-site, closer to the wood source.

There is minimal evidence of trade in the presence of small amounts of greenstone and obsidian from sources as distant as Mt. Edziza. Trade was not a defining aspect of the economics of the Punchaw Lake site, as these materials represent less than 2% of the collection. Certain cherts in the assemblage are exotic and could have been sourced through trade, but most are regionally sourced.

Artifact Distribution

The distribution of the finds is important to understanding the pattern of activities at the Punchaw Lake site. The two main areas of excavation at FiRs-1 were placed to completely excavate House 1 (H01) and most of House 2 (H02). A portion of H02 had been previously impacted by logging skid trail activity. Test squares were also placed in 3 other houses and in one storage pit, however focus here will be paid to the two most complete excavations and any apparent distinctions between the two main houses. House 1 is approximately three times larger than H02 and therefore it is not surprising that a much greater percentage of the tool total was found within it. Just over 70% of the finds were in H01 and 16.0% in H02. What is most significant about the distribution of tool types is that there are no noteworthy differences between them, as seen in Figure 81, where the broad tool categories are displayed as a percentage of the total of each feature. There are some minor differences; unifaces, blades and projectile points are slightly over-represented in H02, and cores in H01. The only conclusion that can be drawn is that while H01 may have been occupied by more people, or over a longer period of time, the types of activities occurring within the household do not differ in any definitive manner.

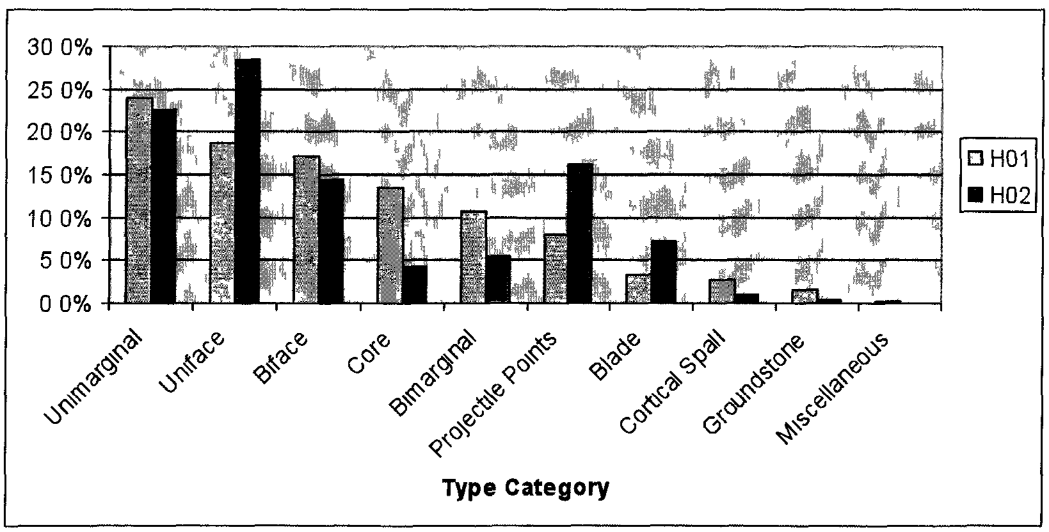

Figure 81: Type categories as a percentage of the features' totals

Discussions with the Nazko First Nation

The Punchaw Lake village site itself did not resonate strongly with the Elders of the Nazko First Nation. This does not mean that information, stories and memories of this site and this lake do not reside with other Nations. The Lheidli T'enneh Nation also claims this location within their area of traditional concern and the Saik'uz First Nation is a close neighbour with family ties to the Nazko Nation. However, none of the Nazko Elders consulted recalled a history of people living at that site or using that area. The nearest Ellie Peters could recall was travelling north to Graveyard Lake, well west of the Punchaw area (Interview, November 20, 2009). Morris Boyd made a geographically closer connection, remembering a large fishing camp on the Blackwater River, just near where it narrows to a rocky canyon (Interview, December 11, 2009). This canyon is likely the one that is approximately 18 kilometres south of Punchaw Lake at Blackwater Crossing, near two small reserve areas at Nazko cabin sites. J. Morris Boyd remembers using wooden fish traps in the river to catch the salmon, which would then be cached nearby and higher up, on the high ground at the top of the river valley. Gathering to fish the salmon run, which is ethnographically documented as a village occupation, is remembered as a group camping experience (Doreen Patrick, Interview, November 20, 2009; J. Morris Boyd, Interview, December 11, 2009). The people of Nazko and Kluskus used to gather on the Fraser River at Quesnel for the salmon.

