5.0 DISCUSSION OF LITTLE BEAVER WATERSHED ARCHEOLOGY

5.1 Cultural Chronology of the Little Beaver Area

The long pre-contact period of the Northwest Coast's indigenous history has been summarized and described by archeologists through the creation of a sequence of cultural-historical periods within a defined geographic area. The time span assigned to each period relies primarily on extensive use of radiocarbon dates from archeological sites. Cultural histories of this type are inferred from analysis of thousands of diagnostic artifacts, archeological site features, geologic contexts, and other characteristics deemed relevant to explaining patterns in the archeological record. Figure 18 shows both regional and local cultural chronologies for selected locations in the Northwest Coast. Cultural histories are based on decades of archeological research at many sites.

	Time Scale in Thousands of Years Before Present[1]														
	13	12	11	10	9	8	7	6	5	4	3	2	1	0.5	Present→
Chronology/Period															
General Chronology[2]	Paleoindian			Archaic				Early Pacific			Middle Pacific			Late Pacific	
Strait of Georgia[2]					Old Cordilleran/Olcott			St. Mungo			Lacarno Beach	Marpole		Gulf of Georgia	
Fraser River Canyon[3]		? Pasika			Milliken		Mazama	Eayem			Baldwin	Skamel	Emery	Esilao	
Little Beaver Watershed Time Markers[4]							♦	6,540		3,840			1,360	St. Helens W ♦	

[1]Time scale based on radiocarbon dated archeological assemblages; *note that scale is not in even increments*

[2]From Ames and Maschner (1999)

[3]From Haley (1996) and Mitchell and Pokotylo (1996)

[4]Time markers consist of three radiocarbon dates and one identified tephra layer, as reported in text

♦Designates a time-sensitive (diagnostic) artifact type

Figure 18. Regional and local chronological/cultural periods of the Northwest Coast culture area compared with time markers derived from the Little Beaver watershed.

For this reason, direct comparison of these schemes with the project area is problematic, reflecting the comparatively limited extent of archeological investigations in the mountains. Even so, by plotting the project area time markers against these chronologies, the Little Beaver sites are considered within the larger regional view of cultural developments. The time markers are shown along the bottom row, and consist of the two diagnostic tools illustrated in Figs. 7 and 8, the three radiocarbon dates reported in Table 9, and the single volcanic ash identified in section 4.5. As shown in Figure 18, the Little Beaver sites cover a long span of the archeological history of the Northwest Coast. Although the Little Beaver dates suggest intermittent use of the watershed, this likely reflects a sampling bias introduced by the small number of sites and dated assemblages.

The earliest dates from the Little Beaver fall within the "Archaic" of Ames and Maschner (1999), a poorly understood period characterized by extensive environmental changes and the

development of early subsistence economies that preceded the rise of permanent settlements, resource intensification, and complex social organizations. Indigenous use of the North Cascades at this period is reflective of small mobile bands of people who subsisted by utilizing a wide array of local plant and animal resources from terrestrial and riverine environments (Mierendorf 1986). A partial dependence on terrestrial mammals in this period is revealed at the Glenrose Cannery Site, located near the mouth of the Fraser River. Here, Matson (1996) recovered bones predominately of elk and deer, in association with leaf-shaped (Olcott) points that are morphologically identical to the one from 45WH631 (Figure 7). He argued that this assemblage represents a seasonal occupation within a land mammal adaptation (Matson 1996:122). Somewhat closer to the project area is the Milliken Site, located in the Fraser River canyon, where leaf-shaped points were recovered in association with a distinctive river-cobble flaking technology. This site is also believed to be hunting related (Mitchell and Pokotylo 1996).

