AN ARCHAEOLOGICAL INVESTIGATION OF THE GALENE LAKES
AREA IN THE SKAGIT RANGE OF THE NORTH CASCADE MOUNTAINS,
SKAGIT VALLEY PARK, BRITISH COLUMBIA

by

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ABSTRACT

This thesis is the product of two field seasons (1997 and 1998) spent in Skagit Valley Provincial Park in the vicinity of the Galene Lakes. The primary objective of the thesis was to determine the extent of precontact use of mountainous areas through an intensive survey of a relatively small area (~1000 ha). It hopes to dispel a general belief that such areas were marginal to cultures which are best known for their maritime and riverine oriented economic strategies. A second objective was to provide methodological suggestions for working in these difficult environments. The third and final objective was to formulate a land-use model for the precontact use of mountainous areas in order to provide insight for future researchers.

Background research indicates that site distribution and discovery in the study area is complicated by a shifting treeline correlated with changes in climate through time. Sites which were originally created in a subalpine parkland setting may now be obscured today by heavy subalpine tree cover; depending on the time period of the site this may even be reversed.

A total of eight new sites were identified during the survey. Site types represented include solitary flakes of Hozomeen Chert (DgRg 5 and DgRg 12), a lithic scatter (DgRg 11), a solitary projectile point midsection (DgRg 7), a quarry of Hozomeen Chert (DgRg 10), probable huckleberry processing trenches (DgRg 8 and DgRg 9), and an historic hunting camp (DgRg 6). Culturally modified trees are represented at Site DgRg 9 (berry trench site), and also at DgRg 6 (historic camp). Historic components are found at Sites DgRg 8 (berry trench site) and DgRg 11 (lithic scatter site).

The huckleberry processing trenches recorded during the survey represent the first such features recorded in Canada. Previously these have been documented only in south-central Washington State.

All sites recorded appear to be associated with a network of trails focussed around prominent ridgelines, not necessarily close to permanent water. This suggests that the people who used this area were highly mobile and familiar enough with the areas' resources to risk venturing away from life-sustaining water in order to perform tasks. The short working season in high elevation areas would have required a intimate knowledge of the resources available in order to extract them with the necessary haste.
ACKNOWLEDGMENTS

I would like to thank all who were involved in this project directly or indirectly. Foremost I thank Rick Alexander who acted as my field assistant for two grueling seasons in the snow, sleet, wind, and rain which make mountaintops such unique survey areas. My wife Mary DePaoli who understands and appreciates that I need to do things the hard way and is my perennial champion and soul-mate. Kelly Bush for the original inspiration for the project. Bob Mierendorf for his energy and expertise. Dana Lepofsky for allowing me to stick to an erratic schedule. Cheryl Mack for showing me what a berry trench looks like. Dave Schaepe and Heather Myles who coordinated my permit on behalf of Stó:lō Nation. Jim Wiebe and Doug Wilson for coordinating my permit on behalf of BC Parks. Steve Acheson for acting as my Project Officer on behalf of the Archaeology Branch. Finally, I thank those responsible for setting apart the wilderness of Skagit Valley and the North Cascades; the plants and animals which allowed me to have a glimpse of their world; and mountaintops everywhere.
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CHAPTER 1:
Introduction

This thesis explores the precontact\textsuperscript{1} use of subalpine and alpine environments in the Skagit Range of the North Cascade Mountains. In particular, it involves an intensive physical survey of the area surrounding the Galene lakes within Skagit Valley Park, B.C. conducted in 1997 and 1998 (Figure 1). The primary goal of this study is to illustrate that mountainous areas of southwestern British Columbia were important locations of traditional use by aboriginal groups. The final goal is to attempt to formulate a model of this land-use.

The initiative for conducting this project was a concern for the lack of previous intensive research within mountainous areas, particularly in near-coastal regions where studies have concentrated almost entirely upon the lowland maritime economic strategies of its precontact inhabitants. A discussion of this disparity of research is presented as Chapter 2.

Mountainous areas hold a vibrant array of resources usually within a short horizontal distance from areas traditionally studied. While the rigors of using such environments may seem formidable to people today, mountains have lured people for millennia, including those cultures which were considered to have had ample resources in easily accessible lowland areas. Bearing this in mind it is important to remember that the vertical, severe landscape surrounding the mainland valleys and coastal lowlands of British Columbia and Northern Washington which we consider wilderness today, was not to the precontact people of this region (Mierendorf 1986:6). Mountains held unique resources as well as important travel routes shared by different cultures. The groups which used these areas, the forms of use, and the possible archaeological residue from such use is discussed in Chapter 3.
Figure 1. Study area location.
A discussion of the physical environment is provided as Chapter 4. This chapter outlines those geological events which contributed to the unique nature of the study area as it appears today, as well as how it must have looked in the past. Of importance in this chapter is the ever shifting position of the treeline and how this would have affected the manner in which people used the land.

Archaeological survey in mountainous environments brings with it its own challenges. Methods require the flexibility to endure an environment capable of presenting severe changes over brief distances and periods of time. Chapter 5 looks at some of these challenges, provides a summary of the methodology employed, and finally makes suggestions for future work in similar environments.

Chapter 6 presents the results of the survey. An attempt is made to match the type of sites identified with the uses discussed in Chapter 3. The distribution of these sites forms the basis of Chapter 7 in which a model for subalpine and alpine land use is offered. This model focuses on the use of treeline transitional areas along major ridgelines with only a secondary importance on proximity to water. Emphasis is given to the fact that treeline has changed considerably over time, situating sites which were once in treeline transitional areas firmly in what is now subalpine. Two major time periods are believed to be represented in the study area: the post-equestrian and early historic time period when the horse would have been available to transport large amounts of trade goods (particularly dried huckleberries) from difficult to access mountain areas represented by berry trenches; and a much earlier time period represented by lithic artifacts.
Chapter 2:  
Archaeological Studies in Mountainous Areas

This chapter reviews the amount and degree of past upland archaeological work in British Columbia and secondly in the Chilliwack Forest District adjacent to which the study area and Skagit Valley Provincial Park fall. It examines why upland archaeology has not been conducted in the past and why it is only now starting to become a matter of concern. Lastly, it provides a brief prehistory of the North Cascades and surrounding area. As several terms are used to describe the different zones within ‘upland’ areas it is necessary to define them as they will be used in this thesis (see Figure 2). These terms can be used in mountainous areas throughout North America, however, at what elevation they occur and the size of each zone will differ from region to region. ‘Upland’ refers to all areas above the lower subalpine. ‘Subalpine’ refers to the area which is continually treed immediately below the ‘Subalpine Parkland’ The Subalpine Parkland consists of small patches of trees interspersed with meadows. The ‘krumholz’ refers to the stunted tree zone just below the ‘Alpine’ which contains no trees at all with the exception of the very odd twisted specimen.

Figure 2. Mountain schematic showing the location of zones mentioned in the text.
The archaeology of mountainous areas in British Columbia should be considered to be in its infancy, possibly in utero. The reasons for this are varied including a general preconception by many archaeologists that steep rugged areas could not have been used in pre-contact times, and if they were, this would have been so fleeting as to leave only small, imperceptible traces. These areas were generally not considered to hold the resources requisite for human subsistence or of a high enough value to have enticed precontact people in any type of consistent fashion. This is a highly westernized, agriculturally-based view as is reflected in current settlement pattern choices in major valley bottoms and along the coast. Mountainous areas today are only used for brief recreational episodes or for the extraction of industrially important raw materials. People generally do not live in them.

A second factor that has affected the amount of past archaeological research in mountainous regions is simply the difficult logistics of doing such work. There are few archaeologists who are willing to spend the time to gain access to the mountain world especially with the preconception of finding little or no data upon arriving. The access problem has been mitigated to some extent as modern roads cut deeper into upland areas and helicopters can readily dispatch people and gear with pin point accuracy; however, once the vehicle has been left, the survey can once again become onerous. Further, there is some concern over whether or not this ready access is an appropriate manner in which to conduct archaeological research in such areas (B. Mierendorf, pers. comm. 1999). Without total immersion in the environment and appreciation for the methods of access used by the precontact people we study, it is exceedingly difficult to understand just where sites might be located.

Often a great deal of data can be gleaned from archaeology which has been conducted under contract such as archaeological impact assessments and mitigative excavations. This type of work, however, is almost entirely conducted in response to development activities which generally do not occur in upland areas and if they do, at least up until the recent past^2, do not
usually require that such inventory and assessment be undertaken. Such studies, while useful, are not ideal as they usually focus on small areas such as a proposed cut-block or road section. It is difficult to understand the use of the mountain or any environment from such small parcels of information. It is also difficult for the contracting archaeologist to appreciate the land-use of such environments if they are suddenly injected into an artificially constrained work area for a relatively short time. This piecemeal research contributes little to the overall picture of precontact mountain use.

2.1 Upland Archaeology in British Columbia

The mountainous areas of British Columbia have received little archaeological attention, the majority of which, up until very recently, has been associated with contract archaeology. Drawing from a study conducted in 1997 showing the distribution of past archaeological work (Franck et al. 1997a, 1997b) it is possible to determine where intensive archaeological survey work has been conducted throughout the province. Figure 3 below shows the percentage of past intensive archaeological research which has occurred in British Columbia up until 1997 in those biogeoclimatic zones (as defined in Meidinger and Pojar 1991) which occur at relatively high elevations (i.e., ESSF, MH, and AT*) as opposed to those biogeoclimatic zones which occur in low to middle elevations (i.e., BG, BWBS, CWH, ICH, IDF, MS, PP, SBPS, SBS*) The overall distribution of these areas in British Columbia is shown in Figure 4.

From Figures 3 and 4 we can see that survey within mountainous areas of the Province has been greatly underrepresented. While 34% of the Province falls within mountainous biogeoclimatic zones (Figure 4) only 8% of past archaeological survey has been located in such areas, whereas 92% of past survey (Figure 3) has occurred in middle and lowland biogeoclimatic
zones which encompass only 66% of the Province. Obviously survey allocation has been biased in lowland areas both by past research designs and development-related archaeology.

2.1.1 The Chilliwack Forest District

Looking specifically at the Chilliwack Forest District, the district in which the study area falls, the numbers are even more biased regarding past archaeological research in lowland versus upland areas. Figures 5 and 6 show that only 7% of past research falls within the higher elevation zones\textsuperscript{3} which comprise 36% of the district (Franck \textit{et al.} 1997). This scarcity of work in upland zones has changed only slightly in the last couple of years since the data used in these figures was collected. In addition to the work presented in this study, recent archaeological work in the ESSF, MH, and AT zones within this area include research projects by Stó:lō Nation

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{survey_distribution}
\caption{Survey distribution in British Columbia according to biogeoclimatic zones (data from Franck \textit{et al.} 1997a, 1997b).}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{land_distribution}
\caption{Land distribution in British Columbia according to biogeoclimatic zones (data from Franck \textit{et al.} 1997a, 1997b).}
\end{figure}
(Schaepe 1998a) and Simon Fraser University as well as a few projects by archaeological consultants. Even with these recent contributions the overall ratio between lowland versus upland studies in the Chilliwack Forest District is still weighted heavily towards lowland work.

![Survey distribution in the Chilliwack Forest District according to biogeoclimatic zones](image1)

Figure 5. Survey distribution in the Chilliwack Forest District according to biogeoclimatic zones (data from Franck et al. 1997a, 1997b).

![Land distribution in the Chilliwack Forest District](image2)

Figure 6. Land distribution in the Chilliwack Forest District according to biogeoclimatic zones (data from Franck et al. 1997a, 1997b).

2.2 Previous Archaeological Studies

Table 1 shows the distribution of past upland archaeological investigations in the larger region surrounding the study area both in British Columbia and Washington State. Using the southern Interior Plateau and Mountains, Cascade and Coast Mountains of British Columbia, and the Olympic, South and North Cascade Mountains of Washington State as the areas with the most relevance to the study area, the limited amount of previous archaeological work becomes evident. It is important to note that many of these studies fall only within the subalpine zone. Only a very few fall within the subalpine parkland, krummholz, or true alpine.
Table 1. Previous upland work in southern British Columbia and Washington State (does not include the Rockies/Kootenay area or Vancouver Island).

<table>
<thead>
<tr>
<th>Reference</th>
<th>Upland Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blusus Onat 1988</td>
<td>Methow River (North Cascades)</td>
</tr>
<tr>
<td>Fulkerson 1988</td>
<td>North Cascades National Park, Washington State</td>
</tr>
<tr>
<td>Grabert 1975; Grabert and Chesmore 1979; Grabert and Pint 1976</td>
<td>North Cascades</td>
</tr>
<tr>
<td>Hartman 1980</td>
<td>North Cascades National Park, Washington State</td>
</tr>
<tr>
<td>Hedlund 1986</td>
<td>North Cascades</td>
</tr>
<tr>
<td>Miss and Nelson 1995</td>
<td>North Cascades National Park*</td>
</tr>
<tr>
<td>Rice, H.S. n.d.a., n.d.b</td>
<td>Ross Lake* (North Cascades; Upper Skagit)</td>
</tr>
<tr>
<td>Rousseau 1986</td>
<td>Chilliwack River (North Cascades; Skagit Range)</td>
</tr>
<tr>
<td>Schaepe 1998</td>
<td>Similkameen Valley (North Cascades)</td>
</tr>
<tr>
<td>Vivian 1989a, 1989b, 1992</td>
<td>Mount Rainier National Park (South Cascades)</td>
</tr>
<tr>
<td>Bergland 1988, 1986</td>
<td>Mount Rainier National Park (South Cascades)</td>
</tr>
<tr>
<td>Burtchard 1998</td>
<td>South-central Washington State (Southern Cascades)</td>
</tr>
<tr>
<td>Rice, D.G. 1964, 1965</td>
<td>South Cascades</td>
</tr>
<tr>
<td>Zweifei and Reid 1991</td>
<td>Central/South Cascades</td>
</tr>
<tr>
<td>Bergland 1984</td>
<td>Olympic Mountains</td>
</tr>
<tr>
<td>Arcas 1999</td>
<td>Garabaldi Park (Coast Mountains; Squamish)*</td>
</tr>
<tr>
<td>Eldridge, Morely 1996; McLaren et al. 1997</td>
<td>Lillooet (Coast Mountains)</td>
</tr>
<tr>
<td>Franck 1997</td>
<td>Shulaps Range (Coast Mountains)</td>
</tr>
<tr>
<td>Joseph, L. and E. Bikadi, (Creekside Resources) 1998</td>
<td>Callahan Lake (Coast Mountains near Whistler)</td>
</tr>
<tr>
<td>Merchant 1998</td>
<td>Lost Valley (Cayoosh Range; Lillooet)</td>
</tr>
<tr>
<td>Reimer 1998, 1999</td>
<td>Garabaldi (Squamish)</td>
</tr>
<tr>
<td>Rousseau et al. 1993</td>
<td>Cayoosh Range, Lillooet</td>
</tr>
<tr>
<td>Spafford et al. 1994; Alexander 1994</td>
<td>Pavilion Mountain (Coast Mountains)</td>
</tr>
<tr>
<td>Bailey 1995; Ignace et. al 1995</td>
<td>Maiden Creek (Clinton area near Tsilsalt Ridge)</td>
</tr>
<tr>
<td>Merchant and Rousseau 1995</td>
<td>Maiden Creek (Veasey Lake Area)</td>
</tr>
<tr>
<td>Pokotylo 1985</td>
<td>Blusty Mountain, Cairn Peak (Clear Range)</td>
</tr>
<tr>
<td>Rousseau 1987a, 1987b</td>
<td>Cornwall Hills** (Ashcroft)</td>
</tr>
<tr>
<td>Alexander and Matson 1986; Alexander et al. 1985</td>
<td>Potato Mountain (Potato Range; Chilcotin)</td>
</tr>
</tbody>
</table>

* Not upland but in close proximity to study area. ** Not extremely high, although still considered upland in relation to surrounding area.

