SIMILKAMEEN ARCHAEOLOGY
(1993–2004)

by

Stanley Arthur Copp

BA, Simon Fraser University, 1975
MA, Simon Fraser University, 1980

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NAME:	Stanley Arthur Copp
DEGREE:	Ph.D.
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EXAMINING COMMITTEE:	
Chair:	Ross Jamieson Associate Professor
	Knut Fladmark, Professor Senior Supervisor
	Roy Carlson Professor Emeritus
	George Nicholas, Professor Internal Examiner
	Bill Andrefsky Professor and Chair, Anthropology Washington State University Examiner
Date Approved:	July 25, 2006

ABSTRACT

This thesis provides the first synthesis of Similkameen First Nations prehistory. It is based upon archaeological overview, inventory and impact assessment projects (1993–2004). Three main topics are investigated; 1) construction of a cultural chronology encompassing 200 to 10,000 years of valley prehistory, 2) a critical examination of the Plateau Microblade tradition (PMt) , and 3) a discussion of the problem of determining and/or assigning ethnicity to the archaeological record, specifically with regard to protohistoric and pre–contact Similkameen–Athapaskan and Salish–speaking populations.

The construction of a culture history sequence is a necessary prerequisite to an examination of the Plateau Microblade tradition and its relationship to the ethnohistoric presence of Athapaskan–speaking populations in the Nicola and Similkameen River Valleys. The Plateau Microblade tradition is examined and validated as an important technological Plateau material culture complex. Additional material, and non–material, culture indices are examined in terms of whether ethnicity can be constructed for pre–contact populations in the Similkameen Valley.

The results of investigations indicate; 1) that pre–contact populations first inhabited the Similkameen Valley between 7,500 and 10,000 BP, 2) the Plateau Microblade tradition is a valid theoretical construct and 3) determination of ethnicity for Plateau hunter–gatherer and hunter–gatherer–fisher ("foraging") groups within the Similkameen Valley cannot be verified based on current evidence.

Keywords: Similkameen archaeology; Plateau Microblade tradition

DEDICATION

To my parents, Arthur and Edith Copp, and my wife Rena.

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– CHAPTER ONE –

THEORETICAL PERSPECTIVES

This thesis provides the first synthesis of Similkameen First Nations prehistory based upon archaeological overview, inventory and impact assessment projects (1993–2004). These projects have provided a database for three streams of complementary investigations:

- Cultural Chronology ("Culture History"),
- The Thompson–Columbia Plateau Microblade tradition, and
- Determination of ethnicity in the archaeological record.

These three streams of investigation complement one another as each is necessary, beginning with construction of a cultural chronology and the inclusion of an examination of the Plateau Microblade tradition in order to discuss the validity of determining ethnic identifiers in the archaeological record of the Similkameen Valley. These investigations are presented in reverse order to illustrate the rationale of investigation.

Ethnicity and the Similkameen Archaeological Record. Three streams of analysis are linked in that they ultimately contribute towards an evaluation of a Similkameen ethnicity from the archaeological record. Ethnohistoric records indicate the presence of an Athapaskan–speaking population in the Similkameen Valley – the Similkameen–Athapaskans. This population, or populations, is thought to derive from the northern Fraser Plateau by ca. 1200 BP in a migration, or migrations, which saw settlement in the Nicola and Similkameen Valleys as well as along the Pacific Coast of Washington and Oregon.

The Plateau Microblade tradition. An examination of the Plateau Microblade tradition was considered necessary, and a hypothesis that it may represent post–2000 BP Athapaskan–speaking peoples migrating south through the Fraser Plateau into northwestern Washington State (ARCAS Associates 1983; Carlson 1996c; Magne 2001, 2003; Magne and Fedje 2003; Magne and Matson 1984, 1987; Sanger 1967, 1968a, 1970a, b; Stryd and Rousseau 1996; Wyatt 1970). The presence of a microblade technology in the Coquille and Rogue River Valleys in southern Oregon (Connolly 1991; Pettigrew 1978, 1980, 1981), areas of ethnohistoric Athapaskan occupation, has also been seen as evidence of earlier Athapaskan migrations from the Fraser Plateau.