The other time markers from the project area fall within the "Pacific" period of Ames and Maschner (1999). Indigenous populations of this period developed several characteristics not seen previously, including economies oriented toward the intensive use of local subsistence resources; a dependence on food storage; complex stone, bone, wood, and fiber technologies; large houses and villages; warfare and social stratification; a highly-developed artistic expression; funerary rituals; and a peak in total population. Although little is known about this period in the Fraser River canyon, assemblages are characterized by chipped stone and ground tools, including microblades in the Early and Middle Pacific, and by the absence of microblade technology in the Late Pacific (Ames and Maschner 1999). Northwest Coast culture in much of this period, particularly in the Late Pacific, was nearly identical to the cultures observed and described by European visitors at the beginning of the contact period.

Given that the indigenous groups that traveled through and utilized the Little Beaver watershed spanned these cultural developments, one might expect that its archeological sites should also reflect these broader regional patterns, such as has been predicted for some high elevation landscapes in the North Cascades (Mierendorf 1999). At the same time, it is necessary to be aware that the general schemes of Ames and Maschner (1999), and others, are biased toward the saltwater margins of the Northwest Coast, and to a lesser degree, the lowland, riverine interior. If true understanding of the mountainous interior is to be achieved, it must derive from an independent empirical data base from interior mountain archeological assemblages, rather than from the lowlands.

5.2 Archeological Assemblages

Two overall patterns of tool stone use are shown in the site assemblages. The first relates to local tool stone procurement and primary reduction of lithic raw materials: the pre-contact equivalent of a mining-and-refining industry that supplies material to other stone tool technologies. Five of the eight sites inventoried in the Little Beaver watershed (Table 4) exhibit evidence that tool stone in the site had been gathered from local sources.

Additionally, based on excavation results from 45WH220 and -224, and on the surface assemblages described in Table 5 from 45WH220, -446, 447, and -663, it is possible to

derive a characteristic "signature" of these mining and refining activities, as defined by morphological categories of artifact types. This characteristic assemblage is defined by the dominance of four artifact morphological categories and the presence of at least one feature type. The categories include primary flake, broken flake, shatter, early-stage biface, and hammerstone. Intact bedrock formations exhibiting evidence of flaking and cultural fragmentation define the feature type. The diversity (richness) of tool stone types in these assemblages mirrors the diversity of tool stone types within the local bedrock formations, which is generally low.

The second overall pattern relates to the transport, repair, and reuse of finished tools. This assemblage pattern is characterized by morphological categories that include tool (and tool fragment), biface-thinning flake, and pressure flake. Diversity of tool stone types is greater than exhibited by local bedrock formations, and some types are derived from distant source areas. Only site 45WH631 revealed this pattern clearly, and 45WH220 to a slight degree.

Although the sample of Little Beaver sites is small, artifact assemblages suggest different flaking technologies applied to each of the two main tool stone types. The biface production technology on Hozomeen chert leaves morphologically distinct artifact categories compared with those produced by bipolar reduction of the small Hannegan vitrophyre nodules. The Hozomeen chert biface technology is well represented in the upper Skagit River valley sites. Bifaces are highly portable and were exported to other valleys far beyond the geographic provenance of Hozomeen chert tool stone. Exportation occurred in one or both of two ways, 1) through either transmontane transport along exchange routes, and 2) by subsistence and traveling parties who utilized the local chert to reprovision expended parts of tool kits during subsistence forays. During the eight millennia that Hozomeen chert was used, some indigenous groups in and around the northern Cascades must have known of this distinctive tool stone, or heard stories of its quarries, and many are likely to have seen or utilized tools made of this northern Cascades resource.

A technological analysis of all vitrophyre in park site assemblages does not yet exist; however, the recurring abundance of broken flakes, shatter, and split and shattered nodules of vitrophyre, along with an absence of biface tools and thinning flakes, suggests a reliance on bi-polar techniques for reduction and flake production. This technique is particularly useful when reducing small tool stone nodules or fragments. Although I have yet to see finished tools made of this vitrophyre, even small pieces offer extremely sharp cutting edges. Glass fragments would serve as bits for wood and soft-stone carving, as was practiced by many Northwest Coast people, particularly the Stó:lō (Smith 1988).