Several recent small impact assessment projects within subalpine areas in B.C. have not been included in Table 1. None of these projects which fall within close proximity to the study area have yielded significant results. The lack of archaeological evidence from these studies may be partly due to concerns discussed earlier in this chapter regarding isolated parcel type archaeology versus more holistic studies which most consultants rarely have the opportunity to conduct.
In the immediate study area surrounding Ross Lake and the upper Skagit River the vast majority of past archaeological work has been conducted to the south of the international border associated with draw-downs of the Ross Lake Reservoir (i.e., between 454 and 488 m asl.) and the designation of North Cascades National Park (Figure 7). Unfortunately there are no studies which pre-date the inundation of the valley (Mierendorf et al. 1998:23).

2.2.1 Archaeology in North Cascades Park, WA

The earliest surveys in the North Cascades Park (NCP) area of Washington State were conducted by Rice (n.d.a., n.d.b.). However, no sites were located during these efforts and the notes regarding methodology and actual areas covered are too sketchy to determine the efficacy or completeness of these surveys. Rice does state in his report that sites were probably not found because of the lack of anadromous fish and “because there were not many places where archaeological sites would logically be expected” (in Mierendorf et al. 1998:31). Grabert and Pint (1978) recorded the first two archaeological sites along Ross Lake in 1977, one of which (45WH79) consisted of a thick lithic scatter thought to hold artifacts of some antiquity. However, the suspected antiquity of this site was later overturned by Mierendorf and Thompson (1986) who believe that selective artifact collection at the site may have incorrectly lead to this presumption, and instead recognized it as a later dating site. Since Grabert, several studies have been undertaken in NCP focusing primarily around the margins of Ross Lake as well as areas which became exposed during various draw-down occurrences (Mierendorf 1986, 1987b, 1993, Mierendorf and Harry 1993; 1998; Mierendorf and Thompson 1986; Mierendorf et al. 1998). Although a relatively small amount of high elevation work has been conducted south of the border it greatly exceeds that which has been done in nearby areas to the north (e.g., Mierendorf 1987a, Mierendorf 1997; Mierendorf and Skinner 1997).
Figure 7. Location of thesis study area in relation to major parks.
To date, 150 archaeological sites have been recorded within North Cascades Park, 144 of which are precontact in age and 6 of which are historic (Mierendorf et al. 1998:60). Also noted are 66 isolated finds. The vast majority of the these sites (128) are located in draw-down areas below 488 m asl. (lowland areas), whereas only 22 sites have been identified above this elevation. This difference is due mainly to a higher survey area concentration in lower areas and the excellent ground surface visibility present in the draw down-zone (i.e., it is denuded of vegetation). One site of particular interest is the Desolation Chert Quarry (45WH224) located both above and below the high level of Ross Lake (~488 m asl) a little over 2.0 km north of Lightning Creek on the east side of Ross Lake. This site represents a major source area for workable Hozomeen Chert, the dominant local lithic material used by precontact people in the area. Dates from limited test excavation at the site suggest that this resource has been used for at least the last 7,600 years (Mierendorf 1993). Two other chert quarry sites have also been recorded in the Park (Mierendorf et al. 1998).

Mierendorf (1997) did survey briefly through the thesis survey area searching for glassy volcanic rock sources associated with Mt. Rahm volcanics. He identified two of the sites (DgRg 9 and 11) which were later re-examined as part of this study. As Mierendorf’s survey was largely exploratory, and because of the fact that he did not hold the necessary permit to test on the Canadian side of the border, he did not investigate these sites to any great extent. Just south of the border during the same survey Mierendorf also identified a small historic site (45WH519) as well as a pit built at the bottom of a talus slope (Isolated Find 106) which he interprets as possibly representing a temporary storage cache.
2.2.2 Archaeology in Skagit Valley Park, B.C.

As mentioned earlier, little archaeological work has occurred on the Canadian side of the North Cascades in what is now known as Skagit Valley Provincial Park (SVPP). The first survey conducted in the area was associated with the proposed High Ross Dam (Eisner 1971) which would have flooded areas well into Canada but was never realized. This survey, although it did attempt to look at a fairly large area (from the border north for about 20 km along the Skagit River), failed to locate any archaeological resources. Unfortunately such work in forested environments was fairly new and did not include shovel testing making the study somewhat less than intensive.

The first recorded site on the Canadian side of the study area (DgRg 1) was identified by W. "Curly" Chittenden, one of the first homesteaders in the area (Figure 8). In 1972 while bulldozing, Chittenden uncovered a carved bird-effigy stone bowl as well as a small scatter of lithic artifacts about 4 km northwest of the Ross Lake Campground. Chittenden did state in an interview (Chittenden 1994 in Bush 1997:17) that he had also collected artifacts during the 1930s and 40s in what is now known as "Chittenden Meadow" located at the north end of Ross Lake Reservoir.

Rousseau (1988) recorded the first two sites within Ross Lake campground (DgRg 2 and 3) in 1988 as part of an impact assessment for the expansion of the campground (Figure 8). Both sites are lithic scatters, the larger and denser of which (DgRg 2) extends southward into the United States joining with a site originally recorded by Grabert and Pint (1978; Site 45-WH-79). Surface collection and a small test excavation at Sites DgRg 2 and 3 place them somewhere between 6000 and 2400 BP.
Figure 8. Sites recorded in Skagit Valley Provincial Park (1:50,000; NTS 92H/3).
Bush (1997) recorded the fourth site within the same borden unit (DgRg 4) as part of her Master's research at Western Washington University (Figure 8). This site, which is located approximately 10 km north of the border and about 1 km east of the Skagit River, was revisited by the Western Washington University field school in 1997 for further investigation (Bush 1998). Excavation identified a large hearth feature of unknown function, a least 13 different types of lithic material, and two diagnostic projectile points. One stemmed point may date fairly early; however, no absolute dates have been run at this time. The site appears to be located along a definite trail route probably chosen to avoid the difficult washed-out areas immediately adjacent to the Skagit. The latest archaeological work to be conducted in the Park took place in Chittenden Meadow as well as the northern drawdown area of Ross Lake (Figures 7 and 8). This was a joint effort between Stó:lō Nation, Simon Fraser University and North Cascades Park Complex (Lepofsky, pers. comm. 1999). During this study a possible berry drying trench was identified (DgRg 18; Figure 8) in Chittenden Meadow as well as four small lithic scatter sites in the drawdown area (DgRg 14-17; Figure 8).

2.3 Regional Archaeological Chronology

There is no established precontact sequence for the North Cascades area at this time. Attempts to develop such a sequence involve borrowing time-lines from adjacent lowland constructs and attempting to tie them together with the small amount of chronometric information which has been garnered from mountain settings (e.g., Mierendorf 1986; Mierendorf et al. 1998). This is probably a sound approach (basically the only approach at this time) as peripheral lowland cultural developments no doubt had considerable influence on the extent and intensity of the use of mountain areas. It should be noted, however, that not all the groups which are reported to have used the range ethnographically are associated with coastal economies (e.g.,
the Nlaka'pamux; see Chapter 3.0). There is no evidence that any groups lived in higher portions of the North Cascades year-round which makes extrapolations from surrounding established chronologies somewhat appropriate. Slightly more work has been undertaken constructing such a sequence for the South Cascades (e.g., Lewarch and Benson 1991; Burtchard 1998); however, whether or not this is relevant to the study area concerned here is not clear. These latter studies do, however, provide good baseline information for cultural changes on a more regional scale.

The earliest known use of the North Cascades and its peripheries extends as far back as late Pleistocene times (10,000-12,000 years ago) as evidenced by the presence of Clovis spear points at the East Wenatchee (Richey Clovis Cache) Site in Washington State (Gramly 1993; Mehringer 1988; Mehringer and Foit 1990; Meltzer and Dunnell 1987) and possibly by recent finds of Scotsbluff-like spear points during drawdown surveys at Stave Lake (Figure 7) in British Columbia (Eldridge and McLaren 1998; Maxwell Christensen and Owens 1998; McLaren et al. 1997a, 1997b; McLaren 1998; McLaren and Maxwell 1998; McLaren, D. J. Stafford and T. Dandurand 1998; Millennia Research Ltd. and Kwantlen First Nation 1998; Ryder 1998; Stafford and McLaren 1998, Vincent 1998). Absolute dates have not been attained for any of the ‘apparently early’ point styles recovered in the region. In the Stave Lake case this is due to the disturbed context in which the artifacts were found, while a single mid-Holocene date from the Wenatchee Site does not correlate with other dated Clovis Sites. A single Clovis projectile point found near Lake Cle Elum (Hollenbeck and Carter 1986) in Washington State represents the only such artifact which has been found directly in the Cascade Range.

The very recent discovery of a stemmed projectile point in the lower Fraser Canyon (D. Schaepe, pers. comm. 1999) resembles others which have been dated in early contexts in nearby plateau areas of Washington and Idaho (e.g., Rice 1972). This artifact does not, however, exhibit the heavy edge grinding which is commonly found on early dating artifacts of the same type. Some researchers, particularly Bryan (1980, 1988) suggest that the stemmed point tradition may
in fact pre-date that of the more well-known Clovis culture, although this remains a bone of contention with many. A single stemmed projectile point was recovered in an excavated context within Skagit Valley Park near the study area (DgRg 4; Figure 8) by Bush (1998); however, dateable material was not found associated with this artifact.

Regardless of the fact that these artifacts described above (Clovis, Scotsbluff, and Stemmed Projectile Points) are not associated with absolute dates, their presence in and around the North Cascades does suggest that late Pleistocene (presumably big game hunters) were in the Northwest at this time, and could well have utilized its mountainous regions.

Other sites considered to perhaps fall within this early period within the region include the South Yale Site from which a previously unknown lithic tradition termed the "Pasika Complex" was identified. This complex consisted of large waterworn chopping tools which were believed to predate artifacts found at the nearby Milliken Site (DjRi 3; Irvine 1973; Kidd 1968; Mitchell 1965; von Krogh 1975). This inference was based on the apparent crudeness of the tools without any absolute dates to substantiate such a claim. Artifacts similar to that found at the South Yale Site were also identified near Hope, B.C. (Site DiRi 1; Franck et al. 1994). Haley (1987, 1996) later established that the crude unifacial cobble tools characteristic of the postulated Pasika Complex are more than likely associated with later period developments. Such artifacts have been found in fairly recently dated sites and appear to represent a common tool type used over a long period of time.

There is considerably more evidence for use of the region during the time period between 9,000 and 4,000 years ago. The earliest date from this time remains the "Old Cordilleran Tradition" component excavated at the Milliken Site in the southern portion of the Fraser Canyon (Borden 1960, 1975; Mitchell and Pokotylo 1996). This tradition is typified by large leaf-shaped knife and spear points in association with otherwise simple stone tools. Sites to the south and east of the North Cascades which fall within this time period include those excavated
along the Columbia River between the Okanagan and Wenatchee Rivers (Mierendorf and Bobalik 1983; Galm and Masten 1985; Chatters 1986). This early Holocene period is represented in the study area most locally by the Desolation Chert Quarry which produced a basal date of around 7,600 BP with the heaviest use occurring between 3,500 and 5,000 BP (Mierendorf 1993). Mierendorf (1991) suggests that the North Cascades appear to have been used more intensively during the middle Holocene time period than any other (Mierendorf 1998). Other North Cascades area sites which fall within the early to mid-Holocene time period in Washington State include Chester Morse Lake which produced a date of 8,540 BP (Samuels 1993); and dates inferred from artifact types recovered from the lower Similkameen River Valley (Salo 1987).

Sites from the mid-Holocene period are believed to reflect the use of a wider variety of plants and animals than had occurred in earlier times; however, did not generally involve food storage or the establishment of semi-permanent villages (Schalk and Cleveland 1983; Ames and Maschner 1999). Anomalous mid-Holocene village sites or sites which contain residential structures near the study area, include the Esilao Village Site (DjRi 5; Borden 1975; Figure 9) located in the lower Fraser Canyon, and the Maurer Site (DhRk 8; LeClair 1973, 1976; Schaepe 1998b; Figure 9) located in the upper Fraser Valley. The dates for these houses do fall within the latter portion of the mid-Holocene (ca. 4000 BP) exhibiting the next general trend toward sedentism. From 4000 years ago up to the time of sustained contact with Europeans (around 200 years ago), a dramatic shift in the economies of Northwest People began to occur. This period saw the establishment of large permanent villages, an emphasis on food storage, and a general decline in wide-ranging food procurement except by small task-oriented groups (Schalk and Cleveland 1983; Kuijt 1989). Village sites associated with this time period include the Flood (DiRi 38) and Pipeline (DiRj 14) pithouse sites excavated by von Krogh (1980) near Hope, B.C.
Figure 9. Location of selected archaeological sites in the upper Fraser Valley and lower Fraser Canyon referred to in the text (adapted from Franck et al. 1994:6).
and the Scowlitz (DhRI 16) mortuary mound and village site located at the confluence of the Harrison and Fraser Rivers which is still under investigation (Lepofsky et al. 1999, 2000; Figure 9). Dates obtained from these sites range from ca. 2800 to 300 BP (von Krogh 1976, 1980; Lepofsky et al. 1999). Other pithouse village sites located near the flanks of the North Cascades representative of the late Holocene time period include those near the Okanagan (Grabert 1968), Methow (Swanson 1959), and Columbia (Nelson 1973) River valleys. Sites which actually fall within the mountainous areas of the North Cascades from this time period are thought to represent the small, task oriented groups which radiated out from these larger villages in search of game and plants that were not available in lower climes (Mierendorf et al. 1998:36-7). These sites are generally typified by thin, usually unstratified, lithic scatters, depressions from roasting and cache pits, and possibly depressions associated with the drying of huckleberries.