Nazko and Kluskus are the two villages of the Nazko First Nation, and have been for some time. The stories of the founding of these villages are still told. Kluskus is apparently the older settlement and its location was chosen by an arrow shot into the air; the village was then built where the arrow landed (J. Morris Boyd, Interview, December 11, 2009). The location that would eventually become Nazko village was underwater at that time, and when the people moved south to start a new village they broke a beaver dam and released the floods, changing the terrain and revealing the site for the Nazko village (Doreen Patrick, Interview, November 20, 2009). Doreen suggests that something similar may have occurred at the Punchaw Lake site, that perhaps the terrain was different in the past and people moved as the environment dictated. While the location of the Punchaw Lake site does not hold significance any longer, it is clear from these stories that the founding of a village is an important event for the Nazko Nation.

Stone tools also have real significance and connection for the Nazko Elders and their interpretations on function are not unlike the archaeological categories. Given that metal tools began replacing stone before the end of the eighteenth century (Tobey 1981; Furniss 1995), it is important that some are still being passed down through family lines, and there is memory of stone tool manufacture into the last century (Lucy Laurent, Interview, November 20, 2009). The Elders were very interested in seeing and feeling the Punchaw Lake site artifacts. Some of the memories that the tools inspired were related to direct experience with these tools, particularly the cortical spall tools and the arrowheads. Other interpretations of the tools were more intuitive, such as Doreen Patrick's identification of the thin, unimarginal tools as being possibly for cutting bark for stripping the tree and scraping the sap (Interview, November 20, 2009).

Gender association with certain tools could also be seen in the affinity some of the Elders had for certain forms. The women seemed to take particular interest in the tools recognized as having been used for hide preparation and sewing, such as the scrapers and the awls. They discussed how they could still use these same tools as they prepare hide to make leather for moccasins. J. Morris Boyd also had memories of hide scraping with spall tools, but the arrowheads in particular sparked many stories. These tools evoked stories of a time when the Nazko people were at war with their neighbours. The hand-axe was also a weapon as well as a tool, it would have been hafted and used in fighting (Interview, December 11, 2009). Discussion of the stone tools also brought up stories of tools made of other materials, wood traps for fishing and moose antler for sap scraping (J. Morris Boyd, Doreen Patrick, Interview, December 11, 2009).

Beyond the practical level of discussing the tools themselves, the process brought forth other stories, some inspired by the tools while others came out simply as part of discussing the past. Using cache pits to store food across the landscape was one of the most often raised subjects during the interviews. Perhaps it is the pit's continued physical presence, where they are often seen during travels on the land, keeping these memories alive. This use of the physical evidence of the past to raise memories and inspire the Elders to share their stories was one successful element of this project. While the stories it brought out were often not directly related to the tools themselves, and therefore difficult to weave into the scientific analysis of the tool assemblage, it is nonetheless significant to have these stories documented. Many of the Elders who knew the histories have passed on, it is important to gather what is still remembered and record it for future generations (Doreen Patrick, Interview, November 20, 2009).