5.3 The Geography of Tool Stone

The geography of tool stone sources forms the basis for inferring group movements and subsistence activities in the project area. The data reported here reveal that these source areas constitute an important component of the subsistence resource base. The procurement and incorporation of local tool stone into the tool kits of the mountain-dwelling bands has been an important aspect of their subsistence pursuits for millennia. With the aid of accurate artifact-to-source correlations, the linkage among dispersed mountain sites with identifiable

tool stone sources presents an opportunity to infer exchange and subsistence routes within the Little Beaver watershed.

Figure 19 maps the generalized source areas for the three types of tool stone, identifiable to a high confidence level, found in the Little Beaver archeological sites. The types are Hozomeen chert, and two geochemically distinct types of Hannegan vitrophyre, Copper Ridge sources A and B. The data used to prepare this map derives from decades of field mapping, description, and analysis of rock formations by professional geologists. Archeologists are dependent on geologic maps to identify potential sources of tool stone, but following the procedure adopted in this study, the assignment of the term "tool stone" is an inference based on empirical (i.e. archeological) evidence of its use, rather than on assessments of the potential utility based on the attributes of the material alone. This empirical requirement commits investigators of tool stone sources in rugged, montane environments to a long-term research effort. Anything short of this level of commitment will fail to achieve the extent of indigenous knowledge of localized tool stone sources or to successfully apply the full range of techniques required for successful artifact-to-source correlations.

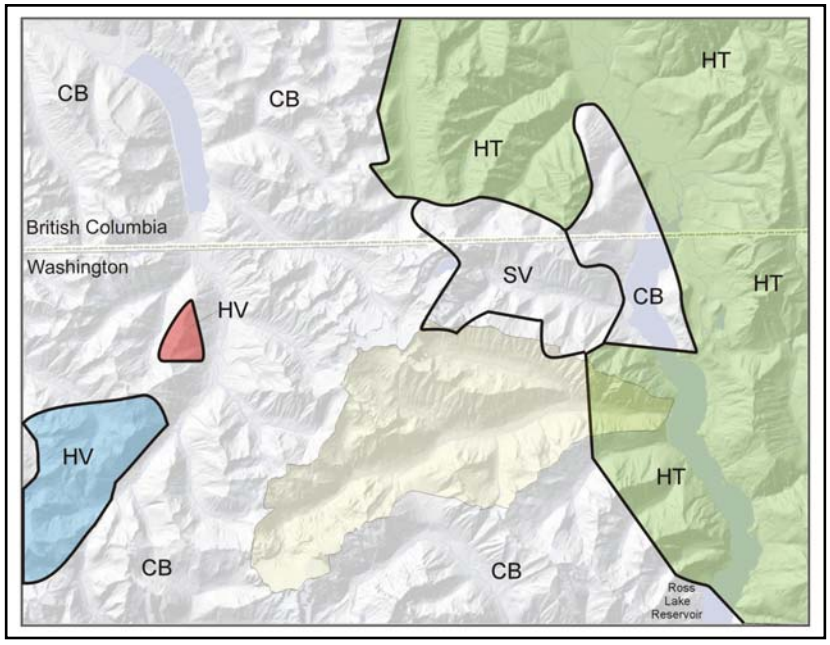

Figure 19. Tool stone source areas in the project vicinity; green is Hozomeen chert; red is Copper Ridge source B; blue is Copper Ridge source A; yellow is Little Beaver watershed.

Hozomeen chert tool stone is only locally available in outcrops and in the glacial and alluvial gravels eroded from them; such sources are restricted to the eastern end of the Little Beaver watershed (Figure 19). Vitrophyre sources in the Hannegan volcanic rocks occur some distance west of the watershed.

Figure 20 plots archeological sites in the project area, color-coded to reflect assemblages dominated by Hozomeen chert. This map forms the basis for the inferred dispersal routes of Hozomeen chert shown in Figures 21.

