2.0 ENVIRONMENT, CULTURE, AND ARCHEOLOGICAL RESEARCH IN THE NORTHERN CASCADES

2.1 Project Environment

Although environmental data for the project area are sparse, it is possible to summarize several of the primary characteristics of the watershed. Unlike lowland areas of the Pacific Northwest, little is known about contemporary climate, vegetation communities, and faunal populations in the mountainous interior of the northern Cascades. Even less is known about the paleoecological history, including the biogeography of plants and animals, role of fire and other disturbance processes, and the anthropogenic effects that the indigenous Northwest populations had on the landscape and its biota. In order to fully understand the human history here, it is necessary to know how human use of this landscape is influenced by mountain physiography, resource abundance and availability, climate, and human demography. This section details current knowledge regarding these influencing variables.

From the crest of the Pickett Range, Little Beaver Creek flows east for ca. 28 km (18 miles) before it joins the upper Skagit River (Figure 2). The watershed of Little Beaver covers an area of 166 km^2 (64 square miles) and constitutes one of the many remote, rugged, and untracked mountain valleys characteristic of the northern Cascade and Coast Ranges of Washington and British Columbia. The watershed is bordered by glaciated peaks and interconnecting alpine ridges that separate it from the watersheds of the upper Chilliwack River to the west, the Baker River to the southwest, Silver Creek to the north, and Big Beaver and Arctic Creeks to the south. Highest summits on the watershed divides are Mount Challenger at 2,523 m elevation (8,277 ft), Whatcom Pk. at 2,309 m (7,574 ft), Mox Peaks 2,593 m (8,504 ft), and Mount Spickard at 2,738 m (8,979 ft), with many other summits exceeding 2,000 m in elevation (Figure 3). There are presently 61 alpine glaciers in the watershed. Challenger Glacier, covering an area of ca. 3.4 km^2 (840 acres), is the largest and most prominent of these. It dominates the topography and scenery of the upper valley and the Whatcom Pass vicinity.

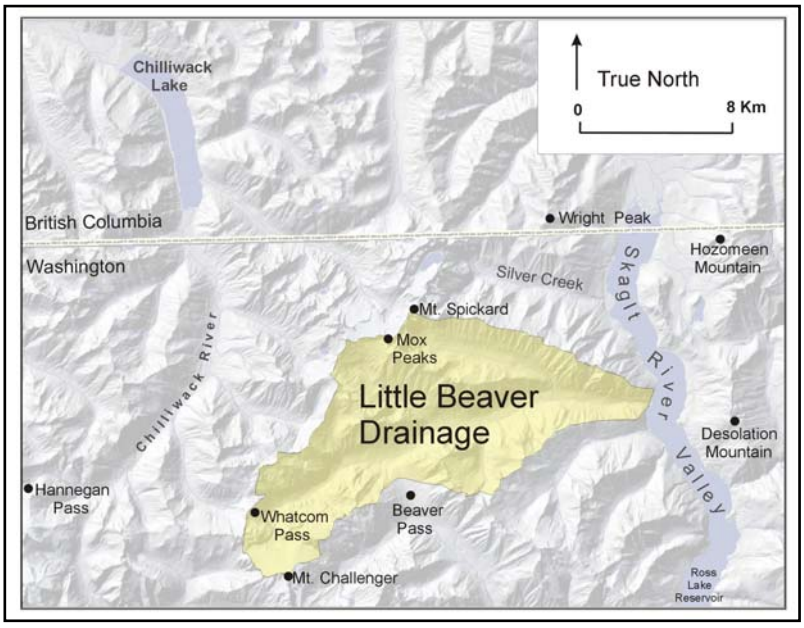

Figure 2. Map of Little Beaver watershed and vicinity and key geographic locations mentioned in the text.