Many of the stories, however, can be related to the scientific analysis of the stone tools assemblage. In the above analysis one of the key issues is the mobility of the group. The Nazko Elders referred often to the use of cache pits to store food, often fish. These features are found throughout the asserted territory of the Nation and the area of Punchaw Lake, supporting the story of a highly mobile people, using the cached foods to support journeys across a large territory. More direct are the stories of travelling these great distances. J. Morris Boyd recalls hunting expeditions to Itcha Mountain, far to the west

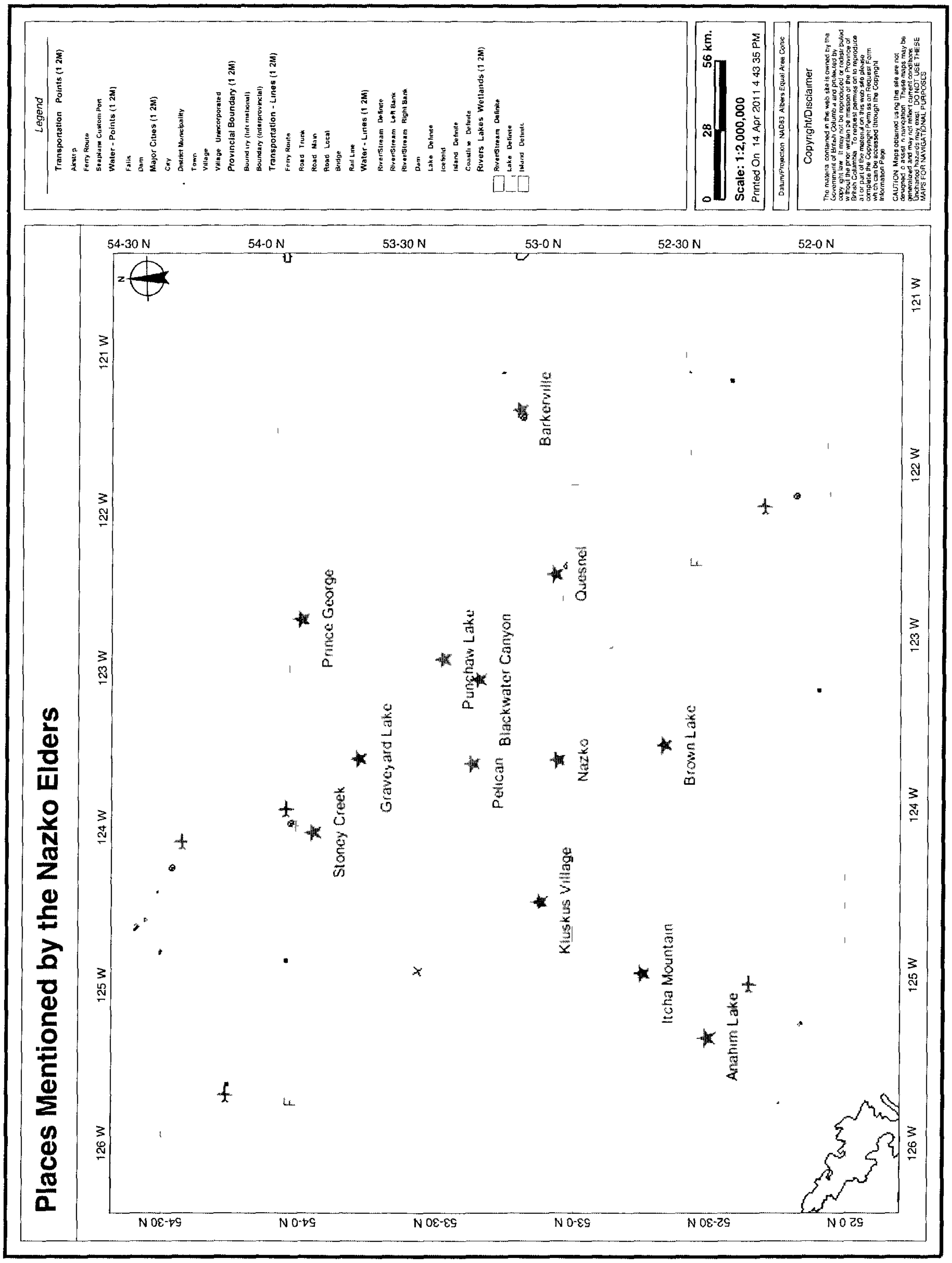

Figure 82: Places of significance mentioned by the Nazko Elders. Copyright 2011, by the Government of British Columbia. Electronic document, https://webmaps.gov.bc.ca/imfs/imf.jsp?site=libc_ilrr. Reproduced with permission.