Based on the site and tool stone geographic data, Figure 21 shows the inferred route by which Hozomeen chert was transported through the project area. This is not necessarily the only such route; however, because others might exist that are not accounted for due to the absence of comparable data over much of the northern Cascades. Until the geographic

provenance of all Hozomeen chert tool stone sources is defined, inferences about anthropogenic routes of transportation must be treated with caution. Lacking the necessary data, a route is not shown in the Chilliwack Valley connecting with site DgRi-2, because there remains the possibility that this chert was brought along other transportation routes that may link more directly to Hozomeen Chert outcrops east of the divide separating Chilliwack Lake from the upper Skagit River valley.

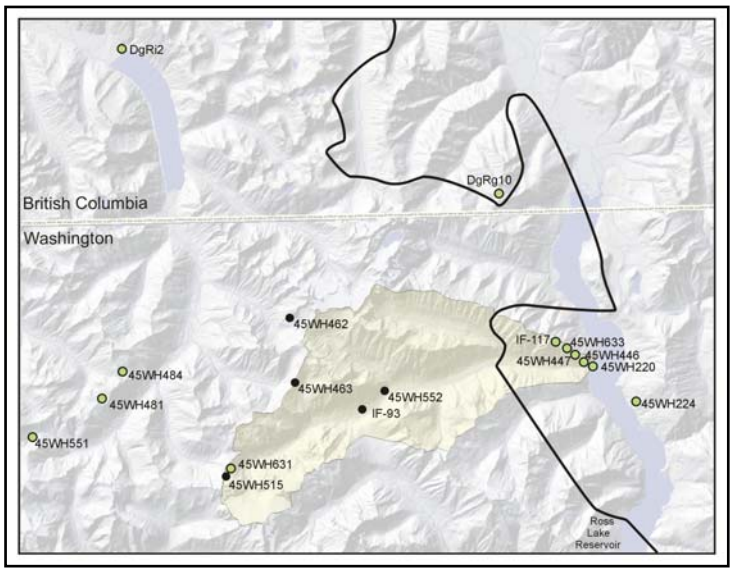

Figure 20. Map plotting assemblages containing Hozomeen chert in green; black dot means Hozomeen chert is absent.

Based on geochemical characterization of vitrophyre tool stone from source outcrops and archeological site locations (see Figure 16), a similar map of inferred transportation and subsistence routes is shown in Figure 22. As with Figure 21, the full geographic provenance of the Hannegan volcanic tool stone sources remains unknown, as the XRF data reveal that other geochemically distinct, but as yet undocumented sources exist. This also means that more routes are likely to exist than can be inferred from present data. Nevertheless, it is clear that vitrophyre from Copper Ridge geochemical source B is present in archeological assemblages in the upper Chilliwack watershed, and that this tool stone was carried, possibly along the transportation routes shown, to the Chilliwack and Little Beaver divide.