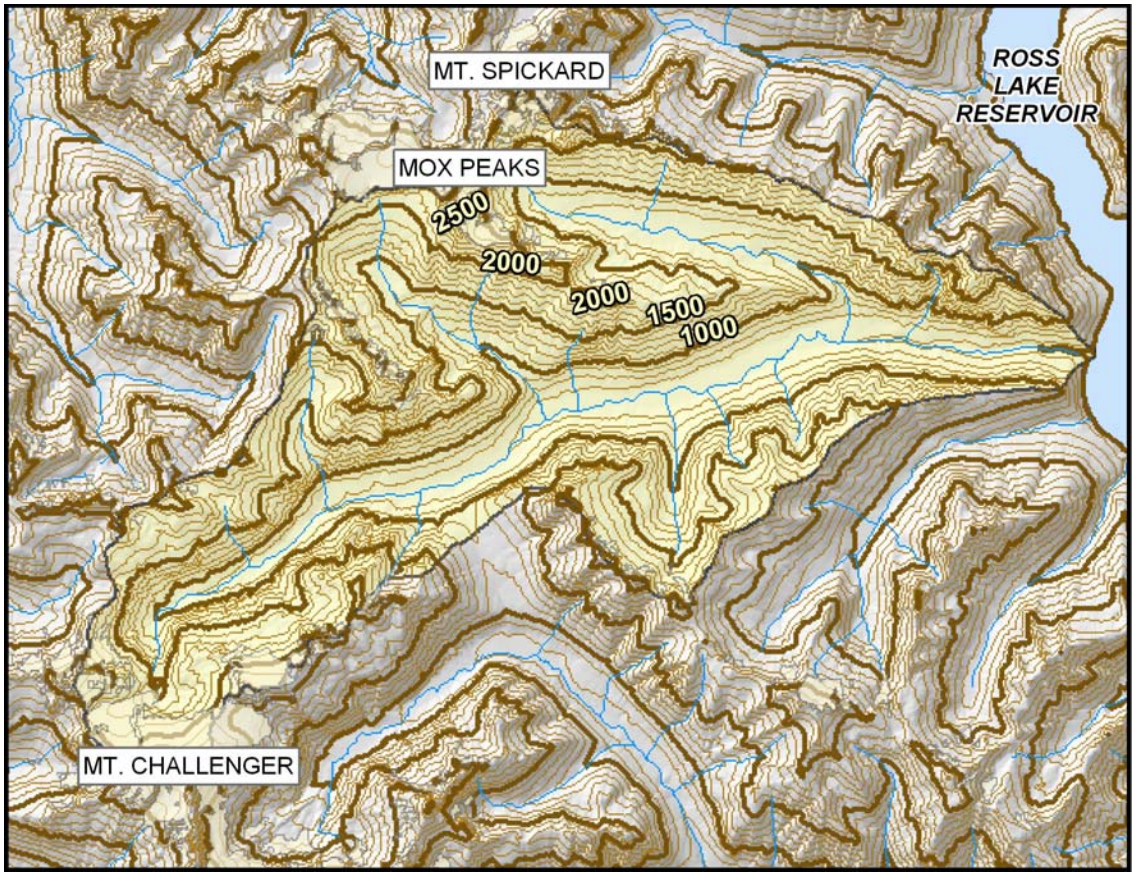

Figure 3. Topographic map of Little Beaver watershed vicinity; bolded index contour interval is 500 m; elevation of the index contour outlining Ross Lake is 500 m above mean sea level.

The only historic climate records of the watershed are from Beaver Pass, located along the southern watershed boundary at 1,890 m (3,600 ft). Annual precipitation at the mouth of Little Beaver Creek is ca. 0.8 m (30 in) and snowfall at Whatcom Pass is ca. 4.3 m (14 ft). At Hozomeen, near the international boundary, mean annual precipitation is 79 cm (31 in) (International Joint Commission 1971). Climate data from nearby recording stations in the Skagit Valley are shown in Table 1.

Table 1. Skagit River Climate Data[1]

Climate Station	Av. Max. T (^{o} F)	Av. Min. T (^{o} F)	Av. Total Precip.	Av. Total Snowfall
Skagit Power Plant 1931-1958	59.4	41.0	196 cm (77.14 in)	145. 3 cm (57.2 in)
Newhalem 1959-2003	57.5	41.5	203.1 cm (79.95 in)	94.7 cm (37.3 in)
Diablo Dam 1931-2003	57.4	39.7	191.0 cm (75.2 in)	141.5 cm (55.7 in)
Ross Dam 1960-2003	56.5	40.5	145. 3 cm (57.2 in)	121.7 (47.9 in)

[1]Data from Western Regional Climate Center (www.wrcc.dri.edu)

The eastern portion of the watershed is heavily forested on the valley bottom and along the valley walls. To the west the forest canopy becomes increasingly patchy, until the upper valley, where isolated tree islands are outlined by brushy avalanche communities, snow-maintained meadows, and rock walls, buttresses, and talus (Figure 4). Western hemlock *(Tsuga heteropylla)*, Douglas-fir *(Pseudotsuga menziesii)* and Western red-cedar *(Thuja plicata)* are most prevalent in the eastern portion of the watershed, and give way to a mostly late-successional mountain hemlock forest *(Tsuga mertensiana)* with co-subdominance of Alaska yellow-cedar *(Chamaecyparis nootkatensis)* and Pacific silver-fir *(Abies amabilis)* at sites like Beaver Pass. Much of the forest exhibits complex structure, with multi-storied layers of live, dead and dying trees, as well as many fallen trees. Some fallen trees are quite large, and all classes of decay are present. Along the valley bottom are several diverse vegetation communities within a riparian zone bordering the creek and shrubby communities growing on boulder fields associated with talus deposits, alluvial fans, glacial moraines, and rock slide deposits. This summary description draws on information in two environmental assessments published by the park, one for the Beaver Pass SNOTEL and the other for the Stillwell Camp trail reroute (National Park Service 2000 and 2001). It also draws on the park-wide vegetation map published in Agee and Pickford (1985).

Elevationally wide, subalpine parkland covers much of the western segment of the watershed and its higher elevations. This zone forms a heterogeneous patchwork of vegetation communities dominated by conifer trees, shrubs, herbs, and lichens. The alpine zone is relatively sparsely populated by plants, which have adapted to the extreme growing conditions among mostly permanent snow pack, bare bedrock, talus, glacial moraines, and glacial ice.

Dominant subalpine conifers include mountain hemlock *(Tsuga mertensiana)*, Pacific silver-fir *(Abies amabilis)*, and Alaska yellow-cedar *(Chamaecyparis nootkatensis)*. Subdominant species include White-bark pine (*Pinus albicaulis*) and subalpine fir *(Abies lasiocarpa).* Like the montane forest below it, subalpine communities reflect an east-west gradient in elevation, precipitation, and other climate variables. Due to its greater habitat diversity, the subalpine exhibits a wide diversity in plant communities. Many subalpine meadows are dominated by the heather-huckleberry community, and other openings by lush herbaceous, dwarf sedge, and rawmark and low herbaceous communities of Franklin and

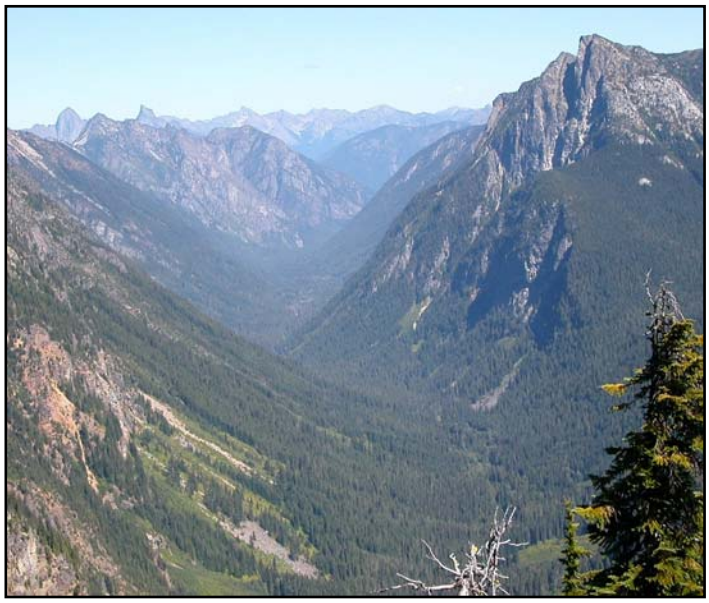

Figure 4. Little Beaver Cr. Valley, facing east, Hozomeen Peaks on the horizon at far left.