The protohistoric and early historic period saw enormous changes in the way aboriginal peoples used the land. This was influenced particularly by the decimation of the aboriginal population from European diseases such as smallpox (Carlson 1997; Harris 1994) as well as technological influxes including the horse and metal tools. Such changes greatly affected the way in which aboriginal people used the land perhaps initiating a greater dependence on certain resources than had occurred previously. This would have greatly affected the way in which this use was portrayed archaeologically over the landscape and may be responsible for such archaeological sites as the berry trenches which are presented in this study.
Chapter 3:

ETHNOGRAPHY AND HISTORY OF THE STUDY AREA

This chapter is a compilation of the ethnographic and historic land-use information of the study area. Most weight is given to the aboriginal use of the land as such use is the central focus of this thesis. A basic historical summary is also given as some of the events within this history have affected the way in which aboriginal use of mountainous areas changed over time, as well as directly contributed to the archaeological record itself.

3.1 Ethnography

The ethnographic record of the study area has been extracted primarily from studies conducted in the peripheries of the North Cascades. While these ethnographies do contain some specific information regarding the use of upland and mountain environments, they are heavily weighted towards lowland subsistence activities and cultural organization. Nevertheless, a suitable amount of information can be derived from these early works to begin to understand land-use patterns within mountainous areas, and suggest what residues this use might have left behind. This chapter begins with a brief description of the main cultural groups which are believed to have used the study area and/or areas near to it. Secondly, it discusses how and when this use occurred beginning with hunting strategies, followed by plant extraction, and finally other uses. Suggestions regarding how each particular cultural activity might show up on the landscape today are also presented.

There appears to be no one First Nations group which can lay sole claim to use of the mountainous areas within and surrounding the study area. There is also no evidence that any particular group occupied the region on a year-round basis, although extended forays into it are suggested for some. The main First Nations groups concerned here include (from north to south) the Lower Nlaka'pamux (or Thompson); the Tait and Chiliiwack Tribes of the Upper Stó:lô; the
Nooksack; and the Upper Skagit. Other possible users of this country include the now-extinct Athapaskan-speaking Nicola people, as well as North Okanagan people from the Similkameen area. Information regarding these last two groups, however, is brief and is not discussed further in this thesis.

Territorial maps are provided within ethnographies for all of the groups mentioned above. These include those provided by Teit (1900:166) and Laforet and York (1998:4) for the Nlaka'pamux; by Duff (1952:20) for the Upper Stó:lō Chilliwack and Tait tribes; for the Nooksack by Duff (1952:20 and Smith 1950:340), and for the Upper Skagit by Collins (1974:17). Considerably more information regarding traditional territories of these groups is provided as part of the text within these volumes, among others. Much of this work has been summarized by Smith (1988) which represents the only major attempt so far to synthesize the previous ethnographic work for the mountainous areas of the North Cascades. Figure 10 below provides territorial boundaries for First Nations discussed in this thesis as outlined in the ethnographies discussed above.

3.1.1 The Lower Nlaka'pamux

The Lower Nlaka'pamux represent the only Interior Salishan-speaking group which used the study area to any considerable extent (Figure 6). The language spoken by the Nlaka'pamux, known as “Nlak'pamuxcin”, is considered distinct though related to that of Shuswap (Secwepemc) and to a lesser extent of Lillooet (Stl’átl’imx). All three languages comprise the Northern Group within the Interior Salishan Division (Thompson 1979:692-695). While the main body of traditional Lower Nlaka'pamux territory is located in the Fraser Canyon area with Spuzzum (Spů’zēm) representing the most southerly winter village, the hunting and gathering area of the Nlaka'pamux is believed to have extended far below the international border (Hill-
Figure 10. Traditional territories of First Nations mentioned in the text, as well as that of surrounding groups. (Base map adapted from Draffen et al. 1993:31 using information provided in Collins 1974:17; Duff 1952:20; Laforet and York 1998:4; Smith 1950:340; Smith 1988:7, 17)
According to Teit (1900:166) the Lower Nlaka'pamux hunted in and lay claim to areas surrounding the Upper Skagit and what is now Ross Lake, as well as the mountainous regions surrounding Chilliwack Lake and the upper Chilliwack River. To the south this use was believed to have extended to the "headwaters of the Nooksack and Skagit Rivers" (Teit 1900:168). In later times when the Athapaskan-speaking Nicola died out in the protohistoric and early historic period, the Nlaka'pamux expanded into their territory to the east as well as areas also used by the North Okanagan in the Similkameen Valley (Smith 1988).

The Nlaka'pamux are believed to have used the study area primarily during the winter, arriving on snowshoes after the Fraser Canyon fishing season ended and interests turned more towards that of hunting (Collins 1974:14-15, 66). Certain groups of Nlaka'pamux are believed to have stayed through the winter in order to hunt, fish, as well as gather plant crops during the spring and summer (Collins 1974:14-15, 66). Teit (1900:239) notes that hunting parties visiting this southernmost portion of their traditional territory would sometimes be gone upwards of seven months, returning "only when the snow began to melt in the mountains". Smith (1988:191, 230) suggests that if such winter use did occur within the mountainous areas of the upper Skagit and Ross Lake area, substantial campsites/village sites must exist in or near the study area since the closest permanent winter village of the Nlaka'pamux was at Spuzzum (Spô'zêm), 77 km north of the international border.

Trails used by the Nlaka'pamux to access the study area are not well known, except for those which followed either side of the upper Fraser Canyon, which Fraser (1960:96) described as being somewhat perilous routes "where no human being should venture". In order to enter the study area entirely through their own territory would have been particularly arduous. Instead it is considered more likely that they moved through the territories of the Halq'eméylem speaking Upper Stó:lō groups of the Lower Fraser Canyon and Hope area, then by the Silverhope-
Klesilkwa (Mierendorf et al. 1998:11; Smith 1988:191) route, or by way of the Similkameen-Lightning Creek route (Smith 1988:191). The tricky canyon trails could have been avoided through the use of a known route to the west past Harrison Lake, Lillooet River, and Lillooet Lake, over to Anderson and Seton Lakes, finally descending the Inkmutch River to the Fraser below the Canyon (Mayne 1862:67, 93-54, 132-138). A connection with the Skagit Valley, the North Cascades (including Mount Baker), and trails leading through the mountains to reach this area are noted in Laforet and York (1998:4,5,66).

While in the Skagit River and Ross Lake area, Nlaka'pamux would sometimes encounter Upper Skagit groups whose northern traditional use boundary is believed to have been located near the study area (see 3.1.4). Such encounters often resulted in hostilities as both groups claimed use of the area and saw the other as a distinctly foreign group both in appearance and language (Collins 1974:15, 115, 118-119). Other groups believed to have encountered the Nlaka'pamux in the area (Upper Stó:lō and Nooskack) were thought to have been on more friendly terms; however, the Chilliwack are also reported to have fought at times with the Nlaka'pamux during mountain meetings (Smith 1988:142).

3.1.2 The Upper Stó:lō

While six separate “tribelets” are considered to comprise the Upper Stó:lō Culture Group (Duff 1952:11-12; Elmendorf and Sutlles 1960:1-2, 17) only the Tait and the Chilliwack are believed to have used the Skagit Valley and the mountainous areas above which the study area falls (Smith 1988; Figure 10). Both groups were speakers of the Halq'emeylem language of the Coast Salish Language Group; however, the Chilliwack were believed by some to have spoken a language similar to the now-extinct Nooksack language as late as 1700 (Boas 1894:455; Duff 1952:11, 12, 39, 43; Hill-Tout 1903:355, 357).
The Tait occupied the lower part of the Fraser Canyon as far north as Five Mile Creek just south of the Nlaka'pamux village of Spuzzum (Spô'zêm), and as far south as Seabird Island and Popkum (Duff 1952:19). The Chilliwack originally lived in the area of the Chilliwack River Canyon and above and are believed to have only recently moved down along the Fraser during the 1830s (Boas 1894:455-456; Duff 1952:43). It is suggested that this move occurred at this time because of the protection from downstream raiders offered by the presence of Fort Langley, as well as the change in course of the lower Chilliwack River (Boas 1894:455-456; Duff 1952:43). This lower portion of the river which originally emptied into Sumas Lake before entering the Fraser, switched to a northern course and its present Vedder Crossing locality sometime in the early historic period (Smith 1988). This change resulted in the developing Chilliwack prairie which was at one time a spongy, wet, and generally undesirable area for habitation (Smith 1988:79).

Unlike the Nlaka'pamux, Upper Stó:lō groups were believed to have used the study area primarily during the summer and fall (Smith 1988). The main area of use for the Chilliwack is believed to have been that around and above Chilliwack Lake; however, there is some indication that they occasionally ventured east into the immediate study area (Smith 1988). Duff (1952:21) notes that the Tait sent hunting (and gathering?) parties into the mountainous areas several days east (and presumably south as well) of the Fraser during which time they sometimes met Upper Skagit people. This suggests that the Tait likely did utilize the study area. The meetings between the Tait and the Upper Skagit were believed to be usually friendly; however, the Chilliwack and Upper Skagit supposedly had rare hostilities (Collins 1974:118-119).

Major trail systems leading from central Upper Stó:lō Territory into the study area are not well known; however, several indications that the Upper Stó:lō had contact with plateau (Okangan-Colville) groups to the south and east of their core areas suggests that these trails likely passed through or near to the Ross Lake/Skagit River area (Ross 1956:37). These routes
likely included trails along the Methow and Similkameen River systems (Brown 1914; Smith 1946:309, 316, 320). It has been suggested that the similarity between middle Fraser and Columbia Plateau and Coast petroglyphs suggests that such a connection did exist; likely by way of a trail through the Cascades (Smith 1946). In the more immediate study area trails are expected to exist between the Hope area and the Skagit via Silverhope Creek and the Klesilkwa River as this represents the easiest physical route from the north (Mierendorf et al. 1998:11). Several sites identified in 1999 along Silverhope Creek (Franck and Schaepe 1999) may be evidence of this use. For the Chilliwack it is likely that trails extended eastward from their core territory in the Chilliwack Lake area towards the study area over some of the high mountain passes. Wilson (1970:62-63) notes that the Chilliwack did appear to have considerable knowledge of the resources of the study area.

3.1.3 The Nooksack

Little is known of the Nooksack people who occupied the area to the south of and overlapping with the Chilliwack (Figure 10). Smith (1950) notes that the culture is generally considered to be extinct but suggests that the Nooksack had a close relationship with the Chilliwack people perhaps due largely to the fact that the old course of the Nooksack River at one time ran north into the Sardis/Chilliwack area. An historic trade connection from Fort Yale through Chilliwack, Nooksack, and finally Lummi was the most-used route between the Fraser and Puget Sound (Smith 1950:331). This connection is believed to have extended into precontact times during which the Nooksack obtained grass [Indian hemp] for making fish nets from the Nlaka'pamux and sturgeon glue used to make sinew-backed bows from the Stó:lō (Smith 1950:332).
Most important to this thesis is the fact that the Nooksack were more or less an inland people with little direct contact with true coastal groups. Marian Smith (1950) postulated that this inland and upland existence constituted a type of “Foothills” culture that developed on the western flanks of the Cascades (Smith 1950: 336). However, little was offered by Smith to distinguish this culture from surrounding groups (Smith 1988:98) which brought criticism to her construct (e.g., Suttles 1957). Regardless of Smith’s success in succinctly defining the “Foothills” culture, it is probably reasonably safe to say that the Noosack did use the mountainous areas to the east of them. These areas would have held numerous valuable resources which could be consumed and/or would have figured prominently as trade items with more coastal-based groups.

3.1.4 The Upper Skagit

The Upper Skagit spoke a dialect of Loosheetseed (Puget Sound Salish), a language that was considered quite different and unintelligible from that of Nooksack, Halq'eméylem, and especially Nlak'pamuxcin (Suttles 1957:163, 1985; Thompson 1979:693).

The very northern portion of the traditional territory of the Upper Skagit people was located along both sides of the upper Skagit River and surrounding mountains placing them directly within the surveyed area covered in this study (Figure 6). The main body of Upper Skagit territory including the locations of their permanent villages, however, lay considerably further south no higher than the community of Newhalem along the Skagit River in Washington State (Smith 1988:20).

The Upper Skagit are believed to have had a strong trade network with plateau groups to the east, indicating that they were accustomed to travel across the Cascades (Smith 1988:33). Such travel, as with the Nlaka'pamux, was conducted primarily in the winter when the rough
terrain was smoothed by snow (Collins 1974:6; Smith 1988:57). With the introduction of the horse, the trade network expanded in size and range including such goods as “root cakes, dried berries, buffalo robes, and many other heavy or bulky packs, which in former days it did not pay to carry [across the mountains]” (Teit 1928:121).

The Upper Skagit were believed to have used the Ross Lake and immediate study area primarily during the summer months generally as a resource area, not as a place of long-term residence. During these months they would enter the high country to hunt game and gather plants which were not available in the lower areas near their winter homes to the south (Smith 1988:55). The main route into this area was, most obviously, up the Skagit River probably by both footpath as well as by canoe for some stretches (Smith 1988:32-33). The trail was improved in 1852 extending up into British Columbia where it connected with the Niccolum trail (Collins 1974:38). This trail, which was improved by Euro-Americans, likely followed the original aboriginal trail into the area. Many of the original trails had become overgrown and impassable by the mid 1800’s due to disuse by the Upper Skagit caused by decimation of the population from European disease and a shifting economy based more on trading with European fur traders than with traditional partners (Gibbs 1877:180).

As mentioned previously for the Nlaka’pamux (Chapter 3.1.1), the Upper Skagit and the Nlaka’pamux were known to be hostile to one another when meeting in the region around the study area (Collins 1974:15, 115, 118-119). The Nlaka’pamux appear to be the only group which also used the area with which the Upper Skagit regularly fought. Upper Skagit presumably co-mingled amiably with the Upper Stó:lō and Nooksack with which they sometimes intermarried (Collins 1974; Duff 1952:21); however there is some indication that the Chilliwack and Upper Skagit would sometimes engage in rare hostilities (Collins 1974:118-119).
3.2 Animal Use

The North Cascades area offered particular animal resources which were not available in the lower elevations in which First Nations were known to establish their permanent villages (see Section 3.1). The most notable animals sought were the mountain goat, which lives its entire life at high altitude, and the grizzly bear which, in this region, also prefer to spend the vast majority of their time in high, isolated areas. Other animals, although less revered than mountain goat and grizzly, were also known to be pursued at altitude. These included deer and elk (many of which spent considerable time in the high country), black bear (many of which spend their summers in the alpine), marmot and pika (perennial mountain dwellers), grouse and ptarmigan (of which ptarmigan is only found at altitude), among others (see Table 2). Animals were hunted using a wide variety of methods including bow and arrow, deadfalls, traps, snares, fences, and pursuit with the aid of dogs. Two methods which were particularly unique to the mountain environment are discussed below.