of the Nazko village, in the early spring (December 10, 2009). Fishing camps are remembered along the Blackwater River and at the Fraser near Quesnel (Doreen Patrick and J. Morris Boyd, Interview, December 10, 2009). For berry picking, the traditional grounds near Barkerville are still visited to in August (Doreen Patrick, Interview, November 20, 2009). Some families travelled as far north as Graveyard Lake as there was intermarriage with the Saik'uz First Nation, whose village is at Stoney Creek, just south of Vanderhoof (Ellie Peters, Interview, November 20, 2009). As Doreen Patrick puts it, "People used to go all over the place, a long time ago." (Interview, December 10, 2009). The locations that were identified as significant were mapped along with some other significant location to illustrate the territory involved and the distances covered (Figure 82).

The stories of the Elders on the Nazko First Nation are both from their own memories and those passed to them from generations past. They brought both remembered meaning and intuitive responses to the stone tools that were presented to them. Where the memories are tied to a specific tool form, the information has been presented as part of the description of that tool. Where they are descriptive of ways of life in the past, the information has been integral in understanding the constraints on the tool makers at the Punchaw Lake village, and in interpreting the organization of the technologies. Also presented here is a discussion of the stories themselves, outside of the framework of the scientific analysis, but as they relate to the understanding of the history of the Nazko First Nation. These oral traditions give a indication of a highly mobile people, who have strong ties to their villages. They know this assemblage as artefacts of their past, both as practical tools and as family treasures. Where the practical information can inform the archaeological study, it is a valuable source that strengthens the evidence. Beyond this the information can only be respectfully presented as it enhances this picture of the past, and personalizes it. The theory and methods for truly incorporating an indigenous perspective based on oral traditions as applied to an archaeological context have not yet been established.

Summary of Discussion

In summary, the tool assemblage from the Punchaw Lake village site, FiRs-1, is both rich and diverse. A wide variety of technological approaches to tool manufacture can be observed, that represent a range of strategies from curated to expedient. In this usage the term curated is intended to be used in opposition to expedient, meaning considerable time and effort were put into manufacture and these tools were likely maintained, probably transported, and had a long use life. These strategies are part of a continuum, as demonstrated by tools such as hafted unifaces which do not fall into either category easily. Further, though the exact raw material sources exploited by the people of the Punchaw village are unknown, the quantities of basaltic materials, evidence of tool manufacture on site, and numerous expedient tools indicate that access to basaltic materials of reasonable quality was not a problem. As expected, the technological strategy at the site is a varied approach, seeming in concert with a people whose seasonal round included periods of settled village life and with extensive travelling to specific resource locations. The members of the Nazko First Nation who participated in this project tell of long journeys of over 150 kilometres to the east to the Barkerville area to collect berries in the summer (Doreen Patrick; Interview, November 20, 2009). They also describe journeys of over 100 kilometres to the west to Itcha Mountain in the early spring to hunt caribou in the highlands (J. Morris Boyd, Interview, December 11, 2009). Ellie Peter's tells her mother's story of travelling over 100 kilometres to the north, to Graveyard Lake, "They travelled everywhere and they camped anywhere" (Ellie Peters, Interview, November 20, 2009). There were journeys to the Fraser River at Quesnel for salmon fishing and trap lines at Pelican Lake (Doreen Patrick; Interview November 20, 2009). For the Nazko people the village was an important central location, one that was returned to again and again, where all the families of the Nation could gather together.

CHAPTER 5 - CONCLUSIONS

"Our translation for history is about a sentence. There's not just one word. It would translate as 'How our people survived long time ago'. That would be the history." Doreen Patrick, Nazko First Nation (Quesnel and District Museum and Archives 2008).

The Nazko First Nation finds their history in their traditional way of life. Archaeologists are looking for the same history; to understand how people lived here long ago. In this we can hope to find common ground and work together. The Nazko have knowledge of their history that can put a human face on the past, bring a reality to it. As archaeologists we can gain new perspectives by listening to their stories, and by sharing our knowledge with them in turn, we will achieve a greater whole (Nicholas and Andrews 1997:6). In this research the contributions of the Nazko First Nation have been placed alongside the archaeological interpretations. Their views and insights have been woven into the study, combined with all the other information gathered as part of a whole. The intended result is a coherent incorporation of all the relevant perspectives and a clearer picture of the Punchaw Lake village site as a place at home within the seasonal round.