Dyrness (1988). Plants from these community types, observed within the boundaries of archeological sites recorded in the project area, include black alpine sedge *(Carex nigricans)*, partridgefoot *(Luetkea pectinata),* white-flowered rhododendron *(Rhododendron albiflorum)*, mountain ash *(Sorbus sitchensis)*, boxwood *(Pachistima myrsinites)*, yarrow *(Achillea millefolium)*, parsley fern *(Cryptogramma crispa)*, Alaska saxifrage *(Saxifraga ferruginea)*, deerbrush *(Ceanothus velutinus)*, huckleberry *(Vaccinium membranaceum)*, subalpine spirea *(Spirea densiflora)*, serviceberry *(Amelanchier alnifolia)*, Sitka willow *(Salix sitchensis)*, wild strawberry *(Fragaria virginiana)*, kinnikinnick *(Arctostaphylos Columbiana)*, and mosses, lichens, and grasses. Throughout the project area subalpine, most often in heather-huckleberry communities, small trees, particularly Alaska yellow-cedar, are noticeably invading meadows and other openings. The only nearby study of modern meadow invasion by trees is reported from Chittenden Meadow, located on the Skagit Valley floodplain 11.5 km to the north (Lepofsky et al. 2000).

As indicated by historic records from the adjacent Skagit River valley, the Little Beaver watershed is likely to have been populated by a rich fauna that included black bear *(Ursus americanus),* grizzly bear *(U. arctos)*, black-tailed deer *(Odocoileus hemionus columbianus),*mule deer *(O. hemionus)*, mountain goat *(Oreamnos americanus)*, elk *(Cervus Canadensis)*, and cougar *(Felis concolor)*. Smaller mammals included beaver *(Castor Canadensis)*, marmot *(Marmota caligata)*, snowshoe hare *(Lepus americanus)*, bobcat *(Lynx rufus)*, lynx *(Lynx Canadensis)*, ermine *(Mustela eminea)*, river otter *(Lutra Canadensis)*, marten *(Martes americana)*, mink *(Mustela vison)*, red squirrel *(Tamiasciurus hudsonicus)* and Douglas squirrel *(Tamiasciurus doglasii)*. Over 170 bird species have been recorded in the valley (International Joint Commission 1971; Taber 1971).

Two broad groups of rocks comprise most of the watershed's bedrock. These are the granitic rocks of the Chilliwack Composite Batholith and the oceanic rocks of the Hozomeen terrane. Rocks of the Skagit Volcanics, a third type, are restricted to the northeastern extremity of the watershed. Exploratory archeological surveys of the Skagit Volcanic rocks immediately north of Little Beaver's watershed found no exposures of glassy rocks or evidence of their use (Mierendorf 1997). Figure 5 shows the approximate boundaries of the main rock groups in the project vicinity, as redrawn from the geologic map published in Tabor and Haugerud (1999). To the west, and outside of Little Beaver's watershed, rocks of the Hannegan volcanics include at least several dikes of glassy rocks, one of which was quarried and utilized as a source of tool stone for five millennia (Mierendorf 1999).

2.2 Environmental History

The environmental history and paleoecology of the watershed, as with most other mountain valleys in the northern Cascades, remains virtually unexamined. Nevertheless, data gathered from several local and regional investigations reveal the broad outlines of this history. Prior to ca. 12,000 years ago, the project area was mostly covered by the Cordilleran Ice Sheet, which advanced in several phases. At its maximum advance during the Vashon stade, ca. 14,500 years ago, only the highest peaks and ridges protruded above the glacier surface. By 12,000 years ago the glacier terminus had retreated north of the 49th parallel, and was followed by the brief re-advance of the Sumas stade, ca. 11,500 years ago. The long history

and great extent of glacial erosion of the Little Beaver watershed is today expressed by the steepness of the local topography, the U-shaped cross-valley profile, the presence of non-local rock types derived from northern sources, and glacially smoothed and striated bedrock surfaces found at an elevation of at least 2,088 m. After the cordilleran glacier retreated, the highest peaks continued to support local alpine glaciers, as they do today.

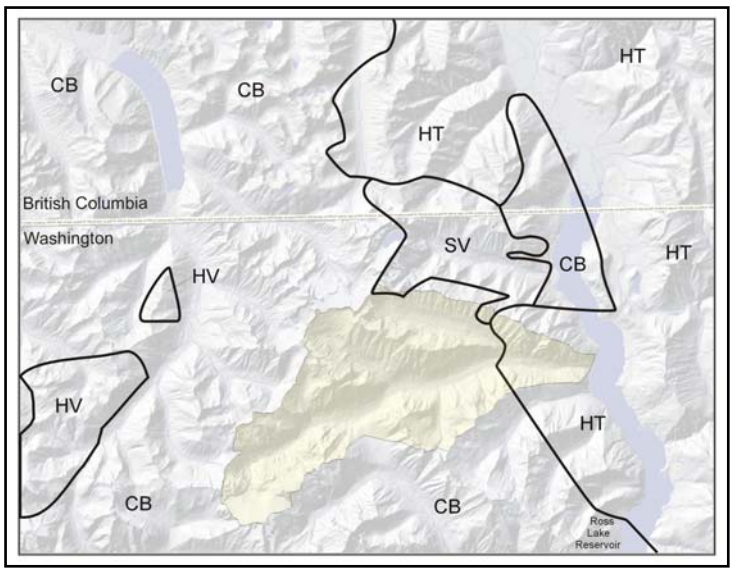

Figure 5. Geologic map of the project area; map unit boundaries approximate; HT, rocks of the Hozomeen terrain; CB, granitic rocks of the Chilliwack composite batholith; SV, Skagit volcanic rocks; and HV, Hannegan volcanic rocks are yellow.