Mountain goat was probably the most important animal species hunted specifically in the alpine areas of the North Cascades (Duff 1952:71; Laforet and York 1998:66; Teit 1900:249). Mountain goat wool was a valuable trade item to all groups which used the study area (Smith 1988:55; Teit 1900:260) and goat meat was considered to be only second in importance to bear (Duff 1952:71). An unusual manner of hunting these animals is described in Duff (1952:71-72). He describes a technique whereby one hunter would chase a goat along a narrow path at a precipice where another hunter would be waiting with a large stick to knock the animal over the cliff to its death. While this is an interesting manner in which to dispatch goats, it is unknown how the technique might show up archaeologically. One possibility would be evidence of high impact trauma in the faunal remains consistent with a fatal fall. It seems reasonable also that
areas in which this strategy proved successful likely were re-used and could be associated with temporary camp and processing areas.

A dangerous method of hunting grizzly bear is described both for the Stó:lō (Duff 1952:72) as well as for the Nlaka'pamux (Teit 1900:248-249). Both are slightly different but each involve wedging a section of pointed bone stick inside a charging bear’s mouth and subsequently dispatching it with a spear or club while it tried to free itself of the encumbrance. Unfortunately this type of hunting would not likely have produced any sort of residue whatsoever, not even in the form of base camps, as it was generally believed to be the strategy of a solitary hunter undertaken to prove his bravery and skill.

By far the most common archaeological residue which would persist in the study area from hunting would be lithic waste and tools, either associated with hunting events themselves, or with associated support camps or game monitoring areas. Table 2 gives a list of animals which were known to be hunted in the subalpine and alpine areas of the North Cascades and suggests how their hunting may be reflected in the archaeological record.
<table>
<thead>
<tr>
<th>Game</th>
<th>Method of Procurement</th>
<th>Season</th>
<th>Expected Residue</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer</td>
<td>bow and arrow, nets, nooses, fences, spring pole snare, natural constrictions, run down with dogs, run down in snow, run over cliffs, log deadfalls</td>
<td>summer/fall (most commonly)/winter (rarely)</td>
<td>broken projectile points especially at natural constrictions and along bluffs where game could be driven into, also near water sources and salt licks where deer would gather (shallow pits for blinds may also occur in these areas), consistently spaced depressions over long distances indicating fences. Solitary pits along game trails, lynch poles at places where game could be monitored while preparing artifacts, small support camps</td>
<td>Cohrs 1974:52, 53; Duff 1952:71, 72; Fraser 1960:98, 114; Tset 1900:248-249; Labret and York 1998:60, May 1942:117-123, 140; Tset 1900:248-249</td>
</tr>
<tr>
<td>Elk</td>
<td>bow and arrow, driven over cliffs, run down in snow and clubbed or shot</td>
<td>summer/fall (most commonly)/winter</td>
<td>broken projectile points at the base of cliffs, along near water and salt licks where elk would gather (shallow pits for blinds may also occur in these areas), small support camps</td>
<td>Duff 1952:71, Tset 1900:248-249.</td>
</tr>
<tr>
<td>Grizzly Bear</td>
<td>bow and arrow, spear, club, distracted with pointed bone placed in animal's mouth, log deadfalls, dragged out and killed while hibernating, trained dogs (rarely used)</td>
<td>fall (most commonly)/winter/Spring</td>
<td>broken projectile points especially near good denning areas, pits along bear trails, small support camps, bears' heads sometimes placed in tree to ensure continued supply of bear (Upper Slough, Cohrs 1974:54). Also sometimes by Nuu-kusmu for protection (Tset 1900:347)</td>
<td>Cohrs 1974:53, 55; Duff 1952:71, Labret and York 1998:60, May 1942:117-123, 140; Tset 1900:248-249</td>
</tr>
<tr>
<td>Black Bear</td>
<td>bow and arrow, spear, club, log deadfalls, run down with dogs, snared with noose, dragged out and killed while hibernating</td>
<td>fall (most commonly)/winter/Spring</td>
<td>broken projectile points especially near good denning areas, pits along bear trails, small support camps, bear's heads sometimes placed in tree to ensure continued supply of bear (Upper Slough, Cohrs 1974:54). Also sometimes by Nuu-kusmu for protection (Tset 1900:347)</td>
<td>Cohrs 1974:53, 55; Duff 1952:71, Labret and York 1998:60, May 1942:117-123, 140; Tset 1900:248-249</td>
</tr>
<tr>
<td>Mountain Goat</td>
<td>bow and arrow, spring pole snare, pushed off cliffs with a stick</td>
<td>summer/fall (most commonly)</td>
<td>broken projectile points at the bottom of small cliffs, against cliffs, small support camps, lynch poles at areas where goats could be monitored from, rock outcrops.</td>
<td>Duff 1952:71, 72; Labret and York 1998:60, May 1942:117-123, 140; Tset 1900:248-249</td>
</tr>
<tr>
<td>Coyote/Fox</td>
<td>smoked out of burrows and clubbed, bow and arrow</td>
<td>spring/summer/fall/winter</td>
<td>unknown</td>
<td>Tset 1900:249.</td>
</tr>
<tr>
<td>Grouse/Ptarmigan</td>
<td>Bows and blunted arrows, clubs, spring pole snare,</td>
<td>spring/summer/fall/winter</td>
<td>broken projectile points</td>
<td>Ray 1942; Smith 1988:143-150, Tset 1900:248-249</td>
</tr>
<tr>
<td>Eagles</td>
<td>eyes, spring pole snare</td>
<td>unknown</td>
<td>remains of rock eyries</td>
<td>Tset 1900</td>
</tr>
<tr>
<td>Others: cougar, fisher, hare, lynx, marten, mountain beaver, porcupine, squirrel, woodpecker, other birds</td>
<td>various methods including bow and arrow, spring pole snare, nets, clubs</td>
<td>opportunistic</td>
<td>various</td>
<td>Cohrs 1974, Duff 1952; Labret and York 1998; May 1942; Smith 1988; Tset 1900:230</td>
</tr>
</tbody>
</table>

Table 2. Methods and possible residues from the hunting of various animal species which are/were available in the study area.
3.3 Plant Use

The use of plants has been rather well documented for the Nlaka'pamux (Steedman 1930; Teit 1900; Turner 1978; 1997; Turner et al. 1990) and somewhat less so for more coastal-based economies such as the Stó:lō and Upper Skagit (Collins 1974; Duff 1952; Turner 1995; Washbrook 1995). No volumes to date have concentrated on the traditional use of plants available only in the alpine and subalpine regions of southwest British Columbia; however, most references do note that certain plant varieties are/were available only in upland areas. Unfortunately, many early ethnographers concentrated primarily on seemingly more glamorous pursuits than plant gathering such as hunting, or became deeply mired in the study of social constructs, beliefs, and rituals. It would seem reasonable to assume, however, that the abundant and unique plant resources which grow in high elevation areas of the North Cascades contributed strongly to the economy of the people who traditionally used the region.

Many of the plants which are available either exclusively or in great number in subalpine and alpine areas of southwestern British Columbia are bulb plants. These include avalanche, glacier, and tiger lily, as well as great camas and spring beauty. These plants provided not only an important carbohydrate component to the diet of aboriginal people (Kuhnlein and Turner 1991:9-10) but were also an important trade commodity. All bulbs required some form of cooking in order to become palatable or digestible (Kuhnlein and Turner 1991:9-10), often utilizing an underground pit oven in which the bulbs were steamed or boiled. The depressions from such processing represent the main archaeological residue from their harvest. Unfortunately bulbs were probably not always processed in the areas in which they were dug. Another line of evidence for the repeated use of root as well as other crops such as berries (see below) is that which may be visible from the controlled burning of mountain areas (e.g. see Laforet and York 1998:68; Turner 1991). Periodic burning greatly increases the production of
many food plant species which otherwise become overgrown by competing species. Exactly how intentional burning shows up in the archaeological record is currently being investigated (e.g., Lepofsky et al. n.d.), but most likely would include evidence such as a distinct layering of isolated charcoal deposits.

Subalpine and alpine berry species were also a major resource for aboriginal people. These included black and cascade huckleberry, crowberry, dwarf blueberry, grouseberry, among others. Little evidence of their use is left behind with the exception perhaps of patterns of controlled burning (as discussed above) or in some cases the remains of trenches in which they were dried. Berry trenches are a relatively new type of site in British Columbia having only previously been recorded in Washington State (e.g., Mack 1989, 1992, Mack and McIure 1998; Miss and Nelson 1995). Drying the berries while in the alpine greatly reduced their weight without losing their nutritional value (Kuhnlein and Turner 1991; Norton et al. 1984:223) creating an extremely valuable resource which could be later eaten or exchanged. A further discussion of these features is provided in Chapter 6.

Most plant use does not leave any archaeological residue and its true extent can only be speculated. A list of the plants which are known to have been used, the season in which they were normally harvested, and the expected residue of such use is provided as Table 3.
<table>
<thead>
<tr>
<th>Year</th>
<th>Surface and Alpine Plants Their Uses, Seasonal Availability, and Archaeological Residue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>Unknown</td>
</tr>
<tr>
<td>2024</td>
<td>Unknown</td>
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<td>2049</td>
<td>Unknown</td>
</tr>
<tr>
<td>2050</td>
<td>unknown</td>
</tr>
</tbody>
</table>

Table 3: Surface and Alpine Plants Their Uses, Seasonal Availability, and Archaeological Residue.
<table>
<thead>
<tr>
<th>Species</th>
<th>Uses</th>
<th>Season Harvested</th>
<th>Expected Residue</th>
<th>References</th>
</tr>
</thead>
</table>

Table 3. Subalpine and alpine plants, their uses, seasonal availability, and archaeological residue.
<table>
<thead>
<tr>
<th>Species</th>
<th>Uses</th>
<th>Season Harvested, Notes</th>
<th>Expected Residue</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian hellebore</td>
<td>Throughout the summer and fall.</td>
<td></td>
<td>Unknown</td>
<td>Parish et al. 1996; 30; Pope &amp; MacKinnon 1994; 113; Steedman 1930:5:10:5:12; Turner 1920:291; 36; Turner 1970:220; 227; Turner 1955:2; 139; 145; Turner 1997:180; 181; Turner and Betts 1972; 274; Turner et al. 1990:33; 34; 46; 48; 52; 56; 58; 64; 69; 137; 138; 252; 252; 294.</td>
</tr>
<tr>
<td>Kinnikinnick</td>
<td>Late fall to early winter for food, throughout the year otherwise. Berries were usually boiled, hearths possible; bark stripped trees for making mats.</td>
<td></td>
<td>Unknown</td>
<td>Parish et al. 1996; 85; Pope and MacKinnon 1994; 197; 190; 408; Steedman 1930:5:18; 486; 493; 195; 514; Turn 1900:232; 233; 333; 336; 309; 62; Turner 1970:225; 233; 143; 216; 219; Turner 1995:3; 16; 36; 211; 187; 137; Turner 1997:4; 22; 30; 111; 112; 175; 176; 177; Turner et al. 1990:21; 23; 24; 31; 44; 46; 48; 51; 56; 62; 65; 78; 106; 196; 202; 212; 213; 216; 220; 288; 294.</td>
</tr>
<tr>
<td>Mountain sorrel</td>
<td>Spring through fall.</td>
<td></td>
<td>Unknown</td>
<td>Parish et al. 1996; 199; Pope and MacKinnon 1994; 89.</td>
</tr>
<tr>
<td>Salmonberry</td>
<td>Spring, early summer.</td>
<td></td>
<td>Unknown</td>
<td>Calhoun 1979:50; Parish et al. 1996; 61; Pope and MacKinnon 1994; 76; Test 1900:232; Turner 1978:209; Turner 1995:10; 13; 16; 17; 68; 93; 95; 116; 127; 142; Turner 1997;152; 164; Turner et al. 1990:19; 21; 22; 26; 64; 201; 269; 272.</td>
</tr>
<tr>
<td>Spring beauty</td>
<td>Late spring to early summer, perhaps later if one knows where to dig (after the flower is gone). Pits used for steaming, controlled burning pattern, bark strips on nearby trees, digging sticks (preserved in rare, dry situations), hearths nearby, post moulds from drying scaffolds. Remains of stakes (unlikely) or rocks marking patches.</td>
<td></td>
<td>Unknown</td>
<td>Jako and Yost 1997; 185; Parish et al. 1990; 258; Pope and MacKinnon 1997; 134; Steedman 1930:5:18; 513; Test 1900:309; Turner 1970:215; Turner 1977:169; 170; Turner et al. 1990:47; 50; 186; 262; 299.</td>
</tr>
<tr>
<td>Sticky currant</td>
<td>Summer through fall.</td>
<td></td>
<td>Unknown</td>
<td>Parish et al. 1996; 53; Steedman 1930:47; 487; Test 1900:232; 369; 309; Test 1970:183; Turner 1993:127; 189; Turner et al. 1990:22; 228.</td>
</tr>
<tr>
<td>Subalpine fir</td>
<td>Spring for food (rarely), various times of year otherwise. Stripped and/or chopped trees.</td>
<td></td>
<td>Unknown</td>
<td>Parish et al. 1994; 35; Pope and MacKinnon 1994; 35; Steedman 1930:483; 496; Test 1900:194; 233; Turner 1978:14; 57; Turner 1997:14; 15; 57; 56; 103; Turner et al. 1990:14; 17; 22; 30; 42; 97; 98; 263; 294.</td>
</tr>
<tr>
<td>Thimbleberry</td>
<td>Summer.</td>
<td></td>
<td>Unknown</td>
<td>Calhoun 1974:50; Parish et al. 1996; 62; Pope and MacKinnon 1994; 55; Steedman 1930:488; Test 1900:232; Turner 1978:21; 201; 203; Turner 1995:16; 74; 113; 124; 127; Turner 1997:27; 30; 155; 156; 164; Turner et al. 1990:19; 21; 22; 26; 32; 47; 61; 125; 220; 272; 216.</td>
</tr>
</tbody>
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Table 3. Subalpine and alpine plants, their uses, seasonal availability, and archaeological residue.
<table>
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<th>References</th>
</tr>
</thead>
</table>

Table 3. Subalpine and alpine plants, their uses, seasonal availability, and archaeological residue.
3.4 Other Uses of Mountain Areas

Mountains have attracted people for thousands of years for reasons much less utilitarian than that of hunting and gathering. The sheer beauty and ruggedness of these areas continues to invoke a sense of awe and welling of spirituality in people even today. This often esoteric appreciation for these areas was not lost on traditional aboriginal users.