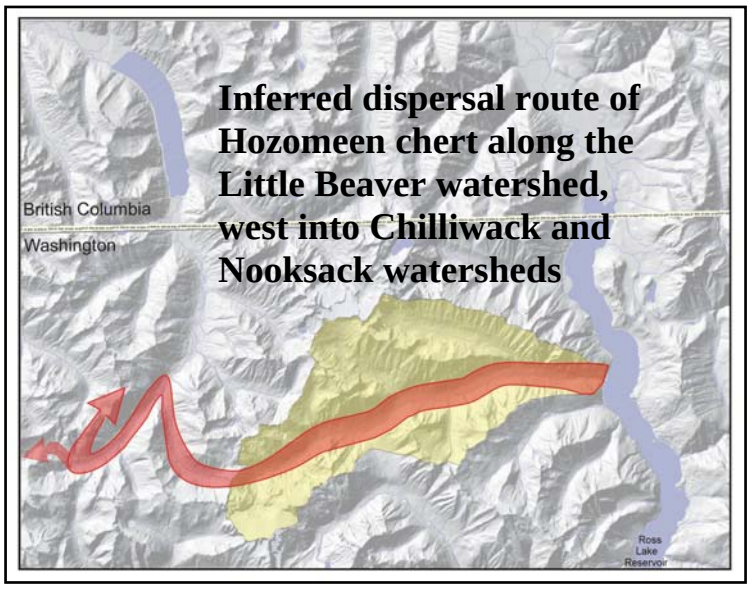

Figure 21. Map showing inferred dispersal route of Hozomeen chert from the upper Skagit watershed west to the Chilliwack and Nooksack watersheds.

These inferred routes of tool stone transport suggest that Hozomeen chert was carried to, and discarded at sites located well to the west and northwest of its source area in the Ross Lake area. However, a comparable movement of Hannegan vitrophyre to the east, down Little Beaver valley, is not indicated by the data. Given the

present state of knowledge, it appears that Hozomeen chert use was more widespread in archeological sites of the northern Cascades than Hannegan vitrophyre.

5.4 Site Geography and the Demography of Travel Groups

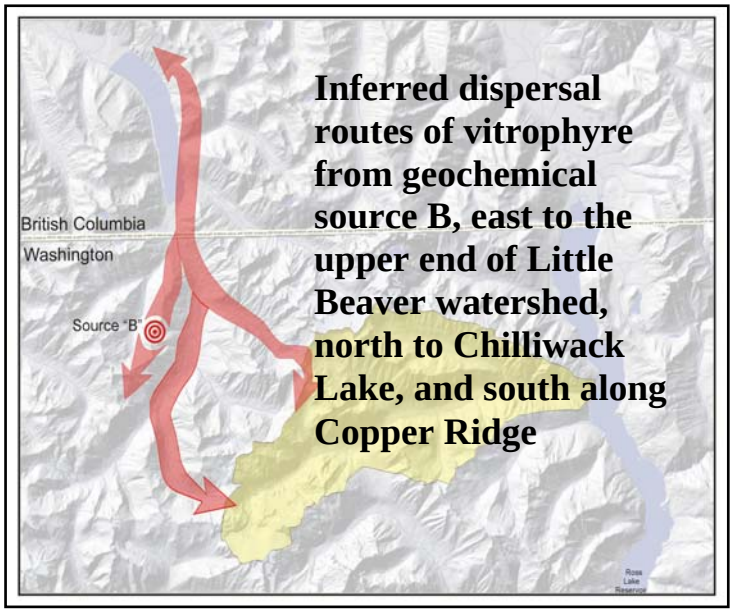

Figure 22. Map showing inferred dispersal routes of vitrophyre from Copper Ridge source B

For those readers who have experienced these high massifs on extended, off-trail trips across the backcountry, the site geography plotted in the above maps will have special significance. Those who lacking such direct involvement with this mountain environment may not readily appreciate the degree of knowledge and adaptive skills required by indigenous travel groups to successfully cope with this rugged terrain. If nothing else, data from the project area call for a consideration of how indigenous groups traveled the high country. Of the 11 total cultural resources in the Little Beaver aggregate sample, six are in the subalpine; eight are accessible from the valley bottoms only after ascending steep mountain slopes.

Accessing these locations in the pre-contact past, as today, requires negotiating steep valley walls and traversing narrow and exposed ridge lines, accompanied by the recurrent loss and gain of elevation across short distances. In conducting archeological surveys in this terrain, crew members find that mountain goat, deer, and bear trails offer the most dependable routes. The presence of archeological assemblages, with evidence of at least short-term camping in this limiting alpine terrain, leads to an inquiry into the very nature of indigenous mountain travel. Understanding this aspect of indigenous adaptation to the mountain environment—strategies in group mobility—will surely enhance understanding of, and the ability to explain, high elevation archeological assemblages and traditional uses of alpine landscapes.