Rapid regional warming of the climate marked the end of the Pleistocene and the beginning of the Holocene in lowland and coastal areas of the Pacific Northwest. This warmer period lasted until ca. 8,000 years ago, at which time the climate became cooler. During this warm period, Doug-fir and red alder became dominant tree species and fires occurred frequently. Following a shift to cooler conditions, the climate and vegetation became more like today, with the establishment of western hemlock and red-cedar forests. In the interior and montane portions of the Pacific Northwest, this shift to cooler and moister conditions was delayed until about 4,500 years ago or later. But the paleoclimate record of the lowlands may be of limited use for understanding the paleoecological history of interior Cascade valleys like the Little Beaver, which are transitional between coastal and interior environments.

After ca. 4,500 years ago, the spread of late-successional forests of hemlock and cedar contributed to increasing closure of forest canopies, compared with before; after ca. 2,500 years ago, similar forest types spread to western subranges of the Rocky Mountains of eastern Washington, northern Idaho, and southern British Columbia. The cooler and moister climate regime of the last 4,500 years also coincides with cycles in the advance and retreat of local alpine glaciers. The largest of these advances in the North Cascades is also the most recent; this "Little Ice Age" was a global event that occurred between ca. A.D. 1300 and A.D. 1850. In the last 150 years, alpine glaciers have generally retreated, in some cases dramatically.

Current understanding of the Holocene environmental history of the project area benefits from a recent paleoecological study in the Thunder Creek watershed, located ca. 40 km southeast. Here, Prichard (2003) examined forest and fire vegetation dynamics along several steep altitudinal gradients on a valley wall and the Holocene fire and vegetation history as inferred from preserved charcoal, macrofossils, and pollen in a mid-elevation lake (Panther

Potholes is at 1,100 m elevation) sediment core. Thunder Creek is a major tributary of the Skagit River and is comparable in its salient environmental characteristics with the Little Beaver watershed.

Prichard's study of forest dynamics revealed a surprisingly high diversity of conifer species (12) and that the "combination of steep environmental gradients, slow rates of forest succession, frequent fire, and other disturbances maintain a diversity of species assemblages and structures." (Prichard 2003). She found that low-elevation forests have similar composition and dynamics to lowland forests of the maritime Pacific Northwest. High elevation forests (>1,200 m), in contrast, are much more diverse and cannot be characterized by a single forest assemblage. The Holocene vegetation history inferred from the lake sediment core corresponds with the regional climate and vegetation pattern. No major changes in fire frequency were found over the ca. 10,000 year record of lake sediment charcoal. In summarizing the results of her own and other paleoecological studies in mountains, Prichard notes that climate variation measured at millennial time scales drives regional vegetation changes, while fire and other disturbances drive vegetation change at decadal to century scales. Also, unlike the case at low elevations, the response of high elevation forests to climate change is very site dependent. This means that in high elevation areas, "The type and timing of vegetation changes may not have been analogous to lowland sites due to differences in elevation, heterogeneous terrain, and more extreme growing conditions." (Prichard 2003:44).

2.3 Research Into Indigenous Use of the High Elevation, Northern Cascades Interior

The marine-influenced mountains of the Pacific Northwest cover vast tracts of the Northwest Coast and Plateau culture areas, but most authorities consider the mountains unimportant for understanding the pre-contact history of indigenous populations. Historically, the rugged and interior mountain areas attracted little serious anthropological and archaeological interest. There are several reasons for this, not the least of which is the difficulty of access, often necessitating travel across permanent snow pack, glaciers, avalanche paths, and steep topography, requiring skills not usually required of professional archeologists. Furthermore, there is no evidence to suggest that the high country supported other than very low population densities compared with the higher densities of lowland Coast and Plateau groups. Also contrasting with the lowlands, indigenous groups generally used the high country between spring and fall rather than year-around. Contributing further to the historical view is the loss of most traditional oral literature and traditional practices relating to use of the high country that followed the population decimation after the introduction of European diseases in the contact period. As a result, traditional subsistence activities and regular travel expeditions to the mountains ceased and mountain-oriented bands became displaced by early settlement and mining activities. Finally, a pervasive methodological limitation of archeological investigations also contributes to the lack of professional interest. This constraint, caused by the obscuring effects of extremely dense vegetation, limits the visibility of archeological remains. For decades, these factors combined to support the view among archeologists that few if any archeological remains would ever be found in the mountainous interior, which in turn reinforced entrenched beliefs that high elevation research would likely be unproductive. The cumulative effect of all of these factors has been the tacit denial that

indigenous people had any real presence in the mountainous interior of the Northwest Coast culture area, this in spite of the fact that such landscapes cover the majority of the land area in northern Washington and British Columbia.

This view is now being challenged by new evidence. The last two decades have seen an increased level of interest and archeological inventory activity in the Pacific Northwest high country. Surveys in widespread high elevation landscapes of the Northwest Coast have revealed the presence of numerous pre-contact period archeological resources. The empirical data acquired in these surveys forms the basis for a revisionist consideration of pre-contact indigenous use of, and adaptation to, the high mountains. It may have been the case that some bands developed strategies especially adapted to the mountainous interior.

Although relatively few systematic surveys have been conducted in high elevation lands of the northern Cascades, results so far reveal that archeological remains are widely distributed. In the northern Cascades of Washington and British Columbia, subalpine and alpine archeological sites of pre-contact age have been recorded in watersheds adjacent to the project area. In North Cascades National Park, such sites are reported in the upper Skagit River watershed (Mierendorf 1997 and 1999) and in the Chilliwack River (a tributary to the Fraser River) watershed (Mierendorf 1987 and 1999). On the British Columbia side of the international boundary, high elevation sites are described in the Skagit River watershed of Manning and Skagit Valley Provincial Parks (Franck 2000 and 2003), and from the Chilliwack River watershed (Schaepe 1998 and 1999). High elevation archeological resources are also reported in the eastern North Cascades, in the Similkameen River watershed in Cathedral Provincial Park of British Columbia (Vivian 1989; Reimer 2000), and in the Methow River (Fulkerson 1988) and Stehekin-Chelan River watersheds of the Okanogan National Forest and the North Cascades park complex (Mierendorf 1986 and 1999).