Mierendorf (1986:97) suggests that alpine areas may have been traveled into as a way of asserting a group’s tie to the land by leaving signs for others to find. This could be something as simple and ephemeral as the creation of a small fire but could also include the construction of stone cairns and the execution of rock art. It is also possible that it may have been important for people to climb into high mountain areas as a way of mapping their territory (Mierendorf 1986:97). Without the existence of maps, views from high areas would be the only way to see how features of the landscape are linked together.

Many aboriginal groups revere mountain areas as highly spiritual places. Puberty rituals for Nlaka’pamux boys involved solitary excursions high into the mountains for up to ten days at a time where they would become purified through “fasting, sweating, and praying until he gained the desired knowledge” (Teit 1900:318). Teit (1900:338-340) notes that many high mountain areas, particularly lakes, streams and passes were believed to be inhabited with supernatural beings and spirits which would sometimes preclude these areas from being used. Similarly, “little people” were believed to inhabit mountain forests, although these were considered harmless (Teit 1900:340). It was often necessary to provide offerings when hunting in certain mountain areas and women would sometimes have to paint their faces red before picking berries or fishing in the mountains (Teit 1900:344). The Stó:lō still use mountain areas as part of their winter dancing rituals and have identified one mountain in their territory as a transformer site (Mohs 1994). These types of mountain use would leave very little which would last into the
archaeological record with the exception perhaps of small sweatlodge depressions, culturally modified trees (sometimes twisted to mark an area), or rock art.

A final possible use of mountain areas, particularly within the study area concerned here, is the extraction of important rock and mineral resources such as knappable stone and salt, both of which are found in the North Cascades (Mierendorf 1998; Smith 1988). Of particular importance is the presence of Hozomeen Chert, the dominant lithic found in archaeological sites in the region. Quarry sites such as this should display dense flake and core scatters and battered bedrock surfaces.

3.5 Euro-American History

European presence in the study area region began with the initiation of the fur trade, followed by various gold rushes and finally settlement. The community of Hope, which represents the closest large settlement in the area, sits on the original site of Fort Hope, the third Hudson’s Bay Company fort established on the Fraser in 1849 after Fort Langley (1827) and Fort Yale (1848). Fort Hope took over much of the business from that of Fort Yale which fell into disuse approximately the same time that Fort Hope was established (Dahl 1971:11). Although not a regular trading post, Fort Hope supplied the regular pack trains which ran between it and Fort Kamloops with its Fraser River Brigade Canoes (Dahl 1971:11).

Change came swiftly to Fort Hope with word that gold had been discovered. For some time the Hudson’s Bay forts attempted to stifle the discovery of gold by simply buying gold brought to them by the Indians out of a concern that it might affect their lucrative fur business (Dahl 1971:13). In 1858, however, the same year British Columbia became a crown colony, Governor James Douglas sent 800 ounces of this stored gold from the Fraser and Thompson Rivers to the San Francisco Mint. Thousands of people traveled to the Northwest to find their
fortune. Arriving at Bellingham Bay and Fort Langley by every kind of vessel imaginable, these gold seekers began the perilous overland routes to the Interior. Fort Hope naturally became one of the major suppliers for the prospectors and the builders of the Cariboo road to the goldfields around Barkerville. The enormous influx of miners brought with it a devastating change for the Stó:lō who lived in the area, displacing them from many of their traditional resource areas and introducing destructive goods such as liquor (Carlson 1997).

Gold mining, while much more limited than that which was taking place along the bars of the Fraser, was also undertaken in the Cascades area around Silverhope Creek and the Upper Skagit Valley. The most infamous gold strike, however, proved to be a hoax. In 1910 two Americans, Dan Greenwalt and W.A. Stevens, shot-gunned gold brought from Nevada into Shawtum Mountain creating the mini gold rush of “Steamboat Mountain” as they called it. This small, but concentrated rush saw the establishment of over 1200 claims and the sudden appearance of a small bustling town replete with a saloon, hotel, barbershop, assay office, outfitters and a trading post. Assay later revealed the fraud and the town quickly died, however, not before the entire country from Steamboat to the Fraser was staked (Hope and District Historical Society 1984:100).

The community of Hope also acted as supply base for the British Boundary Commission teams which surveyed the area between 1858-59. Most of these parties which traversed back and forth over the Cascades employed local Stó:lō who were familiar with the trails and food resources of this mountainous region (Wilson 1866, 1970). Many of the earliest historic sites in the high mountain areas of the North Cascades are attributed to these parties.

The site of Hope is located at the centre of various important historic trail systems associated both with the Fur trade and early mining. These include the Dewdney Trail running along Nicolum Creek and the Skagit River before heading east towards Princeton; the Hudson’s Bay Company Trail which ran along the Coquihalla River, Peers Creek and then east to
Princeton via the Tulameen River; the Whatcom trail which came from the United States along the Skagit River; and the Hope Trail which left the Skagit river and headed north up Skaist Creek. The trail heading up to Galene Lakes was made by and actually named for an ore mining company (The Galene Ore Company) believed to have worked in the area in the early 1900s (B.C. Parks, pers. comm. 1997). Two tent frame foundations and an old stove at the second Galene Lake are believed to have been associated with this company.

The most profound and obvious historic impact on the landscape surrounding the study area has resulted from logging and the flooding of Ross Lake. Essentially all of the lower areas in this region have been logged in the past as evidenced by numerous spring-board cut stumps and old roads. What was to be the Ross Lake basin was logged prior to its inundation on both sides of the border in the early 1950s. To support the logging a road was built to the head of Ross Lake from the community of Hope at this time.

Today the study area falls within Skagit Valley Provincial Park, and as such is protected from any further human impact with the exception of disturbance from recreational users. This impact has been fairly severe around the second Galene Lake in the form of refuse accumulation and denuding of vegetation.
Chapter 4:

Physical Environment of Study Area

The study area concerned here is situated near the northern extent of the North Cascade Mountains, specifically in the Skagit Range located to the west of the Skagit and south of the Fraser Rivers. This mountain environment is one of extremes where terrain and climate vary abruptly. The numerous and diverse landforms of the North Cascades are the culmination of a unique environmental setting affected by both maritime and interior patterns of climate and a relatively brief, but complex, geological history.

Peaks in the Cascades rise dramatically above nearby valley floors with vertical gains of 2000 m over distances as little as 5000 m not considered unusual (Post 1971). In the immediate study area a rise of 1559 m over a distance of only 4200 m is noted (i.e., from the Skagit River to Wright Peak) resulting in an average slope of 37%.

The study area situated around the subalpine Galene Lakes drains into the Skagit River located approximately 5 km to east of the lakes. Feeder creeks into the Skagit include Galene Creek, International Creek to the south, McNaught Creek to the north, and Nepopekum Creek to the east of the Skagit just north of the surveyed area. The Skagit River ultimately spills into the Pacific Ocean near Mount Vernon in Washington State. The Fraser River is located approximately 50 km to the northwest at Hope and drains the very northern portion of the Skagit and Hozomeen ranges. Silver Hope Creek which drains into the Fraser provides the easiest route into the study area with its headwaters marking the divide into the Skagit watershed via the Klesilkwa River. Ross Lake which spills just across the international border into Canada is the result of a series of dams constructed on the Skagit River beginning in the 1920s.
4.1 Geomorphology and Geology

The immediate study area is one of extreme relief containing narrow ridgelines, avalanche chutes, active talus and scree slopes, jagged peaks, and strongly sloping meadows and bowls, punctuated with deeply incised fast-flowing creeks and a series of cyclopi-Stepped cirque11 lakes (Galene Lakes) which represent the central focus of the survey. The vertical nature of the study area creates a dynamic environment of constantly moving rock, ice, water, and earth which continue to shape landforms every year.

4.1.1 Glacial History

All parts of the study area have at one time or another been covered with glacial ice, the last such occurrence, although relatively minor, taking place between the 15th and 19th centuries.12 While several episodes of glaciation are believed to have taken place in the Pacific Northwest, this chapter will focus on the last major event known as the Fraser Glaciation, the end of which coincides with that of the Pleistocene Epoch. This latest major glacial period is believed to have begun sometime between 22,000 and 19,000 years ago and ended at the beginning of the current inter-glacial period known as the Holocene approximately 10,000 years ago (Booth 1987; Ryder and Clague 1989; Mann and Hamilton 1995).

The Fraser Glaciation has been divided into three main stades termed from earliest to latest: “Coquitlam”; “Vashon” and; “Sumas” (Booth 1987). One named interstade termed the “Port Moody” is also used (Mann and Hamilton 1995). These stadial and interstadial periods describe the various waxing and waning events of the Cordilleran Ice-Sheet which covered much of British Columbia, northern Washington, and the southern portions of the Yukon and Alaska. At its peak between 14,500 and 15,000 years ago this massive ice-sheet is believed to have been
as much as 2.5 km thick effectively covering all but the highest peaks in the North Cascades (Armstrong 1981; Clague 1981, 1989; Pielou 1991; Souch 1989). After 14,000 years ago the ice-sheet melted quite rapidly with the exception of minor readvances such as the Sumas Stade between 11,700 and 11,100 years ago (Booth 1987; Ryder and Clague 1989; Mann and Hamilton 1995). Glacial ice, with the exception of the alpine glaciers which exist today, is generally believed to have left the Pacific Northwest by around 10,000 years ago with the Fraser lowland becoming ice-free some time before (Booth 1987; Ryder and Clague 1950). An age of "Neoglaciation" was evident world-wide beginning around 5000 years ago represented locally by the Garabaldi phase of this age (Pellatt 1996). A glacial advance in the Coast Mountains termed the Tiedemann occurred between 3300 and 1900 years corresponding more or less with the Peyto and Robson advance in the southern Rocky Mountains between 3100 and 2500 years ago (Pellatt 1996). These local advances did not appear to affect the study area specifically; however, many of the mountain glaciers in the North Cascades grew again measurably during the "Little Ice-Age" between 150 and 400 years ago, perhaps reaching their greatest size in over the last 4000-4500 years (Porter et al. 1983 in Mierendorf et al. 1998). This would have affected areas primarily in the current alpine or krummholz zones; and would have covered and likely destroyed any archaeological evidence which may have existed in these areas. The lack of current glaciers in close proximity to the immediate study area suggests that such late disturbance is not a concern in the case of the Galene Lakes area.

The massive Cordilleran Ice-sheet moved more or less continually over the landscape; growing in one area and shrinking in another, during which time it exacted a devastating and profound affect on the earth surface beneath it. The vast majority of the landforms seen in British Columbia today are the result of this scouring effect, as well as the dynamic hydrological processes which immediately followed it. Evidence of this glacial history is shown by the cirque basins such as those which hold the Galene Lakes, surrounding heavily serrated peaks and ridges.
and the deep U-shaped valley through which the Skagit runs (Fleischner and Weisberg 1993:10). Lower peaks which were completely over-ridden by ice at the glacial maximum are more rounded and dome-shaped (Holland 1976). Other rock features formed by glacial movement in the higher alpine areas include aretes, cols, and horns (Mierendorf et al. 1998:13-14). Depositional glacial landforms which occur in the North Cascades include moraines, solifluction lobes and terraces, protalus ramparts, among others (Mierendorf et al. 1998:95).

Geological dynamics associated with the steep terrain continue to modify existing landforms through erosional processes including solifluction, soil creep, and the basic downslope movement of various materials. Annual meltwater episodes, wind and frost also contribute to the erosion and redistribution of landforms.

4.1.2 Bedrock Geology

The North Cascades are considered to be relatively young mountains having been thrust upward sometime in the Mesozoic Era (225 million to 65 million years ago). The layers of sedimentary rock, sandstone and shale which comprised the original mountains, however, were formed early in the Paleozoic Era (575 million to 270 million years ago) at which time a great sea covered North America (Staatz et al. 1972). This combined with later metamorphic processes including volcanism and fault dynamics (see Miller and Bowring 1990) have created a rather complex geological history including the formation of a diverse array of exposed bedrock, some portions of which were actively sought by aboriginal people for the production of tools.

The Hozomeen Lithic Group is most important to the study area as it contains a variety of quartz which has been locally termed "Hozomeen Chert". This rock type, while not ideal, has been used in the past for stone tools and is evident in numerous sites throughout the North
Cascades area (e.g., Bush 1997; Mierendorf 1993, Mierendorf et al. 1998, Rousseau 1988). Hozomeen Chert was observed during the survey both in archaeological contexts as well as in its natural form. Other rocks within the Hozomeen Group include a large amount of greenstones with lesser amounts of chert, argillite and mafic intrusions (Staatz et. al 1972 in Mierendorf et al. 1998). These greenstones are generally too soft to have been suitable for stone tools.

4.2 Climate and Vegetation

Climate and associated vegetation have changed and cycled continually, undergoing many successions over geologic time. Of concern here, however, is only the period over the last 10,000 years known as the Holocene as this was when the study area was most suitable for human occupation (i.e., it was more or less ice-free). As climate and vegetation are linked, the existence of one can be used to infer the other. The reconstructions presented below are the result of paleobotanical analyses including palynology and the examination of plant macrofossils such as fossil logs and stumps. A third line of evidence used in determining the following reconstructions is from the study of fossil chironomids (flies).

A strong warming trend is believed to have occurred in southwestern British Columbia by 10,000 years BP (Mathewes 1973, 1985; Warner 1984; Pellatt and Mathewes 1994; Hebda 1995). This rapid warming marks the start of the Holocene, the period in which we live today. The Holocene is divided into three broad periods of differential climate, starting with conditions which were warmer and drier than today known as the “Xerothermic Period”, followed by a mid-Holocene period which was warmer than today with equivalent moisture termed the “Mesothermic Period”\(^{13}\), and finally the cool, moist modern climate we experience currently know as the “Neoglacialation” (Mathewes and Heuser 1981; Porter and Denton 1967; Hebda 1995). Some researchers also believe that a minor cooling event termed the “Younger Dryas”
may have occurred just before the beginning of the Holocene between 11,000 and 10,000 years BP (Mathewes 1993; Mathewes et al. 1993; Peteet 1995). Such an event may have made the use of higher areas difficult or impossible during this time. Similarly, during the “Little Ice-Age”, occurring between 150 and 400 years ago, when mountain glaciers reached their greatest extent during the Holocene (Porter et al. 1983; Pelatt 1996), human use of many portions of the North Cascades would have been compromised.