It can be challenging to design a research project that effectively incorporates First Nations ways of knowing with the Western traditions of archaeological research, as these are two different ways of thinking and describing, one more qualitative and one quantitative (Thorly 2002; Mason 2000). This project has attempted to work with oral histories to enhance the archaeological approach, as a strong and significant line of evidence that supports and augments the arguments, as has been proposed by some researchers as one way to include this type of information (Anyon, *et. al.* 1997; Echo-Hawk 2000). In many ways this has worked, the interpretations of several of the tool types is directly informed by the Nazko Elders responses to the artifacts and the anticipated constraints on the design of the tools and the interpretation and discussion of the patterns of technological organization is partly based on their stories of ways of life in the past. However, this does not address all the needs of the Nazko First Nation or the other Nations who are concerned with the Punchaw Lake area, the Lheidli T'enneh Nation and neighbouring Saik'uz First Nation. To improve archaeological research, there is still a need for a body of theory and methods that will integrate oral tradition in archaeological analysis, and will allow the First Nations individuals to take a more central role (Yellowhorn 2002). There are paths to a more an inclusive archaeology that are tied to self-determination, community based action, and achieving greater involvement of First Nations individuals in forming their own theories and methodologies (Smith 1999). Taking this into consideration we can still move ahead with some conclusions regarding the lithic assemblage at the Punchaw Lake village site.

The exercise of developing expectations based on the design theory and established background information of the site and the people who lived there was moderately successful. Predictably, the more detailed the available background information for a specific concern, or constraint, the closer the alignment between expectations and findings. As a result, using the expectations as a model to compare with the analysis was most successful at highlighting the areas where more research is required. In this case, the expected evidence of trade was not found in the assemblage, indicating that more research is required. Sourcing studies and further excavations at the site in different areas may help to clarify this issue.

The use of design theory and expected evidence of different types of constraints also helps to describe and define the diverse assemblage of a village site, organizing the analysis. Thus, the Punchaw Lake site lithic assemblage can be seen to represent a complex of technological solutions to the problems presented by a resource base heavily influenced by seasonal change. The seasonal round is the Dakelh strategy to accommodate the contrasting needs of village life and of leaving the village for long periods of travel to access resources. This strategy has resulted in a particular diverse set of tools. The dramatic seasonal changes of the central interior of British Columbia necessitate a broad subsistence strategy, designed to maximize acquisition of resources available in different places at the different times. The seasonal round of the Dakelh people is an important part of the oral tradition of the Elders of the Nazko First Nation. Many stories describe the entire community taking part in sedentary village life and in spreading out on far reaching forays, requiring a diverse and rich tool kit (Goldman 1940; Morice 1893; Tobey 1981). A complicated technological system developed to best support the vastly different needs of both a large, semi-sedentary group and the small, highly mobile groups.

The task constraints of life in the village would be broad, and the wide variety of tools noted at the Punchaw Lake site support this. Tools that are ideal for the work of meat processing, hide processing, gathering and processing vegetal material for food, basketry, and structural maintenance, fishing, development of tool kits for hunting, trapping, and fighting wars are all present in the assemblage. Tasks that seem not to have been significantly engaged in include large construction and wood working projects such as building structures as indicated by very few, and fragmentary axes, chisels and adzes. Although, as previously stated, this could be a result of such a small portion of the site being sampled and such tools could be located elsewhere on the site. After the initial construction of the village for a period of occupation, continual use of the site structures would have only needed maintenance. Large wood working tools may therefore have been recycled and used as raw material to make different tools after construction was completed and the wood working tools were no longer needed. The village inhabitants may have had to travel great distances to acquire sufficient amounts of quality wood. Caching the large heavy tools such as mauls out on the land, nearer to the wood source, would explain their absence in the village. Possibly these tools are located elsewhere on the site.