Controlled excavations of high elevation archeological sites in the northern Cascades are even more infrequent than surveys. Test excavations have been conducted in only three localities in the northern Cascades subalpine anywhere near to the project area. In chronological order, these are in the upper Nooksack River watershed (McClure and Markos 1987), in the upper Chilliwack River watershed of North Cascades National Park (Mierendorf 1999), and in the upper Skagit River watershed of Manning Provincial Park (Franck 2003).

In contrast with the high elevations, more extensive archeological research has been conducted in bottom lands of the adjacent upper Skagit River valley, both around the shoreline of, and on the bottom of Ross Lake reservoir. The earliest surveys to inventory sites were conducted in the mid- to late-1970s by two separate university-based archeological contractors (Rice n.d.; Grabert and Pint 1978). Neither of these surveys recorded archeological remains at the mouth of Little Beaver Creek, although only Grabert and Pint (1978) specifically identify this area as one of their survey tracts. In 1984 site 45WH220 was the first recorded in the Little Beaver watershed during a reconnaissance survey conducted by archeologists also working under contract with the NPS (Mierendorf 1986).

Beginning in the late 1980s, an intensive site survey and evaluation program within the reservoir drawdown zone (the reservoir bottom exposed during each spring's lowered pool level) was conducted as part of the studies preceding the City of Seattle's application for a relicense to continue operation of its Skagit Hydroelectric Project. By the early 1990s, 144 pre-contact age archeological sites were recorded and nearly 40 of these were test excavated in order to assess their scientific and cultural significance (Mierendorf et. al. 1998).

In a separate investigation funded by SEEC, radiocarbon age estimates of a large quarry (45WH224), located not far from Little Beaver valley, revealed indigenous use of this portion of the Skagit River extending to at least 7,600 radiocarbon years (8,400 calibrated years). Test excavations conducted over several seasons (1987-1989) documented, for the first time in the Northwest Coast, the intensive quarrying, collection, and processing of local chert outcrops and deposits for the manufacture of stone tools (Mierendorf 1993). Largely due to inherent characteristics of the tool stone in massive outcrops, the quarrying and primary reduction activities left quarry assemblages dominated by poor tool-stone quality shatter and broken flakes. The much higher quality "quarry blanks" were transported to other sites in the Skagit Valley for later stages of tool fabrication (Mierendorf et. al. 1998). The information generated by these studies constitutes the most extensive archeological data available for an interior valley of the northern Cascade Range. As will be seen in the discussion of results, these data provide important comparative information necessary for understanding indigenous use of the Little Beaver watershed.

Currently, the City of Seattle, in partnership with NPS, is implementing the relicense phase of the Ross Lake archeological project, which requires the mitigation of reservoir effects to those sites determined eligible to the National Register of Historic Places. Now, 16 such sites are listed as contributing historic properties to the Upper Skagit River Valley Archeological District. Treatment and mitigation of these historic properties will be on-going for several years.

Within the project area proper, all previous archeological field investigations have consisted of either low intensity reconnaissance surveys, or intensive inventory level surveys conducted on small land tracts as part of environmental reviews required to assess the potential effects of park undertakings. Such undertakings consist of trail reroutes and bridge construction. One limited site assessment, consisting of the excavation of two archeological test units, resulted in the "hardening" of the floor of a historic shelter in order to protect a buried archeological component. The data recorded from these activities is maintained in park files and has not been published previously. The inclusion of this information later in this report constitutes the first synthesis of the current body of archeological data gathered for the Little Beaver watershed.

2.4 Pre-contact History of the Project Area

The following summary of the pre-contact history draws largely from the results of the Ross Lake archeological project (Mierendorf et. al. 1998) and related studies in the upper Skagit River Valley. The archeological survey phase covered 47 km^2 and recorded 150 sites, 36 of which were test excavated and assessed for National Register eligibility. Sixteen of the 36

sites are listed as contributing properties to the Upper Skagit River Valley Archeological District. Based on these studies, four main chronological periods are defined primarily on the basis of radiocarbon dates and to less extent, on diagnostic artifact types. The current sample of all archeological radiocarbon dates from the upper Skagit Valley is 38 and the sample of time-sensitive artifacts is 117. Time period boundaries are approximate. The first period spans 10,000-7,000 years ago; the second 5,500-3,500; the third 2,000-1,000; and the most recent 600-250 years ago.

Initial use of the upper Skagit Valley by indigenous populations began in the early Holocene, following retreat of the Cordilleran Ice Sheet, approximately 10,000 years ago. The earliest cultural levels of Desolation chert quarry (45WH224), dated 8,400 (calibrated) years ago, reveal that the first visitors to the area sought out the abundant tool stone sources, particularly of Hozomeen chert (Mierendorf 1993). The lowest levels of TU 14 at 45WH224 comprise the only excavated component dated to this period. Sites reflecting the second period appear to be more frequent. Based on frequencies of certain morphological types in the sample of 117 projectile points, the most intensive use of the project area was during the second and third periods, which span the middle and late Holocene. However, the largest number of radiocarbon-dated components is from the last two periods, which reflect a continuation of the procurement and use of Hozomeen chert along with a suite of other local and non-local tool stone types. The presence of well-preserved cooking features suggests longer-duration seasonal encampments than in earlier periods. The identification of animal taxa from bone fragments within cooking hearths from the last two periods indicates exploitation of local fauna, including mountain goat *(Oreamnos americanus)*, beaver *(Castor Canadensis)*, Cervidae (deer and elk), and unidentifiable small mammals (Mierendorf et al. 1998: Appendix H). The presence of tools manufactured from non-local sources (such as obsidian derived from sources in today's Oregon) indicate that the inhabitants utilized high quality tool stone procured via interregional exchange networks. The diversity of diagnostic tool forms and non-local tool stone types reveal that indigenous bands or groups from north, west and east of the northern Cascades traveled through the project area, procuring tool stone and gathering some of the many subsistence resources along the way. There is no current evidence to support an assertion for permanent or long-term habitation in any of these time periods, and all residential sites appear to reflect relatively short-term, seasonal occupation.