Examination of the social dimensions of high country travel offers several potentially rewarding lines of investigation. Consideration of the demography of travel groups is one of these. By looking at the composition of travel groups according to demographic characteristics, some of the factors influencing travel in the project area become apparent (this discussion draws on ideas articulated in Mierendorf 1996:46-47). For simplicity, consider two extreme types that encompass the full range of accommodations made by traveling parties to achieve certain levels of mobility. Social variables include age, gender, kinship, and purpose of the trip. Material considerations include the supplies and gear

needed to sustain the traveling party, anticipated modes of travel, and resources that might be exploited along the way, such as tool stone to reprovision exhausted tools.

The first type of traveling party is the slowest, largest, and most secure of the two. It consists of a foraging group characterized by mixed gender and age—members of nuclear and extended families, including grandparents and grandchildren—who come together to collect berries, roots, trout and salmon, and basket materials and medicinals, and to hunt mountain goats, bear, deer, marmots, and birds. Such groups travel with deliberation, most often choosing the paths of least resistance, and with careful selection of overnight camps. They carry with them most of the tools for processing resources, and baskets and leather bags for gathering and transporting what they process and collect. Opportunistic encounters are readily exploited and adjusted to, be they for the chance meeting with a herd of elk or to heed an abrupt weather change forcing a bivouac for extra days. For such a group, the rate of travel was less important; cooking, consuming, and packaging the products of hunting, collecting, and fishing forays were of primary importance. So also was the passing to younger generations of traditional knowledge carried by elders about the names and origins of the places and beings encountered.

Much in contrast, the second kind of traveling party is small and highly mobile, carrying comparatively little gear. Such a party consists of one or a few members, spanning one or two generations, with gender composition dependent on the purpose of the trip. A party of women, for example, depart a base camp in the valley, ascend a ridge line several thousand feet to subalpine meadows, where they collect wild lily bulbs and medicinal plants, returning to their camp in the evening with full burden baskets. Or a husband and wife travel over Hannegan Pass to visit relatives in a Nooksack River village, carrying dried food and gear sufficient for them to move steadily between any suitable overnight stops along the way. If they carry too much, and find that their snowshoes are not needed, they cache them beneath a rock overhang, awaiting the return trip. A raiding party constitutes another kind of travel party, likely composed of one or two generations and a single gender, and characterized by extremely rapid mobility. In actuality, there existed any number of travel party combinations, each accommodated to purpose and terrain, and exploiting a large social and technological repertoire of adaptive techniques. For the high country of the Little Beaver and surrounding watersheds, there are few ethnohistoric details or specific references to the demography of travel and subsistence, much like the rest of the mountainous Northwest Coast interior. Allan Smith (1988:307) was so struck by this lack of knowledge while researching indigenous use of the North Cascades high country that he was compelled to ask "Why in their field research ethnographers in the Pacific Northwest have been remiss in inquiring into how high-altitude land masses have contributed to the traditional material, social, and religious existence of native American groups…?".

Are there demographic characteristics that could be inferred about the people who created the archeological assemblages described in the Little Beaver watershed? Due to small site samples and the limitations of site surface data, I can only offer the general impression that all of the high elevation sites resulted from small, mobile travel groups. The archeological signature of Hozomeen chert quarries in the lower montane zones reflects task-specific tool stone procurement and primary reduction, but at 45WH220 and 45WH552, there is a good

possibility for encampment episodes by extended family groups. The tool-rich assemblage at 45WH631, with its abundance of non-local tool stone types, suggests a short-term travel camp, but much more data is necessary to support inferences regarding site function.