The analysis of raw material utilization on the site suggests that the inhabitants of the Punchaw Lake village site had reliable access to middle and high quality basaltic material, and varied to limited access to a variety of other important lithic materials. Although the exact sources are not known, basaltic materials were being brought to the site in the form of river cobbles. The variety represented indicates that cobbles were being brought in from several locations, probably by including trips to sources on the routes selected for returning from hunting and gathering forays. Directed forays to gather materials from nearby sources could also have supplemented the stores of raw materials. Some of the chert was probably collected opportunistically during travels, but the sheer variety of types suggests that some of it was brought from much further afield by trade networks. The very small amounts of obsidian were obtained in the same manner. The Ilgachuz and Anahim ranges were part of the spring and early summer hunting and fishing foray (Doreen Patrick and J. Morris Boyd, Interview, December 11, 2009), however the samples from the Mount Edziza area were likely acquired through trading. Perhaps one of the most interesting conclusions that may be drawn from the raw materials identified in this collection is that trade does not appear to have been significant. Only 1.4% of the tools are obsidian, while greenstone only accounts for 0.9% of the tool assemblage, and argillite is only 0.5%. Despite being on a major trade route with the coast, trade in lithic materials does not seem to have been important, however this conclusion must also be tempered by the low percentage of site excavated.

The presence of all stages of lithic reduction on the site, from raw basaltic cobbles to refined, extensively worked pieces and the wide variety of technological strategies indicates a complex site. Specialized technologies such as blade production were present and many specialized tools such as key-shaped unifaces, awls, drills, projectile points in a variety of style and unique miscellaneous tools such as the multi-edge biface (Figure 32). This suggests there was a possibility of developing, skilled craftsmen who had the time, materials and energy to engage in the manufacture of many varied tools (Parry and Kelly 1987; Hayden *et al* 1996:24). Village life could have afforded the opportunity for more time and materials to be used in training, to pass on the knapping skills, although there is no clear evidence in this collection that this was occurring. The extensive use of expedient techniques suggests that raw material was being maximized by making use of debitage. While many consider expedient technologies to be an indication of minimal constraint and an abundance of raw material, it may also be true that they are a realistic way to fully exploit the material by using as much of the by-product and debitage flakes as possible. Almost all of the cores in the assemblage were exhausted, confirming a tendency to maximize the resources available. This is consistent with the village site being the base for building the portable, reliable tools for future resource expeditions, while tools with a much shorter use life were being scavenged from the debitage. This broad based strategy would enable village inhabitants to be prepared not only for specific events such as the salmon run and the fall rut, but also exploit any opportunities that may present themselves. Under normal conditions, the risk of failure was low in the village, although a low salmon run would be a serious threat. Regardless, the people of the Punchaw Lake village were preparing themselves for long travels where risk of failure could be very high.

Food caching was another strategy that was used to reduce the level of risk during the resource collection forays. This common strategy is known ethnographically (Morice 1893) and archaeologically by the numerous smaller cache pits at FiRs-1 and the surrounding area (Blacklaws 1979, 1980; Canuel 2000; Montgomery 1979; Richards and Rousseau 1987). The village was a location that was returned to year after year and was occupied for a long period of time, allowing accumulation of tools. The Elders of the Nazko First Nation returned often to this topic, Ellie Peters and her mother remember travelling everywhere, and finding cache pits all across the Nazko traditional territory (Interview, November 20, 2009). J. Morris Boyd also remembers cache pits scattered across the landscape, primarily for storing dried fish, spring salmon, where it would still be edible a year later (Interview, December 11, 2009). Torrence (1989) has postulated that as the risk of failure is diminished a less diverse and less formal tool kit will be produced. By this logic, although activities such as caching would have reduced risk during logistical forays, the diverse lithic technologies of the Punchaw Lake site indicate that this was still a higher risk situation.