The closest permanent habitation sites to the project area are in the Chilliwack River valley of British Columbia, northwest of the project area. Through preliminary archeological investigation of a pithouse settlement (DgRk-10), one house dated 4,130 radiocarbon years old (Merchant et. al. 1999). A stemmed projectile point from this site, made of Hozomeen chert, corroborates the age estimate. If dated accurately, this constitutes the earliest known circular pithouse on the Northwest Coast (Merchant et. al. 1999:61). This habitation site is located 12 km upstream of the mouth of the Chilliwack River. Even closer to the project area, house pits have been confirmed at site DgRi-1, located on the moraine at the north end of Chilliwack Lake (Schaepe 1998). Like at DgRk-10, Hozomeen chert was also utilized as tool stone by the site inhabitants. Unlike the upper Skagit River valley, where pithouses have yet to be found, archeological and ethnohistoric evidence indicates that the upper Chilliwack River valley supported pithouse villages for at least four millennia.

The only chronological data that addresses periods of high elevation use are from test excavations at 45WH484, located in the subalpine of the upper Chilliwack River watershed. At this site, a continuous record of hearth use, along with exploitation of local vitrophyre (obsidian) tool stone and other subsistence resources, is documented for the last 4,500 radiocarbon years (Mierendorf 1999). The charcoal used to date the site was excavated from a repeatedly-used campfire/hearth area; the presence of St. Helen's W tephra near the top of the hearth area, bracketed by lithic artifacts, indicates the site was used after A.D. 1480. Currently, this is the only well-dated, excavated subalpine archeological assemblage in the northern Cascades. Although excavation data from this important site are presently unpublished, the assemblage is quantitatively dominated by a very high density of chipped stone debitage resulting from the bipolar reduction of vitrophyre from Copper Ridge geochemical source B (section 4.6 of this report). A much smaller proportion of the site's artifacts consist of tool resharpening flakes dominated by tool stone types from distant (exotic) and unknown sources. Although this site spans the last three of the four time periods identified above, no discernable differences in assemblage characteristics or site content were observed, suggesting little change in site use since the mid-Holocene. Given the long tradition of high elevation use suggested by radiocarbon dates from 45WH484, it is critical that more of the high elevation sites in the northern Cascades be test excavated in order to understand this poorly understood aspect of indigenous Northwest Coast life (Franck 2003).

Archeological remains representing the proto-historic period (i.e., the very end of the late pre-contact period) have not been found in the project area.

2.5 Ethnohistoric Background

In most anthropological literature, generalized maps depicting tribal or indigenous group territories fail to identify the Little Beaver watershed, which is ambiguously located among the hinterland boundaries of several Salish-speaking groups of people, in particular, the Upper Skagit, Nooksack, Stó:lō , and Nlakápamux (Lower Thompson) of northern Washington and southern British Columbia. Yet, scattered throughout anthropological and ethnohistoric documents are numerous local accounts of indigenous traditions of travel, resource use, and inter-group encounters in a broad interior portion of the northern Cascades that includes the project area (cf. Smith 1988). In summarizing the ethnohistoric details of the project area, this section of the report relies on Allan Smith's (1988) compilation of mostly published sources that were available in the mid and late-1980s, the period when Dr. Smith prepared the park's ethnographic overview. Most of Smith's compilation draws from the early works by Duff (1952), M. Smith (1952 and 1956), Hill-Tout (1904), Suttles (1957), Teit (1900), and others cited by Smith. Although his overview constitutes the first anthropological treatment of lands within the project area, certain archival documents unavailable to Dr. Smith, and more recently published documents, are used here to supplement Smith's data. Boxberger (1996) also uses ethnohistoric data, but his study is directed, instead, at assessing the available information regarding contemporary park-associated American Indian groups and the basis for claims of cultural affiliation with park areas. Majors (1984b), Wells (1987), Schaepe (1998), Boxberger and Schaepe (2001), and Franck (2003) provide additional new information.

Culturally, the Little Beaver watershed is within the territory of two historically very different indigenous groups. The first is the Nlakápamux, whose main populations lived to the north, along the Fraser River and the northern extremity of the Cascades in British Columbia. The second group is the Chilliwack, a tribe affiliated with the Stó:lō, the main villages of the latter concentrated along the Fraser River south and west of Nlakápamux territory. Although Smith (1988) characterizes both groups as mountain and high-land oriented tribes, significant cultural differences characterized the Nlakápamux and the Stó:lō. Linguistically and culturally, the Nlakápamux affiliated with people of the interior Canadian Plateau, and ranged widely through the northern Cascades and hunted the salmon-free valley of the upper Skagit River. In contrast, the Stó:lō people linguistically and culturally affiliated with Halkomelem peoples of the lower Fraser River, the Straits, and southeast Vancouver Island. According to Smith (1988), the Chilliwack appear to be unique among Stó:lō peoples for their close ties to the somewhat isolated Chilliwack valley, to the rugged mountains of its headwaters, and extending south into a portion of the upper Nooksack River valley. Unlike the upper Skagit River above the gorge, salmon abounded in the Chilliwack River system and constituted a staple subsistence food of the Chilliwack people. Both groups lived in winter villages consisting of semisubterranean dwellings. Despite the limited data available to Smith, contemporary evidence supports his inferences and assertions regarding indigenous use of the park's high country generally, and the project area, in particular. Subsequently, I have relied on Smith's conclusions to formulate my own ideas suggesting a strong mountain orientation in the adaptation of several groups, such as the Stó:lō and Nlakápamux (Mierendorf 1999).