Regardless of limitations in the data, there should be little doubt that indigenous parties in the North Cascades traveled the high country at great risk and performed feats of endurance (that, perhaps, most anthropologists have never considered or performed themselves) as just a routine requirement of traveling across the landscape. Regardless of season, marine-influenced mountains are subject to abrupt weather changes and extremes, and any successful mountain adaptation to these conditions implies the requisite skills for basic mountain survival, including ability to bivouac in the subalpine under a variety of extreme conditions; to travel across snowfields, glaciers, and steep slopes; and to maintain and repair footwear and other key travel gear in order to sustain a maximum of mobility options. During most of the time spent on mountain travel, hypothermia and traumatic injuries are likely to have been the greatest threats.

In the absence of information regarding the details of mountain travel, perhaps the travel conditions and accomplishments of Henry Custer and his Indian guides in the summer of 1859 offer strong clues as to as to the nature of pre-contact indigenous travel in the northern Cascades. In spite of the limitations of historic documents and records, archeological remains will continue to yield the material remains accumulated in the ground by this little understood aspect of Northwest cultural history. For this reason, we are compelled to explore the archeology in the most extreme of Pacific Northwest terrestrial environments and to recognize the former existence of many cultural geographies, reflecting the visitation and use by any number of travel and task parties affiliated with any number of indigenous groups, beginning at least by the middle Holocene, ca. 8,000 years ago.

5.5 Summary and Conclusions

The results of this archeological project advances scientific knowledge of the upper Skagit River valley, its tributaries, and the adjacent mountains. A total of 11 archeological resources is described within the Little Beaver Creek watershed. Estimated site ages range from as old as 8,000 years to several hundred, based on radiocarbon dating, tephrochronology, and stylistic attributes of time-sensitive artifacts. Sites are located in the montane and subalpine vegetation zones, spanning the east-west range of the watershed. These sites reflect a range of subsistence activities, including collecting, quarrying, and refining of tool stone; processing and consuming local food resources; overnight camping, and travel. The scale of indigenous quarrying and refining of tool stone as revealed by archeological evidence from the project area far exceeds the level of tool stone usage based on ethnohistoric evidence in the larger Northwest Coast and the project area.

Out of seven tool stone materials found in the Little Beaver archeological assemblages, two are identifiable to a high level of confidence. The geographic provenance of the Hannegan volcanics and Hozomeen oceanic rocks are mapped, and pre-contact indigenous quarries in both areas have been studied. Hozomeen chert outcrops were quarried on subalpine ridge lines and steep slopes of the eastern extremity of the Little Beaver watershed. Hannegan

volcanic rocks were quarried from subalpine outcrops in the upper Chilliwack River watershed to the west. Using artifact-to-source correlations with vitrophyre and Hozomeen chert, patterns in the anthropogenic transport of the tool stone are discerned. Hozomeen chert was transported west, up the Little Beaver and is found in archeological sites in the Chilliwack watershed. Hannegan vitrophyre from geochemical source B on Copper Ridge was transported by people east, at least as far as the divide separating the Little Beaver and Chilliwack watersheds.

The results of this project contribute information necessary for the informed management of park cultural resources. Several archeological sites in the Little Beaver watershed may be threatened by recreational uses, which will require that these sites be documented in more detail and monitored for any changes in site condition and use. Site data generated from this project is entered into several NPS site management and research data bases. Research data from this project supplements the final results of a collaborative high elevation archeological survey project between North Cascades, Olympic, and Mount Rainier National Parks. The data also link with archeological research and management issues current in British Columbia, as a consequence of tracing the source of vitrophyre artifacts from archeological sites at Chilliwack Lake to geochemical source B from Copper Ridge, located in the upper Chilliwack watershed of the park.

Ultimately, the value of this study will be determined by the extent to which it enlightens its readers regarding the history of human involvement in what today is considered a "wilderness" landscape. In spite of the fact that many today believe that the Cascades interior lacks any enduring involvement with human populations prior to the historic period, this report adds to the growing body of evidence supporting the assertions that mountain environments were important to at least some Northwest Coast Salish groups, and that some up-river bands maintained settlements and economies strongly oriented to the mountainous interior.