Similkameen Cultural Chronology. Finally, in order to investigate whether or not a pre–contact Similkameen–Athapaskan identity could be determined from the archaeological record it was first necessary to construct a culture chronology dating from the times of earliest occupation to the historic period. Towards this end a number of site surveys and excavations were conducted, most oriented towards the northern two–thirds of the Similkameen Valley. The southern Similkameen Valley was not subject to research as funding with funds mostly derived from British Columbia government projects as well as projects conducted on a pro bono basis. Results of investigations indicated occupation of the Similkameen Valley had commenced ca. 8,000–10,000 years ago, with strong ties southwards to the Columbia Plateau. By ca. 4,500 BP archaeological data indicates ties to both the Columbia and Fraser Plateaus. Later period sites (i.e., post–dating 1,200 BP) form the primary database for determination of Similkameen–Athapaskan identity, although some researchers (Magne and Fedje 2003) suggest an Athapaskan–speaking presence prior to 4,500 BP.

The Project Area

The Similkameen Valley is a deeply–troughed glacial valley that lies between the Cascade and Okanagan mountain ranges in south–central British Columbia. A description of the valley and its environmental resources of the valley are described in Chapter 2. Unlike the adjacent watersheds of the Thompson–Fraser and Okanagan–Columbia drainage systems, the Similkameen Valley has not been intensively investigated archaeologically until recently. Although part of the Columbia River system, the Similkameen Valley is a montane system that is part of a larger inter–plateau physiographic area separating the Columbia and Fraser Plateaus (Chapter 2). This montane inter–plateau area is characterized by most riverine systems draining south into the Columbia River system. The Similkameen is an exception to the extent that it first drains east, then north until it finally bends to the south. Linking drainages include the Tulameen and Pasayten Rivers. Due to the nature of these systems, pre–contact Similkameen bordered, and probably had access to, cultures and resources of the Nicola and mid Fraser–Thompson area to the north, the Okanagan to the east, the Pacific Northwest Coast to the west, and the Columbia Plateau to the south.

The archaeological record is hypothesized to reflect this intermediary position with the expectation that the pre–contact archaeological record would reflect the retention of a more mobile hunting–gathering lifestyle, at least for the Canadian valley. The archaeological record for the American valley most likely exhibits a more sedentary pattern, at least post–4,500 BP, due to the presence of salmon as a relatively stable and reliable food resource. The nine meter tall barrier of Squantlen Falls, south of the 49th Parallel in the United States, is thought to have effectively blocked anadromous species from the Canadian Similkameen valley (Chapter 3). As such, the archaeology of the Canadian valley was hypothesized to represent a greater emphasis on mobile hunting–gathering subsistence strategies reflected in the archaeological record by a relative lack of villages and semi–subterranean houses and storage features, but a high proportion of logistical encampments.

Slightly more than a decade of field research involving site surveys across the Canadian Similkameen ecological system paired with site excavations in, or close to, valley bottomlands supports this contention (Chapter 4). The results of surveys and excavations provided enough detail to construct a Similkameen cultural chronology (Chapter 4 and Appendix A) as well as an evaluation of the role and significance of microblade technology in the valley and larger Thompson–Columbia Plateau region (Chapter 6). This data was then evaluated in terms of methodological and theoretical considerations oriented towards determination of a Similkameen–Athapaskan ethnic identity during, but not necessarily limited to, the last 1,200 years of the chronology (Chapter 7). Political issues affecting the development and implementation of fieldwork research designs were a significant factor that sometimes limited the scope of work. These are discussed in Chapter 7.