In addition to the data compiled by Smith (1988), Wells' (1987:217) map plots indigenous trails along the Chilliwack River valley, connecting to the upper Nooksack River and the Skagit River via the Little Beaver. It also shows the upper Chilliwack River watershed (inside the park) was hunted for grizzly bear and beaver and fished for salmon. Majors (1984b), Boxberger (1996), Boxberger and Schaepe (2001) published copies of maps secured through the work of the U.S. Boundary Commission and others. These maps reveal the wide geographic area covered by traditional Stó:lo knowledge, particularly in the project area and it's vicinity.

The surveyor Henry Custer is the only ethnohistoric source (see Majors 1984b) providing a direct reference to an indigenous structure near to the project area in 1859. Custer's travel party observed a hut made of cedar in the Chilliwack valley a short distance west of the Little Beaver-Chilliwack divide (see 2.6 below). Schaepe (1998:6) provides archeological and ethnohistoric details regarding the pithouse village at the northern end of Chilliwack Lake, in addition to archeological excavation data confirming their function and integrity.

Among all ethnohistoric documents, Teit (1900:241) is unique for providing the only reference to indigenous knowledge of tool stone geography near to the project area: "The Lower Thompsons found stone for their arrow-heads near the head waters of Skagit River. Many were made out of large chipped heads, which are found in great numbers near the head waters of Skagit River." Based on the compatibility of this statement with independent linguistic and archeological data, Mierendorf (1993) infers a direct linkage to Hozomeen chert, one of several abundant tool stone types naturally-occurring in the upper Skagit River

valley, and including the project area. Interestingly, no other ethnohistoric reference alludes to or anticipates the extent of indigenous knowledge and exploitation of tool stone found in and adjacent to the Little Beaver watershed.

The ethnohistoric data leave little doubt that the Stó:lo and Nlakápamux (and several other indigenous groups, such as the Nooksack and Upper Skagit) maintained historical linkages to places like the Little Beaver watershed. For their part, archeological remains can, in a sense, preserve some of the lost history of such places, and where historic documentation is weak, and knowledge of traditional practices are nearly forgotten, such remains reveal aspects about past cultures that developed from a long familiarity and involvement with the mountainous interior of the Northwest Coast.

2.6 Post-contact History

Like many other interior, glaciated watersheds of the northern Cascades, historic records and documents reveal little about early post-contact history of the Little Beaver. The valley may have been visited by trappers deployed from Hudson's Bay Co. forts in the early 19th Century. Only a few exploratory expeditions entered the watershed in the 19th Century, and none of these mentioned evidence of prior human use or habitation. Although only one early contact-period description of the Little Beaver watershed exists, it is revealing. The description ranks among the earliest natural history narratives of the Cascade Range of Washington due principally to the energetic efforts of Henry Custer (Heinrich Küster, of Swiss citizenship), an employee of the U.S. Boundary Commission. It was Custer's task to survey portions of the 49th parallel between today's British Columbia and Washington State. Of all early non-Native narratives detailing exploration of the northern Cascades high country, Custer's is unique in that it was derived from an extended period of time spent in subalpine and alpine terrain, rather than just a day or two (Majors 1984a). This contrasts with Alexander Ross' crossing of Cascade Pass in 1814; William Tolmie's exploration northwest of Mount Rainier in 1833; George McClellan's approach to Snoqualmie Pass in 1853; Edmond Coleman's ascent of Mount Baker in 1868; and Henry Pierce's crossing of Cascade Pass in 1882 (Majors 1984a).

Of particular relevance to the project area is Custer's 1859 trip up the Chilliwack River, over Whatcom Pass, and down the length of Little Beaver Creek to its junction with the Skagit River, with a party consisting of two other non-Indians and nine Indian porters and guides. Custer acknowledged the role of his indigenous employees in insuring the success of his surveys. He also expressed appreciation for the accuracy of the map drawn for him by Thiusoloc (reproduced in Majors 1984b, Boxberger 1996:41, Schaepe and Boxberger 2001:125, and Franck 2003:15), one of his Stó:lō guides in 1859. This map (not reproduced here, see reproduction in references cited) depicts and names the main watersheds and geographic features of a portion of the northwestern Cascades. On this map, the Little Beaver Creek reads "Sko-mel-poa-nook" and Whatcom Pass is depicted as a series of parallel hatch marks, with a straight line connecting the Little Beaver with the upper Chilliwack River. Using Thiusoloc's map information combined with the maps and notes of Custer and other surveyors (including John G. Parke U.S. Engineers, Chief Astr: and Surveyor, G. Clinton Gardner, Assist. Astr: and Surveyor, and Jos.S. Harris, Chas. T.

Gardner, George Gibbs, Francis Hudson and R.V. Peabody), the U. S. Boundary Commission in 1866 published a detailed map, a portion of which is shown in Figure 6. On this map, Little Beaver is labeled "Sko-mel-pua-nook Cr."; Mt. Challenger is "Mt. Wil-a-kin-a-haist". Whatcom Pass is located under the elevation label "5107" and the Chilliwack River is "Klah-heh Cr.". Unlike Thiusoloc's map, no line is drawn through the pass, connecting the Little Beaver and Chilliwack watersheds, and no trail is shown through the Little Beaver watershed.

Custer's notes, sketches and maps are drawn on for the following account of his August 1859 excursion south, up the Chilliwack and then east, over the high divide that separates it from the Little Beaver, as edited and annotated in Majors (1984b).

In only one place did Custer and his party encounter evidence of prior indigenous activity along their route. On the afternoon of August 9, Custer's party established an overnight camp on the Chilliwack River about 0.8 km above the mouth of today's Brush Creek, and ca. six km west of Whatcom Pass. Their camp was "near an Indian hut, made of the bark of the Cedar". Although Custer provides no additional information about this structure, its presence speaks clearly to an indigenous presence in the upper Chilliwack in the early historic period. This "hut" was likely an expediently-built, overnight shelter used by a small group traveling through the valley.