These periods and phases of climate corresponded with specific changes in vegetation both in lowland and mountain areas. Of particular concern to this project is the shift in treeline which was higher in warmer times and lower in cooler (Pellatt 1996; Pellatt et al. 1998). This would have influenced human land use patterns greatly, as subalpine and alpine resource amounts and locations changed over time. The North Cascades have seen rather dramatic shifts in treeline over the last 10,000 years. During the early and middle Holocene when it was measurably warmer (the Xerothermic and Mesothermic) the treeline from one test site location on Mount Stoyama in the North Cascades appears to have been at least 100 m higher than it exists today (Pellatt 1996; Pellatt et al. 1998), a significant amount if one considers the vertical micro-environment of mountains. Pellatt (1996) notes that treeline shifted downward again during the Neoglaciation about 5000 years ago, advanced again after 3000 years, and was forced downward again at the time of the Little Ice Age between 150 and 400 years ago. Treeline has advanced somewhat again over the last 150 years attributed not only to natural climatic cycling but also to the anthropogenic greenhouse effect (Pellatt 1996). This has likely swallowed up recently open areas which could have been used for berry collection and processing in the recent past.
4.2.1 Modern Conditions

Two main biogeoclimatic zones exist in the surveyed area; Mountain Hemlock (MH) and Alpine Tundra (AT) (Meidinger and Pojar 1991). They are divided by a patchy krummholz depending upon the aspect and elevation of a particular area. This krummholz zone shares characteristics of both zones and is characterized primarily by stunted tree growth.

Mountain Hemlock zone

The MH biogeoclimatic zone is considered to be the characteristic subalpine environment of coastal British Columbia and is found at elevations from 900 to 1800 m asl (Meidinger and Pojar 1991). In the North Cascades it is divided into two zones, a lower closed canopy forest, and an upper parkland zone interspersed with subalpine meadows (Fleischner and Weisberg 1993:14). This MH parkland is found in much of the study area particularly around the second Galene Lake (Camp Lake). The MH zone has cool, short summers and cold, long, wet winters with a deep snowpack (Brooke et. al 1970; Pojar and Klinka 1983; Meidinger and Pojar 1991). The amount of snow and precipitation differs significantly from west to east due to the rainshadow provided by the high Pickett and Chilliwack Ranges (Mierendorf et al. 1998). A wet to dry gradient is also seen moving from south to north during the late spring to early fall period as climate becomes more heavily influenced by interior systems (Mierendorf et al. 1998). Mean annual temperature in the MH zone varies from 0 to 5°C with average monthly temperatures below 0°C for one to five months and above 10°C for 1 to 5 months (Meidinger and Pojar 1991).

As the MH zone becomes more continental, as is apparent in the study area, it begins to grade into the Engelmann Spruce Subalpine Fir (ESSF) zone (Pojar and Klinka 1983). Subalpine fir (Abies lasiocarpa) and Engelmann spruce (Picea engelmannii) were noted in many
parts of the subalpine portions of the study area often mixed in with western hemlock (*Tsuga heterophylla*) and mountain hemlock (*Tsuga mertensiana*) in parkland areas. Understorey vegetation is dominated by heaths comprised of low evergreen shrubs of the heather family. These springy heaths survive, in part, because of the long soaking they receive from the slow melting annual snowpack.

*Alpine Tundra zone*

The Alpine Tundra (AT) Biogeoclimatic zone occurs only in the very highest portions of the study area. It is generally considered to be the area that lies above treeline; however, treeline does not have a consistent break throughout and is often punctuated with small patches of krummholz. This is a reflection of the complex nature of the alpine ecosystem where aspect, elevation, slope, wind exposure, and snow accumulation dictate true climax stands. Biogeoclimatic maps, in the absence of ground truthing for these areas, should be considered to be guidelines only (see Chapter 5, Figure 12 for the true distribution in the study area).

Common trees found in the patchy krummholz surrounding the AT zone include mountain hemlock (*Tsuga mertensiana*), subalpine fir (*Abies lasiocarpa*), and whitebark pine (*Pinus albicaulis*) (Pellatt 1996), all of which were noted during the survey. Dwarf shrubs, herbs, lichens and bryophytes dominate the vast percentage of AT Zone areas. The whitebark pine (*Pinus albicaulis*) observed in the study area represents the northernmost reaches of this species in the Cascades, with larger amounts found in alpine areas of the Coast Range (Pojar and MacKinnon 1994).

Average temperatures in the AT zone are below freezing for seven to eleven months of the year allowing for very limited soil development (Pojar 1983 b; Meidinger and Pojar 1991).
Snowpack in the AT zone is not as deep as in the subalpine as it is often blown away by strong winds settling in areas where trees can hold it in the subalpine.
Chapter 5:
Survey Methodology

This chapter outlines the methods which were anticipated being used before entering the field, how these methods were modified upon entering the field, and finally provides suggestions for improving future survey projects in mountain environments.

5.1 Surface Reconnaissance

Most archaeological surveys in British Columbia employ a pedestrian reconnaissance of a project area in as systematic a fashion as terrain and budget will allow. This normally involves the spacing of crew members at regular distances who then move back and forth over the study area in more or less straight lines. Within large study areas intensively surveyed quadrats are sometimes used in order to obtain a statistical sample of a general region (e.g., Alexander and Matson 1987). As my survey in the Galene Lakes area was comprised of only 1000 ha of generally very steep terrain, it was not deemed necessary nor practical to layout quadrats in order to achieve intensive survey coverage. In my permit application(s) to the various groups with an interest in the survey (i.e., Archaeology Branch, BC Parks, Stó:lō Nation) I stated that though “ideally traverses will be spaced no more than 20 m apart...this may not be achievable in such a steep environment.” The latter qualifying statement proved true and the methodology diverged considerably.

There are few level areas in the study area and those which do occur are separated by substantial changes in elevation. Survey concentrated generally on the easiest routes between such areas becoming systematic once again upon arriving in areas sloping generally less than 40% (see Figure 11). Traversing back and forth systematically over very steep areas involves herculean effort and is probably not necessary. It seems reasonable to assume that these very
steep areas likely contain very little or no archaeological residues so their exclusion does seem valid. It is unlikely that slopes where it is almost impossible to stand had any type of repeated use. If a complete systematic search of the entire ground surface within the study was to be achieved it would have involved considerable time (several months) not to mention possible injury. Areas chosen had to take into account the time necessary for the crew to travel to a new area, spend an appropriate time surveying the area, and then returning to base camp. The amount of physical energy required for some of these sorties was at times great and became the prime factor considered during the evening planning of the next day’s work. Considering such logistics, however, helped develop an understanding of what it must have been like to use such an environment and indirectly focussed the survey on areas with greater archaeological potential.

Ridgelines provided the most common travel route for the survey crew. While these themselves were often steep, they usually held short sections of animal paths (most from bears) making their ascent and descent easier (see Figure 11).

In those few areas of less than 40% slope, traverses were placed very tightly together if not shoulder to shoulder. Cultural evidence sought included both artifacts such as lithics, and features such as plant processing pits, cache pits, cairns, blinds, culturally modified trees, and rock art. Essentially any part of the landscape which exhibited human use either through modification or the presence of artifacts was sought.
Figure 11. Study area showing areas intensively covered during the survey as well as the routes most often followed (1:20,000; TRIM 92H.005).
There are three main environmental areas found in the study area (Figure 8) each which was surveyed in a slightly different fashion. These are as follows:

(1) **ALPINE AND KRUMMHOLZ**: That area which includes either no trees or few stunted trees (see Figure 12).

- **Survey Style**: Concentration on ridge lines, moderately sloping meadows, and cliff faces (investigated for possible rock art and/or rock shelters). Survey crew often followed a linear pattern.
- **Survey Intensity**: Those areas which could be walked without falling. Slopes over 60% were generally not traversed.
- **Equipment Used**: (1) Trowel for subsurface testing. (2) 3 mm screen to pass matrix through. (3) Soil probe (2 cm) for subsurface matrix sampling. (4) Rock probe used to discern subsurface rock patterns. (5) 1:20,000 scale topographic map. (6) GPS unit.
- **Comments**: Generally easy to move through this area as there are few obstructions, however, elevation gains can easily tire a crew out limiting survey amount and probably effectiveness near day’s end. Ground exposure is generally very good reducing the amount of subsurface testing required. Exposures offered by animals paths, erosion, and bedrock surfaces with little or no soil development. Generally very easy to navigate as open vistas allow to see where one has been/is going.

(2) **SUBALPINE PARKLAND**: That area which includes small patches of trees just below the alpine (see Figure 12).

- **Survey Style**: Most of this terrain can be easily surveyed, however, some is still very steep and difficult to walk. Trees give added support when climbing up steep slopes. Survey pattern not as linear as in alpine.
• **Survey Intensity:** Concentration on ridgelines, around lakes, and at treeline margins. Slopes over 60% were generally not traversed.

• **Equipment Used:** (1) Trowel for subsurface testing. (2) 3 mm screen to pass matrix through. (3) Soil probe (2 cm) for subsurface matrix sampling. (4) Rock probe used to discern subsurface rock patterns. (5) Increment corer for dating trees. (6) 1:20,000 scale topographic map. (7) GPS unit.

• **Comments:** Area can be difficult to survey in places due to steepness and growth of slippery plant species such as Indian hellebore. Ground exposure is far less than in alpine making subsurface testing more necessary. Available water reduces the amount each surveyor needs to carry.

(3) **SUBALPINE:** That area which is entirely treed (see Figure 12).

• **Survey Style:** Survey pattern is more spread out than in parkland or alpine. Steep terrain still tends to create a linear pattern in some areas.

• **Survey Intensity:** Concentrated around lakes and along trail areas connecting lakes. A general lack of differentiation in the landscape made systematic traverses in some areas necessary.

• **Equipment Used:** (1) Trowel for subsurface testing. (2) 3 mm screen to pass matrix through. (3) Soil probe (2 cm) for subsurface matrix sampling. (4) Rock probe used to discern subsurface rock patterns. (5) Increment corer for dating trees. (6) 1:20,000 scale topographic map. (7) GPS unit (not effective in many areas due to dense forest canopy).

• **Comments:** Dense vegetation combined with steep terrain makes survey difficult. Ground exposure is basically non-existent except in the form of tree throws. Shovel testing is necessary in all areas. Water available in most areas and is not necessary to
Figure 12. Distribution of true alpine, subalpine parkland, and subalpine in the study area (1:20,000; TRIM 92H.005).
carry. Difficult to navigate in much of this area due to a largely homogeneous landscape, dense vegetation, and ineffectiveness of GPS unit.

5.2 Subsurface testing

Subsurface testing was conducted in those areas which appeared to have the potential for containing archaeological materials but were not evident on the ground surface. These included level to gently sloping areas around the lakes, natural resting spots along trails, and areas which offered good vantage points. As shovels are difficult to pack in mountain areas, and soil development is generally thin, trowels were used to conduct the tests. Tests did not exceed 30 cm in diameter as a stipulation in my permit from BC Parks. All removed matrix was passed through a 3 mm screen in order to ensure that the majority of cultural material was collected. Tests were dug to the depth at which either sterile deposits were encountered such as glacial till or bedrock, or to a point where further excavation became impossible because of an obstruction such as a large root or rock. Most tests did not exceed 40 cm in depth.

Suspected berry trench features were tested for charcoal deposits using an Oakfield soil probe with a 2 cm diameter bit. This apparatus was placed alongside identified rock lines at the bottom of the trench and adjacent to the mound feature characteristic of berry trenches. Rock patterns were discerned using a custom-made metal spike with a “T” handle.

5.3 Increment Coring

Any culturally modified trees identified were cored to determine the age of the tree and modification. This involved taking a core sample from the scar as well as from the tree itself. The approximate age of the modification was then determined by subtracting the scar age from...
that of the tree. Cores once extracted were placed in plastic straws and labeled with the date of their extraction, the location on the tree or feature from which they were taken, and the temporary site number. Cores were later prepared in the lab using a fine grit (#600) sandpaper and then coated with a wood maintenance oil in order to enhance the annual growth rings. Magnification was required to count the rings in most instances.
Chapter 6:
Survey Results

A total of eight new archaeological sites were recorded during the survey of the Galene Lakes area (Table 4). Site types represented include solitary flakes of Hozomeen Chert (DgRg 5 and DgRg 12), a lithic scatter (DgRg 11), a solitary projectile point (DgRg 7), a Hozomeen Chert quarry (DgRg 10), probable huckleberry processing trenches (DgRg 8 and DgRg 9), and an historic hunting camp (DgRg 6). Culturally modified trees were represented at Sites DgRg 9 (berry trench site), and also at DgRg 6 (historic camp). Historic component features are found at Sites DgRg 8 (berry trench site) and DgRg 11 (lithic scatter site).

Table 4. Sites identified during the survey of the Galene Lakes area.

<table>
<thead>
<tr>
<th>Site</th>
<th>Components</th>
<th>Elevation</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>DgRg 5</td>
<td>Single Hozomeen Chert uniface (surface)</td>
<td>1982 m asl</td>
<td>Alpine</td>
</tr>
<tr>
<td>DgRg 6</td>
<td>Historic hunting camp culturally modified tree</td>
<td>1829 m asl</td>
<td>Subalpine Parkland</td>
</tr>
<tr>
<td>DgRg 7</td>
<td>Single projectile point mid-section (subsurface)</td>
<td>1600 m asl</td>
<td>Subalpine</td>
</tr>
<tr>
<td>DgRg 8</td>
<td>Berry trench/chert flake (subsurface)/historic trail</td>
<td>1620 m asl</td>
<td>Subalpine Parkland</td>
</tr>
<tr>
<td>DgRg 9</td>
<td>Berry trenches/culturally modified trees</td>
<td>1798 m asl</td>
<td>Subalpine Parkland</td>
</tr>
<tr>
<td>DgRg 10</td>
<td>Hozomeen Chert quarry</td>
<td>1867 m asl</td>
<td>Alpine</td>
</tr>
<tr>
<td>DgRg 11</td>
<td>Lithic scatter/historic tent platforms and refuse</td>
<td>1737 m asl</td>
<td>Subalpine Parkland</td>
</tr>
<tr>
<td>DgRg 12</td>
<td>Single Hozomeen Chert flake</td>
<td>1661 m asl</td>
<td>Subalpine Parkland</td>
</tr>
</tbody>
</table>
6.1 Site DgRg 5

This site consists of a single Hozomeen Chert uniface located on the surface of a high ridge just south of the main ridge leading to Wright Peak (Figures 13 through 15). This location represents the highest point of land for some distance (1982 m asl) and offers a panoramic view of the surrounding landscape. The site falls within the true alpine with the only nearby trees consisting of a few scrubby whitebark pine.