Chapter 8 summarizes the results of investigations:

- the 8,000–10,000 year–long Similkameen cultural chronology,
- the validity of the Thompson–Columbia Plateau Microblade tradition, and
- the inability to determine the presence, or absence, of a Similkameen–Athapaskan population based on the archaeological record of mobile hunter–gatherers.

Similkameen Cultural Chronology

Construction of a cultural chronology is not the only primary goal of archaeological research, but it is a necessary first step in the development of archaeological theory and vice versa (see Spaulding 1960; Willey and Phillips 1958 for discussion of the basic tenets: time, space and form). The culture chronology for the Similkameen Valley prior to that reported here was restricted to three broad chronological periods: Early, Middle and Late (Copp 1996a, b; 1997a). The results of fieldwork are derived primarily from contract work carried out by the author, and are compiled in Appendix A. The chronology developed from this data dates from 200 to 10,000 BP derived from site surveys, excavations, radiometric dating, volcanic tephra dating and extra–regional comparisons. It comprises an early period (Nxacin Phase), a middle period (Acnol'ux and Tcutcuwi'xa Phases) and a later period (Snazai'st and Sxwalhani.t Phases), see Figure 1.1. The Acnol'ux Phase is defined as a regional variant of a Columbia Plateau–wide *Cascade Horizon* discussed in Chapter 5.

Late Period	**Sxwalhani.t Phase** **Snazai'st Phase**	200–1,500 BP 1,500–2,500 BP
Middle Period	**Tcutcuwi'xa Phase** **Acnul'ox Phase**	2,500–4,500 BP 4,500–7,500 BP
Early Period	**Nxacin Phase**	7,500–10,000 BP

Figure 1.1: Similkameen Phases

Cultural Chronology Frameworks

Most archaeological research is predicated upon the existence of a temporal cultural historical framework. Willey and Phillips (1958: 22) defined the primary cultural historical integrative unit as the "Phase". A Phase "possess(es) traits sufficiently characteristic to distinguish it from all other such units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the magnitude of a locality or region and chronologically limited to a relatively brief interval of time". Substitute the terms ethnic group, culture, or society for Phase and subtract "whether of the same or other cultures or civilizations" and you have a working definition of human social–integrative units. For archaeologists, the phase concept may be assumed (*prima facie*) or demonstrated (*a posteriori*) to represent a distinct culture or, at least, a remnant physical manifestation preserved in the archaeological record. Just as material cultural remains are analyzed hierarchically from the trait/attribute level in terms of artifact, feature, sub–assemblage, component and assemblage, Willey and Philips (1958: 11–18) provided archaeologists with temporal–social analytic units: Stage, Tradition and Horizon.

A Stage is perceived as an analytical unit representing a perceived level of social complexity; for example, "foragers" (hunter–gatherer–fishers generally without the use of storage technologies) in opposition to "collectors" (hunter–gatherer–fishers with storage capabilities) (cf. Binford 1980). Stages represent evolutionary levels of socio–economic–political integration presumed to be indicative of *in situ* cultural evolution.

A Tradition is conceptualized as a connection between postulated cultures through time. The term is used in two different ways in the literature: as a cultural–integrative unit of past social behaviour and as techno–complex. In this thesis, the distinction is upper versus lower case; that is Tradition representing the social framework whereas tradition representing technology (e.g., the Plateau Microblade tradition). A Horizon demonstrates widespread and distinctive cultural patterns across a wide geographic area, but over a restricted period of archaeological time. The concept generally subsumes shared ways and styles of doing things as "culture" but does not necessarily identify discrete cultural or ethnic groups. Diagnostic criteria include settlement patterns, house forms, artistic styles and/or artifact types or other sets of cultural materials considered to be reflective of normative cultural behaviour. Patterned relationships among these sets of data can be, and often are, interpreted as cultural identity.

Willey and Philips (1958: 33) were quite specific that a horizon "(is) primarily (a) spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permit the assumption of broad and rapid spread." The mechanisms by which these traits spread may include diffusion, culture contact through trade and intermarriage as well as population movements (migrations). As such, these traits should be identifiable in the archaeological record.