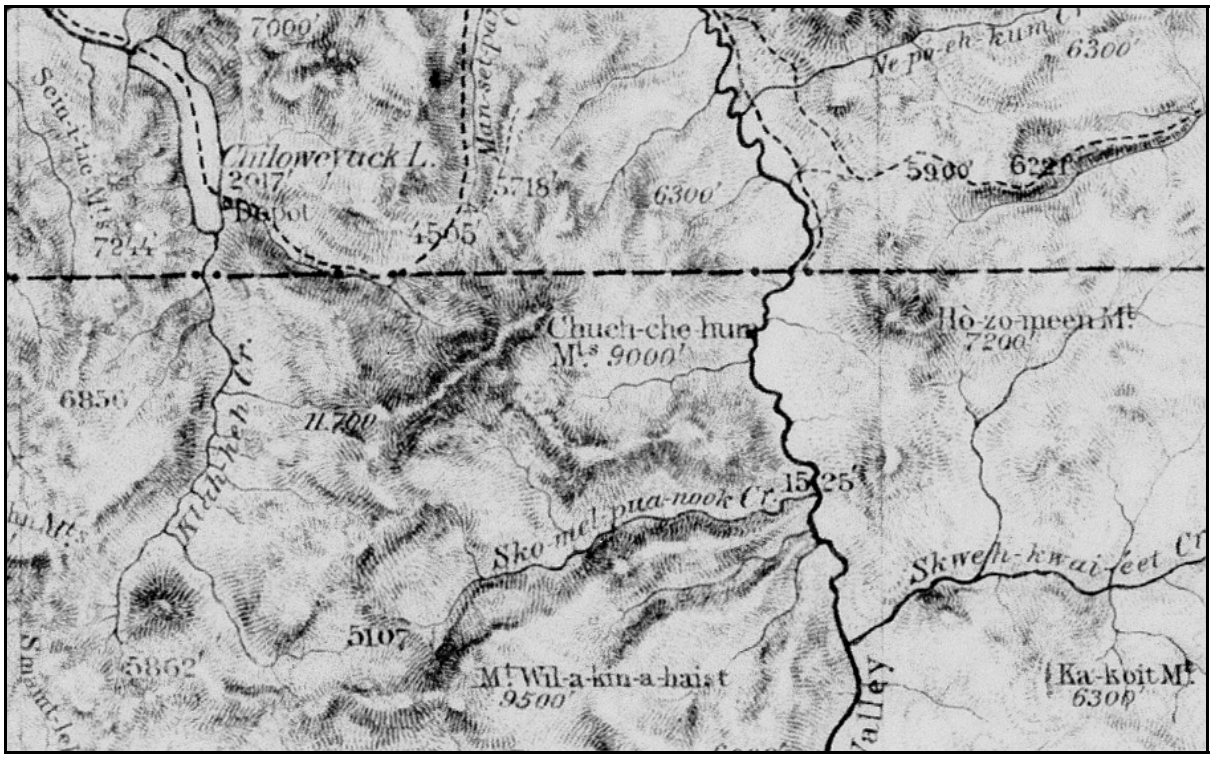

Figure 6. Portion of U. S. Boundary Commission Map, 1866, showing the project area and near vicinity.

Subsequent entries in Custer's notes do not directly relate to indigenous history, but they offer insights into the natural history of the Little Beaver watershed. More than this, the

account serves as a rough yardstick for the travel capabilities and perceptions of the landscape revealed by Custer's energetic travel party. In certain details, his party must have mirrored the experiences of travel parties that for millennia penetrated the mountainous Cascade interior. Most travel today through the project area is on maintained trails, and it is only the rare intrepid hiker who ascends and descends slopes in the manner described by Custer. Lacking the luxury of today's maintained trails, Custer and his party sought the paths of least resistance. In many cases, this required that they walk on the gravel bars of stream channels, involving frequent re-crossings of the stream to avoid obstructions, particularly log jams and dense brush dominated by vine maple (*Acer circinatum*). On several occasions the party ascended and descended the fall line of steep valley walls between the valley bottoms and ridgelines. One such descent was from Whatcom Pass to Little Beaver Creek (976 m elevation loss) on August 11, which Custer described as:

> "..the steepest and most dangerous I ever have made. Had it not been, for the bushes and small trees, which gave us an occasional point of appuy [apply=support], we would have found it impracticable. As it was, it could only be overcome, by the utmost caution on our part, by using our hands, arms, legs, and sti[c]ks, freely in a multitude of novel positions. Once to have lost foothold here, nothing would have been left to the unlucky climber, but to resign himself to the inevitable fate of being dashed to pieces [sic] on the sharp and frightful rocks below him."(from Majors 1984b:152).

During this trip, Custer became the first to note in writing the presence of white and pink heather (*Cassiope mertensiana* and *Phyllodoce empetriformis*) and of Mt. Challenger and its glacier. Following their descent into Little Beaver valley, the party established three different camps in trekking their way to the creek's junction with Skagit Valley. Their camp of August 13, their last in the valley, was on the south side of Little Beaver Cr. opposite the mouth of today's Perry Creek. The next morning Custer and his aid Mitchly scaled partway up the steep and rocky mountain to the east in order to reconnoiter their position. Had rain and clouds not turned them around, they would have ascended to the top of the ridge crest that is informally referred to as "Little Beaver Ridge" and whether or not they would have recognized the fact, Custer and Mitchly would have then arrived at an ancient ridgeline route connecting several Hozomeen chert quarries.

Between the 1880s and 1890s several surveyors, including R. M. Lyle and Banning Austin, explored the mountains in the vicinity of Hannegan and Whatcom passes in search of a route that would connect to the Ruby Creek mining claims. Contrary to Austin's recommendation, the Washington State Road Commission failed to appropriate funds to build a road over Whatcom Pass to the Skagit valley (Beckey 2003:278). The explorations of others, particularly early geologists, brought them into the Little Beaver watershed for scientific purposes. Later, under management of the U.S. Forest Service, trails were built primarily to aid in fire suppression. Today this trail system provides access to hikers, climbers, and packers who cross the Pickett range while traveling between the Little Beaver valley and Chilliwack valleys. This is the only maintained trail that today crosses the rugged Picket Range.