The lithic assemblage in total is reasonably diverse and not unexpected at a large village site. The season of more sedentary village life, if the salmon run proved reliable, would allow for a period of time with consistent food resources creating a period of time with less risk of failure. This could create the possibility of time and resources for development and use of a variety of tools and technologies needed for the variety of tasks that occur in and around the lodges. At the same time, expedient technologies are a key strategy as may be expected with an increase in sedentism (Parry and Kelly 1987). At the same time, food caching across the landscape and the reliable, maintainable tools in the collection are evidence of the highly mobile aspect of the logistical collector. These types of tools found in the village site probably represent a 'gearing up' in preparation for future bouts of intensive resource collection (Bleed 1986).

The technological strategies indentified in the Punchaw Lake assemblage with regards to ideological and prestige items can also provide insight into the lives of the village inhabitants. Only one item stands out as potentially not being a strictly or primarily functional tool; a lone, fragmented, decorated carving or effigy (Figure 68). The actual purpose of this piece cannot be guessed, but it may have had spiritual significance, or may have been a prestige item belonging to a person of higher status or a prominent family. However, the lack of greenstone and groundstone, the comparatively equal distribution of tools types by house, and the near complete lack of obvious status items suggests that no distinct division in class can be observed at this juncture. This compares well with what is ethnographically known of the southern Dakelh's social hierarchy. Although headmen existed as leaders of family groups, they were more organizers and arbiters than chiefs and operated at the good will of the group (Furniss 1995:526-527). Southern Dakelh groups were egalitarian and non-hierarchical; everything that was killed was shared equally with the entire group (Peter Louis, Quesnel and District Museum and Archives 2008). Every member of the family worked together, and when trout were pulled from Brown Lake, the children were taught to gut the fish and to donate them to the potlatch so they would learn how to share, how to contribute (Doreen Patrick, Quesnel and District Museum and Archives 2008). To be cautious, the small sample hinders any solid conclusions on this front. However, the two houses selected for complete excavation were different sizes and in different areas of the site. House 1 was much larger and appeared to be at the heart of a cluster of features and related houses; it seems to be the heart of the site. This does present the possibility that it was a communal structure and not residential, however there is little difference between the assemblages from each structure indicating that there is not significant differences between the two buildings (Figure 80).

Sharing and receiving knowledge of the artifacts with the Nazko First Nation brought valuable information and perspective to this research. Working together to improve archaeological practice and make it more answerable to the community is an important step. In a later communication with Doreen Patrick, she discussed how she views this project helping the Nazko Nation; with knowledge of this collection and the Punchaw Lake site, the Elders of the Nazko First Nation have seen it as a way to preserve their traditions and a way to use archaeology to educate younger generations about their history (Personal communication, October 12, 2010). They would like to see artifacts used in the schools to teach of their culture. This village within their traditional territory is of great importance as a place where there is an opportunity to educate and inform the public about First Nations. These kinds of initiatives might help to encourage more community members to become involved in archaeology and perhaps consider it as a career , allowing the Nation to help address the need for decolonized methodologies. Doreen suggests that it is not so important exactly which Nation is being consulted or represented in the archaeological practice, as long as First Nations are more involved in archaeological work. She believes that oral tradition works well alongside archaeology and that both ways of knowing are of great importance to her people.

In summary, the formal and standardized tools and range of bifaces may represent a reliable and maintainable aspect of this tool kit (Eerkens 1998; Bleed 1986; Nelson 1991; Kelly 1988). This is a technological response to the high mobility and risky resource strategies of the seasonal collecting forays (Torrence 1989). The quickly changing seasons and the pursuit of resources that are restricted to specific times and places meant that time pressures would quite high. The sheer diversity of the tool types and the use of expedient strategies at the same time are indicators of the more low risk aspects of the summer village life (Shott 1986; Ammerman and Feldman 1974). In the view of Parry and Kelly (1986), these two strategies are exclusive; formal bifaces are curated strategies of highly mobile people and will be seen to decrease in presence as sedentism increases and expedient technologies come to the fore. The reality that this proposition ignores is that of the central interior of British Columbia where a tool kit incorporating all available technologies in a system of specialized logistical collection became the best solution to surviving in a temperate land of dispersed resources, running on a seasonal clock.

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