Chronological Patterns and Prehistoric Norms

Lyman et al. (1997) point out cultural chronologies, as perceived by Willey and Phillips (1958), continue to provide the basis for much archaeological research, both practical (the *praxis*) and theoretical. They also indicate that the frames of reference established provide a type of Hegelian dialectical tension as the culture history units of Phase, Stage, Tradition and Horizon (Pattern) are often equated with socio–cultural units (cultures, societies, ethnic groups). They contend, quite rightly, that cultural historical/cultural chronological units are primarily *essentialist* in meaning. An essentialist view of science requires a belief that the past can be discovered by measuring discrete traits (their "essence") and that these traits can be used to separate kinds or types (species or subspecies). This is the basis of archaeological typology (Lyman et al. 1997: 4). Typology allows verifiable quanta (e.g. types, features) to be examined and compared across space and time. For the essentialist, the "ideal" (normal) is the unit of analysis and variations of the norm are subsumed under the type (index fossil).

Social integrative units (i.e. the individual, family, extended family, local residence group, "band, tribe," and other integrative units) reflect *materialist* concepts. A materialist perspective contends that phenomena exhibit a *range* of activities constituting normal and abnormal acts. For a materialist, the range of variation is crucial since typologies are conceptualized static units of measurement. For the essentialist, the ideal (*norm*) is an abstraction. It is the range of variation that is important for determining past behaviour, including its material indices. An example is seen in the stages a large bifacial projectile point exhibits as it undergoes reductive and progressive size and shape restructuring after breakage and re–working episodes. The final shape of the artifact prior to loss or discard may not bear a great resemblance to the original form (cf. Lohse 1985).

The problem for the archaeologist lies within the goal of reconstructing and understanding past cultures from a materialist perspective by studying presumably static, but actually fluid material traits that exhibit ranges of variation; items such as artifacts, features, sites, and settlement patterns. Archaeologists must be *both* materialists and essentialists in order to derive significant patterns from data. A materialist versus essentialist dialectic arises out of a need for a static chronological framework, but one that also recognizes the fluidity of cultures, social groups within cultures, ethnicity and the role/impact of the individual across time. The praxis is that archaeological temporal–spatial–"cultural" units are represented as synchronic units (Phases and Traditions) that are actually diachronic in nature. Conversely, the Horizon is primarily a synchronic concept. This is difficult to present in two–dimensions, so the tension remains implicit in the manner by which past cultures and their inherent variation are perceived.

An additional problem lies within the praxis of "doing archaeology" given the tension between governmental policy and First Nations" (emic) perspectives (cf. De Paoli 1999). Complexity may be inferred by examining material culture items in the context of historical analogs, although cultural values or significances assigned to material objects may not be clear in the archaeological record. The concept of the Phase is a semiotic signifier of a complex system (culture or intra– and inter–cultural variation). It portrays complexity through a form of reductionalist simplicity out of necessity, as cultural patterns are multi–dimensional. Symbols (signifiers) are powerful tools of enculturation. Syncretic adoption of other culture's symbols (for whatever reasons) is a contemporary human constant and, as such, is assumed *(prima facie)* to have occurred in the past.

The question for archaeologists is ... can we really assume this was as evident, or as constant, for past peoples with socio–economic–political practices alien to modern industrialists? For example, were quartz crystal microblades utilized for over 6,000 years in the Similkameen Valley because of their inherent functional capability, given that the raw material was no harder than most cryptocrystalline silicates and dacites, but was more difficult to work and more difficult to obtain, or were they also used for some culturally symbolic purpose? Or, since leaf–shaped lanceolate projectile (Cascade) points are found throughout the northern Columbia and parts of the southern Fraser Plateaus, as well as on the Pacific Northwest Coast, does a range of variation of such point types (Cascade A, B, or C) represent stylistic change ("Horizons"), or is this the result of diffusion, migration and intermarriage amongst peoples of similar lifestyles over a period of time (a Stage)? Could all variants representative of a common ethno–linguistic socio–cultural group (e.g., proto–Salishans) in each area?