Not enough material was identified at the site to suggest what function it might represent. It may be a solitary artifact dropped or discarded by someone moving through the area during a hunting or plant gathering excursion or perhaps returning from the nearby Hozomeen Chert quarry (Site DgRg 10; Section 6.6). The location of the site is a natural resting spot along the route leading to Wright Peak. Because of this it is possible that modern recreational users may have collected more recognizable artifacts from the site. No subsurface tests were conducted at DgRg 5 as ground exposure was excellent along the ridge. The single artifact was left in situ at the site.
Figure 13. Location of sites identified during the survey (1:20,000; TRIM 92H.005).
6.2 Site DgRg 6

This site is located at the southeast corner of the upper Galene Lake (Figures 13, 16 and 17). It consists of a small historic scatter of tin can and glass bottle fragments as well as a single scarred subalpine fir. This tree appears to have been chopped with an axe to gather kindling material.

The tin can fragments are of the folded seam variety which are not known to pre-date ca. 1910 and rarely postdate 1940. Bottlenecks observed also appear to fall within the same age range. An increment core of the scarred fir produced a date of 1926 and could therefore be associated with the cans and bottles. A single 303 “British” caliber rifle shell observed on the
surface could also date to the same time period as this rifle was available just prior to WW I; however, the same ammunition round is still widely used today. It is believed that the site probably represents an historic hunting camp. Its location provides a very good view of a steep game trail down to the water on the south side of the lake and is partially concealed by a stand of mature subalpine fir and mountain hemlock. This trail is used by mountain sheep, goat, and mule deer. It is quite possible that the same location was used for hunting in precontact times; however, shovel tests conducted in the area did not produce any cultural material. No artifacts were collected from the site.

Figure 16. View of Upper Galene Lake and identified Historic Site DgRg 6 (arrow), looking northeast.
Figure 17. General plan map of identified Site DgRg 6 at Upper Galen Lake.
6.3 Site DgRg 7

This site consists of a single basalt projectile point midsection identified in a shovel test near the 3rd Galene Lake (Sunglass Lake; Figures 13, 18 and 19). The site is situated on a small outwash terrace in the northeast corner of the lake. The area surrounding this small flat is typified by steep, rough terrain including cliffs and talus slopes. While the site is located in a small clearing, the area is densely forested with stands of subalpine fir and mountain hemlock. Five other shovel tests conducted in the site area did not recover any further cultural material. This artifact was probably broken and then lost or discarded during a single hunting episode.

The projectile point mid-section does not have any diagnostic characteristics which could reveal its relative age with the exception that it appears to be too large to fall into the later dating side-notched category. It more likely is associated with the preceding corner-notched phase dating sometime before 1000 years BP.

Figure 18. View towards identified Site DgRg 7 and the 3rd Galene Lake, looking north.
6.4 Site DgRg 8

The site consists of three main, unassociated components: a possible berry processing (drying) trench; a small subsurface lithic scatter, and historic stumps believed to be associated with trail construction and perhaps early mining exploration (Figures 13 and 20).

The possible berry drying trench is similar to features which have been recorded in the recent past in southern and central Washington State (Mack 1989, 1992). It is among the first such trenches to be recorded in Canada (DgRg 9; [see Section 6.5] and DgRg 18 [see Section 2.2.2] represent the only other known berry trench sites in Canada to date). The drying process (as described in Filloon [1952]; Mack [1992a]) involved the excavation of a shallow, sloping trench opposite either an intentionally or naturally downed tree. The mound of dirt from the
excavation was piled up opposite the downed tree along the other side of the trench. Huckleberries (usually only huckleberries) were then spread out along thule mats which were held down with a continuous line of stones along the bottom and sides of the mats. The tree was then set on fire and the heat would dry the berries. The tree was extinguished after the process was completed and was believed to be revisited annually. With time the tree would rot and fall into the trench and the mound along the edge begin to slump and flatten. The trench identified during this investigation does contain a somewhat continuous line of stones along the bottom and sides, as well as the characteristic layer of charcoal adjacent to the rocks from the burning tree.

The rocks were identified using a thin metal probe and the charcoal through the use of a 2 cm "Oakfield" sediment coring tool. The trench identified at DgRg 8 measures 3 x 1 m with a depth of 0.45 m.

The four pieces of lithic shatter were recovered from a single shovel test located just northwest of the trench feature. It is not believed, however, that this component of the site is associated with the trench as the artifacts came from well below the surface (~30 cm BS) and the trench feature is still fairly well defined. The shatter consists of three Hozomeen Chert and a single metasediment piece. It is unknown what the function of these lithic fragments represent, although they probably are the result a single precontact event involving the testing of local lithic materials for possible tool use. The age of this deposit is unknown; however, it is believed to predate the trench feature which is probably proto-historic or historic in age.

The saw-cut tree stumps identified at the site may be associated with early historic trail construction and/or early mining exploration in the area. The small gold rush of "Steamboat Mountain" (Shawatum Mountain) did attract several hundred miners into the area in 1909. It was later discovered that the claim of gold occurring in the area was a fraud created by American speculators who had shotgunned gold imported from Nevada into the mountain (see Section 3.5). The other main historic use of the Galene Lakes area is associated with the surveying of the International border which took place between 1858 and 1859 (see Section 3.5).
Figure 20. General plan map of identified site DgRg 8.
6.5 Site DgRg 9

This site consists of three possible berry processing (drying) trenches, and two kindling-stripped subalpine fir trees (Figures 13, 21 through 23). This particular site was first identified by Mierendorf during a general survey of the area for glassy volcanic materials in 1996 at which time he identified two trench features (Mierendorf 1997). The site was not officially recorded until this survey. The site is located in a small saddle at the toe of a slope along the main ridge leading southwest of the Upper Galene Lake. It is bordered along all sides by quite steep terrain and falls approximately 200 m north of the international border.

The three trench features share characteristics with berry drying trenches found previously in Washington State (Mack 1989, 1992; see Section 6.4). The trenches found at Site DgRg 9 are described below:

**Trench#1:** 3.5 x 0.80 m x 0.40 m (depth). Displays a continuous line of stones along the bottom of the trench as well as up along one side as determined through probing. Coring produced fragments of charcoal and charcoal-stained soil.

**Trench#2:** 3.5 x 1.0 m x 0.30 m (depth). Line of rocks is not obvious and only a small amount of charcoal was recovered through coring.

**Trench#3:** 2.2 x 0.75 m x 0.40 m (depth). Less rectangular than the first two trenches. Probing revealed a fairly continuous line of rocks along the bottom of the trench.

The two culturally modified subalpine fir trees appear to have been stripped for the purpose of obtaining kindling. This kindling may have been required to light the berry drying trees; however these trees may be associated with other historic activities. It is also possible that they may be associated with border survey activities which took place in this area at about this
time (Wilson 1866). It is possible that area could have been used for huckleberry drying at around the same time as the border surveys. Berry drying trenches are believed by some researchers to be a protohistoric and early historic cultural practice when horses would have been available to pack the dried berries down from otherwise difficult to access mountain areas (Burtchard 1998:21). The two culturally modified trees measure as follows:

**CMT#1**: subalpine fir: circum. = 1.96 m; scar begins 1.45 cm above ground; scar length = 55 cm; scar width = 8 cm; scar depth = 7 cm. Increment core on scar produced a date of 1853.

**CMT#2**: subalpine fir: circum. = 1.41 m; scar begins 1.34 cm above ground; scar length = 45 cm; scar width = 9 cm; scar depth = 7 cm. An increment core was attempted but was not successful with this specimen.

A pile of medium-sized rocks (average size ca. 20 cm across) was observed at the foot of the two modified subalpine fir. It consists of about ten rocks piled in a somewhat pyramidal fashion. They have been heavily covered with mosses and lichens since they were piled, suggesting that they have been left for quite some time. It is possible that they are associated with the trenches; perhaps as a stockpile of rocks for holding down the drying mats. This feature could also be associated with the original boundary survey of 1857-59.
Figure 21. Location of Site DgRg 9 (box), looking south.

Figure 22. Trench feature #1 (box) at Site DgRg 9, looking southwest.
Figure 23 General plan map of Site DgRg 9.
6.6 Site DgRg 10

This site is a small pre-contact quarry of Hozomeen Chert located just south of Wright Peak (Figures 13, 24 through 26). The site is situated on a narrow E-W trending ridge which branches off of the main N-S running ridge connecting the Galene Lakes area with Wright Peak. At 1867 m asl, Site DgRg 10 represents the highest known quarry of Hozomeen Chert to date.

At least one hundred pieces of Hozomeen Chert debitage were observed on the ground surface at the site. Eleven such pieces were collected as samples. Unmodified nodules of the chert were also collected. No shovel tests were conducted at the site because of the excellent surface exposure and the fact that there is little or no soil development over most of the site area.

It is believed that this site represents a serendipitous quarry of raw material, probably not used many times throughout prehistory, except for the few times when people happened to be moving through the area. Not enough lithic debitage exists at this site nor is it of sufficient quality to suggest intensive use of the quarry.

Time did not allow for further exploration down the ridge which begins to drop steeply to the east towards Galene Creek and the Skagit River. It is likely that further outcrops of Hozomeen Chert occur along this ridge and should be explored in the future.
Figure 24. Site DgRg 10 with Wright Peak in the background, looking north.

Figure 25. Outcrop quarry of Hozomeen Chert (DgRg 10), looking east.
6.7 Site DgRg 11

This site is located at the second Galene Lake (Camp Lake) which represents the main camping lake for backpackers arriving in the Galene Lakes area (Figures 13, 27 through 30). It is situated essentially at the end of the Galene Lakes Trail up from the Skagit River floodplain. This site was first observed by Robert Mierendorf in 1996 who identified a basalt (or metasediment) uniface while passing through the area during a survey for glassy volcanic materials (Mierendorf 1997). No other archaeological materials were identified by Mierendorf.
The site consists of the single medium-grained basalt (or perhaps metasediment) uniface identified originally by Mierendorf at the southern end of the site and a small amount of chert shatter, and metasediment fragments identified in trowel scrapings on a small bedrock step adjacent to the lake (Figure 28). A scatter of historic refuse from various time periods is also found throughout the area. Two prominent tent platform foundations exist in the east-central area of the site (Figure 29). These were thought to represent cabin foundations initially; however, the ground within them is rocky and unlevel and there is no indication of a floor having once existed (i.e., floor nails, planks). These tent platforms are believed to be associated with early mining exploration in the area by the Galene Ore Company from which the lakes and creek bear their name.

It is unknown exactly what precontact function the site had, however, it is quite obviously a natural draw to people moving throughout the area. The general lack of artifacts in what seems to be an ideal upland location suggests that activities in this area were not frequent or perhaps not often associated with the small lakes.

Figure 27. View of Site DgRg 11 (arrow), looking southeast.
Figure 28. Lithic tools and debitage recovered from Site DgRg 11.

Figure 29. Historic tent platforms at Site DgRg 11.
Figure 30. General plan map of Site DgRg R 11.
This site consists of a single Hozomeen Chert flake located just off of the main Galene Lakes Trail on a high narrow ridge just before the final descent to the 2nd Galene Lake and the main campsite (Figure 13, 31). An outcrop of rather low quality Hozomeen Chert is also located at this location. This chert source can be seen in a seam from the south side of the trail as well as protruding in places through the surface. It is unknown whether the flake came from this source of Hozomeen Chert or from others known in the area. It probably does represent a single event in which an individual tested the raw material found while moving through the area. Trowel scrapings were conducted at the site; however, the ground exposure in this area is excellent. No actual shovel testing was undertaken.
31. General plan map of Site DgRg 12.
Chapter 7:
A Model for Mountain Use of the Study Area

It is difficult to come up with a model for mountain use considering the small amount of data which has been recovered from this area of the Northwest. Most important to such a discussion is whether or not the use of these areas should be considered to be central or marginal to the general subsistence strategy of the aboriginal people which used them. Certainly there were years when it was not possible to access some mountain areas because the snow did not always recede making the use of such areas unreliable. This would have been particularly true during those colder periods of time such as the Little Ice Age 150 to 400 years ago. To complicate the matter, however, there were some users which preferred to be in the mountains during the winter (i.e., the Nlaka'pamux; Collins 1974:14-15, 66; Teit 1900:239). Winter use would leave different archaeological residues in different areas than that found in sites from the more prevalent summer and autumn use.

I believe that the use of mountainous areas was not marginal but a major component of the subsistence strategy for several groups of people at certain times. This is likely particularly so in latter times when horses were available to transport large quantities of resources (e.g., dried berries) out of these difficult to access areas (Burtchard 1998:21). Prior to the horse it is difficult to argue that sufficient resources could be obtained from such areas to justify the energy expended. Of course this assumes that people used the area only for its food resources. Mierendorf (1998:7; 1999:14) argues it may have been important also to use these areas in order to exercise "co-rights" to the same highlands by several different groups. Certainly there is ample ethnographic data to suggest that several different groups likely used the area (see Chapter 3).
It seems reasonable to assume that the use of mountainous areas was affected to some extent by what was occurring in the lowlands. If resources were sparse for one reason or another in the lowlands it is likely to expect that upland areas were probably used more heavily. At least some use, however, likely occurred annually by people from each major group, as familiarity with this highland environment would be essential to economic success within it from year to year. This requisite knowledge of the landscape would not be achievable through serendipitous encounter, but only through repeated use.

During the proto-historic and early historic time period, as traditional lowland resources were becoming less accessible, and trade items more desirable, it is possible that a greater use of subalpine and alpine resources (particularly huckleberries) occurred. This seems to coincide with the emergence of berry drying trenches which do not appear to pre-date 600 years BP and centre around 250 years BP (Mack 1992:12). While an absolute date was not achieved for the trenches identified as part of this thesis (DgRg 8 and DgRg 9; Chapters 6.4 and 6.5), a possible associated modified fir produced a date of 1853 at site DgRg 9. This would place the trenches firmly in the time period when such items were known to be traded at places such as Fort Langley. Unfortunately the Fort Langley journals for this time period are missing; however, the 1827-30 journals mention the trading of dried berries in several places (Maclachlan 1998:31, 66, 83, 184).