Athough projectile points of this general morphology also occur in northern Northwest Coast, Subarctic Athapaskan and Kutenaian areas, only three different ethno–linguistic groups (Salishan, Sahaptan and Athapaskan) historically inhabited the known spatial distribution of this point type in the southern Fraser and Columbia Plateaus. As such, what confidence levels can be assigned to ethnolinguistic inferences about an artifact style that was generally discontinued about 4,500 years ago, especially if protohistoric and early historic epidemics radically altered the pre–existing patterns of culture so as to make historical patterns radically different from those of earlier times (cf. Campbell 1990). One of the more obvious concerns is the tendency to equate distinctive artifact types with ethno–linguistic group boundaries, not always a defendable hypothesis, as opposed to establishing spatio–temporal boundaries, which is defendable. Carlson (1996c: 215–216) maintains that artifact types as ethnic identifiers are valid only during the period of initial settlement when populations were small and acculturation at a minimum.

In order to investigate such questions archaeologists have a large battery of essentialist and materialist tools. However, without a time frame it is difficult to even begin asking questions of socio–cultural systems since time forms the baseline for evolution, whether it is somatic or extra–somatic in nature. The following discussion provides current information of Plateau extra–somatic cultural patterns.

The Plateau Microblade tradition

The Plateau Microblade tradition (PMt) of the Thompson and Columbia Plateaus is defined by the presence of microcores and microblades made from wedge–shaped cores with fluted faces dating ca. 8,400 BP to at least 1,800 BP (Chapter 6). It is found in many areas of the Fraser and northern Columbia Plateaus, including the Cascade Range and was originally defined by Sanger (1969) based upon work conducted in the mid Fraser–Thompson River area. Questions concerning the origins, age, spread and function of microblade technologies permeate much of the archaeological literature concerned with the Pacific Northwest. While it is generally accepted that microcore and blade technologies originated in Western Beringia and first spread by migration and/or diffusion to the New World prior during the late terminal Pleistocene, there is little agreement about the mechanisms by which they spread throughout the Pacific Northwest of North America. Microblade technologies occur in the Western Subarctic, the Northwest Coast and Cascade Range from Alaska to southern Oregon, throughout the Plateaus of British Columbia, Washington and Oregon following the northern and western portions of the Columbia

River, as well as south along the eastern foothills of the Rocky Mountains probably as far as northern Idaho and Montana.

Temporally, microcore and blade technologies occur earliest in the north and appear to be derived from the late Pleistocene, Western Beringian Dyuktai Tradition, spread throughout the Pacific Northwest Coast and Interior Plateaus, then disappear from the archaeological record in various locales from as early as the mid Holocene to potentially as late as 200 to 600 years BP (Chapter 6). Although defined in the late 1960s, the Plateau Microblade tradition of the southern Fraser and northern Columbia Plateau has not previously been systematically reviewed to include work conducted in the later 20th century.

The recovery of Plateau Microblade tradition technology in the form of microcores and microblades of cryptocrystalline silicates, basalts (dacites) and quartz crystal from dated and undated Similkameen Valley components suggested that it would be timely for a re – examination of the role and function of these tools relative to other Plateau areas. In the Similkameen Valley this technological tradition dates ca 1,800–7,400 BP, and is initially present as part of Cascade Horizon assemblages and lifestyles dating ca. 4,500–7,500 BP. Moreover, this technological tradition is shown to persist throughout the record of Similkameen occupation in non–residential, logistical campsites, but probably not in residential village settings. Extra–areal comparisons indicate the persistence of microblade technology until at least 600 BP, particularly in the northern Cascade Range.

Hunter–gatherer Ethnicity and the Archaeological Record

Identification of ethno–linguistic groups in the archaeological record is a subject of increasing importance not only in British Columbia, but globally in terms of national, cultural and ethnicity issues. Land claims issues in British Columbia alone promise to involve uses and abuses of archaeological record and theory to advocate the existence of one or more ethno–linguistic groups in the prehistoric archaeological record. Archaeological studies of this kind focus on specific cultural variables presumed to identify specific ethnicity and/or migration patterns. The focus of this discussion is to critically examine assumptions underlying ethnicity deduced from the archaeological record.

The nature of interaction between two or more cultures has formed the basis of much social anthropological and archaeological theory. The culture area has been the standard unit for cultural and ethnic analysis in North America for much of the 20th century. Lohse and Sprague (1998: 11–13) provide a comprehensive history of the development of the Plateau culture area. The culture area concept links modes of production with the physical or ecological niche in which they were practiced (Kroeber 1939). Kroeber devised regional categories or "culture areas" in North America based upon these two factors as well as population density of an area. The importance of these factors was " on one hand culture can be understood primarily only in terms of cultural factors, but that on the other hand no culture is wholly intelligible without reference to the noncultural or so–called environmental factors with which it in relation and which condition it" (Kroeber 1939: 205). The need for analytic units covering broad geographic areas that allowed for syntheses of cultural variation to be met (Walker 1998: 11–13). All used geographic variables, including watersheds, to define areas with which to examine the interrelationships of historic Aboriginal cultures with physical environments as well as with the archaeological record.

A definition of an historic Aboriginal culture entailed "identification of the tribe and its neighbours, description of geographic location, inclusion of relevant prehistoric and historic data, description of language and comparison of linguistic relations, listing of ecological adaptations and material culture, and discussion of socio–economic organization" (Lohse and Sprague 1998: 11). These variables emphasized non–First Nations etic perceptions. Embedded in ethnographic studies were emic perceptions concerning identification (ethnicity). Ethnic identification may have been of less concern to historic and pre–contact Aboriginal populations than it is to the researchers who study them (Chapter 7). In order to provide a minimal framework for analysis of ethnographic and archaeologically defined cultures historic ethno–linguistic boundaries were established by (Walker 1998: 1) as a heuristic device. In general, three major ethno–linguistic Plateau groupings have been discerned; Na–Dene (Athapaskan), intermediate Salish, and southern Sahaptin.

The culture area concept remains a powerful tool, albeit a reductionist one where the scales involved make it difficult to recognize diversity within such bioecological, geographic and cultural "zones". However, as an etic analytical tool, it remains ... "the clearest and simplest means for understanding the relationship between culture and adaptation as well as an excellent mnemonic device for characterizing the diversity of North American Indian culture" (Garbarino and Sasso 1994: iii cited in Lohse and Sprague 1998: 13).

The last half of the twentieth century saw a reduction in emphasis on diffusionist models of culture through the development of culture–historical archaeology, primarily the result of radiometric dating allowing a shift in theoretical perspectives, although interest in population migrations has remained constant. The establishment of regional culture history sequences and investigation of the nature of social interactions between and among discrete culture areas enabled archaeologists to develop a better understanding of the nature of archaeological cultures.

Attention has also focused on the understanding of interactions between cultures (Lohse and Sprague 1998). A key variable that enabled comprehensive theories of culture change was the introduction of radiometric dating that provided the finer temporal control required by such hypotheses.