The use of mountain areas in earlier times appears to be less intensive, although it obviously did occur in the study area as evidenced by the discovery of a projectile-point midsection found at Site DgRg 7 believed to pre-date 1000 BP (Secion 6.3) as well as five other sites which contained lithics (DgRg 5, DgRg 8, DgRg 10, DgRg 11, and DgRg 12; Chapter 6). None of these sites, however, produced any significant amount of cultural material with the exception perhaps of DgRg 10 (Chapter 6.6) which as a quarry site still cannot be considered to be dense. I argue though that the very presence of these artifacts in such a difficult environment
to access and travel through, suggests that people must have been very familiar with the area in order to survive. It is not the sort of place that one would idly stumble into without a purpose in mind. There is probably a considerable amount of material that also has been lost due to decomposition as well as redistribution. Many activities, especially plant gathering, would have left very little, if any, archaeological residues.

Adding to the difficulty of modelling upland areas is the change in treeline (see Chapter 4.3). Most resources in the subalpine and alpine are found near treeline which provides shelter for both people and animals, as well as fuel. Meadows adjacent to treeline or in the krummholz provide safe grazing for ungulates as well as supply a great deal of berries which can be dried using nearby downed trees. The recent creep upward in treeline has probably obscured much of the archaeological evidence which once existed in this transitional area. The single projectile point found at Site DgRg 7 (Chapter 6.3) for instance was likely deposited when the area was truly alpine or transitional; however, it now sits solidly in a subalpine stand. Trenches which at one time were probably located in open areas adjacent to treeline likely also have been taken over by trees where they lay hidden and difficult for an archaeologist to find. Modelling must take these factors into account. Areas which are treed today were at one time either alpine or situated much closer to treeline. Only intensive and difficult subsurface testing can reveal such sites; something which most archaeologists do not have the time or patience for. Treeline transitional areas are probably the easiest areas to investigate as they were also used by aboriginal people; however, the densest site areas may be located in what is now thick subalpine bush.

As mentioned earlier some groups used the mountainous areas of the Northwest during winter; however, it is more than likely that such use was probably not the norm. If one looks at the seasonal availability of various plants and animals (Table 5 below) it is obvious that summer and autumn were the most desirable times to be in highland areas as the most resources were
Table 5. Harvest times of plant and animal resources in the study area (Adapted from Tables 2 and 3)

<table>
<thead>
<tr>
<th>Season</th>
<th>Plants</th>
<th>Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>avalanche lily</td>
<td>Grizzly Bear</td>
</tr>
<tr>
<td></td>
<td>chocolate lily</td>
<td>porcupine, squirrel</td>
</tr>
<tr>
<td></td>
<td>common horsetail</td>
<td>Black Bear</td>
</tr>
<tr>
<td></td>
<td>cow parsnip</td>
<td>Coyote</td>
</tr>
<tr>
<td></td>
<td>fireweed</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>glacier lily</td>
<td>Grouse</td>
</tr>
<tr>
<td></td>
<td>mountain sorrel</td>
<td>Ptarmigan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fisher, hare, lynx, marten</td>
</tr>
<tr>
<td>Summer</td>
<td>avalanche lily</td>
<td>Deer</td>
</tr>
<tr>
<td></td>
<td>black goosberry</td>
<td>Grouse</td>
</tr>
<tr>
<td></td>
<td>black huckleberry</td>
<td>Elk</td>
</tr>
<tr>
<td></td>
<td>black tree lichen</td>
<td>Mountain Goat</td>
</tr>
<tr>
<td></td>
<td>bog blueberry</td>
<td>Merlot</td>
</tr>
<tr>
<td></td>
<td>Cascade huckleberry</td>
<td>Alpine</td>
</tr>
<tr>
<td></td>
<td>chocolate lily</td>
<td>Coyote</td>
</tr>
<tr>
<td></td>
<td>common horsetail</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>common juniper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cranberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dwarf blueberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dwarf huckleberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>five-leaved bramble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>glacier lily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>great camas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>groseberrry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>huckleberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian nehebore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mountain sorrel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>salmonberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yellow cedar</td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td>beaked hazelnut</td>
<td>Deer</td>
</tr>
<tr>
<td></td>
<td>black goosberry</td>
<td>Elk</td>
</tr>
<tr>
<td></td>
<td>black huckleberry</td>
<td>Grizzly Bear</td>
</tr>
<tr>
<td></td>
<td>black tree lichen</td>
<td>Black Bear</td>
</tr>
<tr>
<td></td>
<td>bog blueberry</td>
<td>Mountain Goat</td>
</tr>
<tr>
<td></td>
<td>Cascade huckleberry</td>
<td>Alpine</td>
</tr>
<tr>
<td></td>
<td>chocolate lily</td>
<td>Merlot</td>
</tr>
<tr>
<td></td>
<td>common horsetail</td>
<td>Ptarmigan</td>
</tr>
<tr>
<td></td>
<td>common juniper</td>
<td>Fisher, hare, lynx, marten</td>
</tr>
<tr>
<td></td>
<td>cranberry</td>
<td>Porcupine, squirrel</td>
</tr>
<tr>
<td></td>
<td>dwarf huckleberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>five-leaved bramble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>glacier lily</td>
<td></td>
</tr>
<tr>
<td></td>
<td>groseberrry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>huckleberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian nehebore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mountain sorrel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>salmonberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yellow cedar</td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td>black tree lichen</td>
<td>Deer</td>
</tr>
<tr>
<td></td>
<td>common juniper</td>
<td>Elk</td>
</tr>
<tr>
<td></td>
<td>cranberry</td>
<td>Grizzly Bear</td>
</tr>
<tr>
<td></td>
<td>dwarf huckleberry</td>
<td>Black Bear</td>
</tr>
<tr>
<td></td>
<td>five-leaved bramble</td>
<td></td>
</tr>
<tr>
<td></td>
<td>glacier lily</td>
<td>Coyote</td>
</tr>
<tr>
<td></td>
<td>groseberrry</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>huckleberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian nehebore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mountain sorrel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>salmonberry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yellow cedar</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Table 5 shows the harvest times of plant and animal resources in the study area, adapted from Tables 2 and 3. The plants and animals are categorized by season, with specific harvest times provided for each. The animals listed include Grizzly Bear, porcupine, squirrel, Black Bear, Coyote, Fox, Grouse, Fisher, hare, lynx, marten, Ptarmigan, and woodpecker, other birds.
available at this time. This was also the only time when the area was not completely inundated with snow. This was the time of year when the highly sought after mountain huckleberry was ripe, large ungulates began to mass together, and rodents such as marmots were not in hibernation. While certain strategies such as running down animals in the snow could only have been undertaken in winter, I believe that the resources available in the late summer and autumn far outweigh such advantages.

Resources unique to the uplands could have attracted people in any year regardless of whether there were surpluses of more common resources in lowland areas. These resources are not affected by the so-called “Optimal foraging strategy” as proposed for such regions by Schalk (1988), among others. Such unique mountain resources would have included huckleberries (especially such species as the super-sweet Cascade huckleberry [Vaccinium deliciosum]) as well as Hoary Marmot (Marmota claigata), Mountain Goat (Oreamnos americanus) and Hozomeen Chert. These items would have held great trade value as well as obvious dietary and utilitarian value. There is considerable evidence in upland areas of nearby Vancouver Island for example that marmots (in this case Vancouver Island Marmots [Marmota vancouverensis]) were enthusiastically sought both for their excellent meat and desirable pelts (Nagorsen et al. 1996).

Exactly where the sites identified during this survey fall is difficult to determine. I do believe that many areas where these sites were found have changed considerably with respect to treeline. Unfortunately none of the sites can be firmly dated so it is difficult (impossible) to model for paleoclimate and the corresponding treeline. In addition, the recent shift in treeline over the last 250 years has changed many of their settings. Table 6 below lists the sites identified, their current environmental context, and the context they were likely in 250 years ago.
Table 6. Context of sites identified during survey.

<table>
<thead>
<tr>
<th>Site</th>
<th>Type</th>
<th>Landform/Context</th>
<th>Current Zone</th>
<th>ca. 250 years ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>DgRg 5</td>
<td>Isolated Uniface</td>
<td>Height of land along ridge</td>
<td>Alpine</td>
<td>Alpine</td>
</tr>
<tr>
<td>DgRg 6</td>
<td>Historic refuse/CMT*</td>
<td>Near a small lake</td>
<td>Subalpine Parkland</td>
<td>Alpine (near treeline)</td>
</tr>
<tr>
<td>DgRg 7</td>
<td>Projectile Point</td>
<td>Near a small lake</td>
<td>Subalpine</td>
<td>Alpine (near treeline)</td>
</tr>
<tr>
<td>DgRg 8</td>
<td>Berry trench/lithics/historic</td>
<td>Ridgeline</td>
<td>Subalpine Parkland</td>
<td></td>
</tr>
<tr>
<td>DgRg 9</td>
<td>Berry trench/CMTs</td>
<td>Saddle between ridgelines</td>
<td>Subalpine</td>
<td>Subalpine Parkland</td>
</tr>
<tr>
<td>DgRg 10</td>
<td>Quarry</td>
<td>Alpine ridge</td>
<td>Alpine</td>
<td></td>
</tr>
<tr>
<td>DgRg 11</td>
<td>Lithics/historic</td>
<td>Near a small lake</td>
<td>Subalpine Parkland</td>
<td>Alpine (near treeline)</td>
</tr>
<tr>
<td>DgRg 12</td>
<td>Isolated flake</td>
<td>Ridgeline</td>
<td>Subalpine Parkland</td>
<td>Alpine (near treeline)</td>
</tr>
</tbody>
</table>

* = culturally modified tree

Ridgelines or crests appear to be the most common areas to find sites as they number 71% of the aboriginal site types identified, whereas association with the small cirque lakes comprise the other 29%. These findings concur with Mierendorf’s (1999:8) observations in which 51.4% of his 37 identified highland sites are located on ridge crests and 8.1% are associated with lakes. Ease of travel and available sight lines appear to be bigger draws at these sites than the availability of water. As is mentioned in the methodology chapter of this thesis (Chapter 5.1; Figure 11), ridgelines were definitely the easiest places on which to move during the survey; a fact which does not appear to have been lost on the aboriginal inhabitants of this area. There may also have been deliberate attempts to leave signs of use on prominent ridges and heights of land where others were later likely to frequent in order to exercise “co-rights” to the area as suggested earlier (Mierendorf 1999).

The fact that water does not appear to be as much a draw to people using mountainous regions as is commonly found in other areas indicates that the aboriginal users of these areas were likely highly mobile and confident of their surroundings. I can appreciate this confidence having worked in the area and planned my survey days with destinations in mind where availability of water could significantly reduce our load. This might suggest that aboriginal people had specific resources in mind when entering mountainous areas instead of huddling around life-sustaining water and waiting for chance encounters with resources. Because the working seasons in such areas were short, resources would need to be extracted with some haste.

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The treeline transitional zone also appears to be an area which attracted people. Only two sites (25%) were found in areas which were likely true alpine at the time of their creation, whereas the other six (75%) were probably situated in subalpine parkland or in the alpine near treeline (the treeline transitional zone). These results concur with Mierendorf’s (1999) findings, however, his focus remains on the distinction of two rather than three categories of vegetation zones. By concentrating on only the subalpine and alpine zones, he does not indicate whether these contexts were expected to have been the same at the time of the site’s creation. He does find, however, that 89% of his sites fall within the subalpine, while only 11% are located in the true alpine. I would argue that many of these subalpine sites likely also fall within the treeline transitional zone. Such areas would have offered ease of travel, good sight lines, as well as shelter, fuel, and food. Determining exactly where these zones would have occurred for the time period we seek should result in the discovery of the highest concentration of sites.

In conclusion I would suggest that the sites identified in this research represent two very separate time periods. The early historic period, as is indicated by the presence of berry trench processing sites (Sites DgRg 8 and DgRg 9; Chapters 6.4 and 6.5), and a separate, earlier period represented by the sites which held lithic materials. During both time periods, however, a similar ecotone was probably sought - the treeline transitional zone. All sites also appear to be connected by trails associated with prominent ridgelines, not necessarily close to water. People appear to have been familiar enough with their environment to venture away from water in order to collect or hunt the resources they sought in order to take advantage of a relatively short window in which to exercise their tasks.
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Notes:

1 Pre-contact refers to the period of time before direct contact with Europeans. It includes the "protohistoric" period at which time European goods did begin to influence First Nations lifestyles via trade but was not associated with any sustained physical contact with Europeans. It represents the unrecorded (i.e., not appearing in written histories) period of time in which First Nations lived and used the land.

2 The implementation of the Forest Practices Code Act (1994) in British Columbia and its section regarding the recognition of archaeological resources has greatly increased the amount of survey in upland areas at least on a piece meal basis. Unfortunately many predictive models used by forest districts to rate which areas must be looked at fail to rate many upland areas with much archaeological potential due mainly to the fact that the survey data used to develop the models is lacking in these areas.

3 In the Chilliwack District as of 1997 the only higher elevation zone which had some intensive archeological research conducted in it was the ESSF zone falling entirely in the subalpine (Franck et al. 1997).

4 Other Northwest Coast researchers have begun to concentrate, at least partially, on higher elevation biogeoclimatic zones in the Chilliwack District over the last couple of years. This includes D. Lepofsky's work on aboriginal burning (ongoing) and N. Oakes full coverage survey work at Harrison Hill (ongoing). R. Reimer (SFU) has also contributed recently to the subalpine and alpine archaeological data base; however, this falls within the Squamish Forest District.

5 Further alpine survey has taken place in the Squamish/Garabaldi area; however, as this information is part of a land claims initiative it is not available at this time.

6 Isolated finds in the United States are generally not recorded as sites whereas in Canada a single artifact is usually given the same designation as any other site.

7 This is the only such artifact known of in the immediate area and does suggest at least semi-sedentary use. An informant of Duff (1952:61) said that such bowls were used to mix poison as well as pigments.

8 Sumas Lake was drained in 1924. See Thom and Cameron (1997) for a discussion of the impact of the draining of Sumas Lake to the Stó:lō.

9 The Cascade Mountains actually extend in a finger approximately 110 km further north near Lytton, B.C. They are separated from the Coast Mountains to the west by the Fraser River.

10 The proposed construction of the "High Ross" dam would have created a much larger and deeper Ross Lake; however, this decision was staid mainly through opposition by Canadian environmental interests groups and the Federal and Provincial Governments which later signed a treaty to stop the dam in 1984 (see Perry 1981; Federal Energy Regulatory Commission 1995).

11 A series of cirques stepped up a mountain are sometimes called cyclopian steps such as which a cyclops might ascend (Rick Alexander pers. comm. 1998).

12 Late glacial period termed the "Little Ice-Age" (as termed in Denton and Porter 1967; Leonard 1974).

13 The warm, moist Mesothermic Period lasted for approximately 300 years longer in the Cascades than it did on the Coast which had already reached near modern conditions by around 7000 BP (Pellatt 1996).