Implicit in many of these studies was the assumption that the definition of archaeological cultures or Traditions had some basis in historic or pre–contact "fact". In effect, much of the archaeological record was assumed a faithful reconstruction of past cultural systems, with the observation that similar environments tended to produce coherent cultural adaptive strategies irrespective of regional or global perspectives. Opinions such as this are still present, witness a perceived need to establish ancestral relationships between the remote past and current First Nations communities in the Supreme Court of Canada 1991 decision in *Delgamuukw versus the Crown,* as well as the cultural affiliation of the Kennewick remains in Washington State (Babbitt 2000). This implicit assumption was eventually questioned by the application of the more rigorous hypothetico–deductive research methods advocated by Binford (1977), Plog (1974) and Rouse (1972) among others. This was not a new approach, witness F. Boas' nomothetic approach earlier in the century. What was new was a re–affirmation of the hermeunetic device of rigourous hypothesis development and testing rather than basing models on assumptions about the nature and interpretation of the archaeological record (cf. Trigger 1989). Late 20th century archaeological theory included a reaction against the hypothetico–deductive paradigm, arguing that all hypotheses are grounded in cultural and/or theoretical bias and, as such, are suspect.

The author prefers to take a middle ground, where assumptions about the complex nature of social interactions can be addressed in terms of a more processual approach, with a focus on middle range theory, cultural ecology and dynamic systems models of culture change. Post–processual models continue to be concerned with these issues, but distinguish external factors (environmental) from more purely social factors thought to contribute to cultural development and interaction models of the Contextual and Neo–Marxist archaeologies (Harris 1968; Trigger 1989).

The purpose of this short historical review is to reinforce the idea that human societies and cultures comprise complex networks of variables. Some are external–environmental, over which control has generally been lacking by human agencies until recently. Others are internal–social variables over which societies are generally assumed to have some control either as a direct result of policy (polity) decisions, or indirectly as the result of interactions between and among populations.

In terms of the practical attitude of archaeologists towards identification of ethnicity from the archaeological record, Carlson (1996a: 4) provides a general perspective "(t)he greater the similarity in forms and fabrication techniques of the artifacts and the closer the propinquity of the artifact assemblages in time and space, the greater the *probability* of ethnic congruity of the people who occupied the sites and made the tools. (emphasis added). Assessing probability is an objective goal but, in practice, the definition of ethnicity in the archaeological record has been more of a subjective exercise.

– CHAPTER TWO –

SIMILKAMEEN VALLEY NATURAL HISTORY

A discussion of the topographic and environmental features that comprise the Similkameen Valley is necessary in order to provide a context for the fieldwork and research design that make up this thesis. The southern Similkameen Valley is located in the United States and is the most xeric area of the valley. The American Similkameen also exhibited large runs of the Okanagan–Columbia salmon run south of Squantlen Falls. North of the falls and extending throughout the Canadian Similkameen, salmon were not present. The lack of this resource is hypothesized to have had the effect of limiting development of larger aggregate communities and resulted in the retention of hunting and gathering subsistence strategies while populations in proximity to the falls and confluence of the Okanagan and Similkameen Rivers developed a more sedentary hunting–gathering and fishing lifestyle.

The Fraser Plateau

The study area forms part of the southwestern portion of the Thompson Plateau, an intermediate position between the larger Columbia and Fraser Plateaus of Northwestern North America. The Plateaus form a contiguous physiographic, environmental and ethno–historical and analytical unit for the purposes of archaeological investigations (Cannings and Cannings 1996, Prentice and Kuijt 2004; Walker 1998), although Rousseau (2004) lumps the Thompson and Fraser plateaus into a Canadian Plateau designation to reflect perceived differences between the two larger drainage systems. The Similkameen Valley and the adjacent Okanagan Valley to the east are northernmost extensions of the Sonoran desert biome that extends from the Great Basin north through the Columbia Plateau to the southern portions of the Thompson Plateau (Figures 2.1 to 2.3). As such, it is expected to share many traits with both the Columbia and Fraser Plateaus. The Similkameen Valley is part of the Plateau culture area of North America (Kroeber 1939; Ray 1939). This includes the major interior river drainages of the Fraser and Columbia systems (Ames et al. 1998) and is a larger cultural province bordered by the Rocky Mountain Trench to the east, the southern edge of the Cariboo–Chilcotin to the north, the Cascade and Coast Mountains to the west and the Blue mountains south of the International Boundary. Or, "the region drained by the Columbia and Fraser Rivers excepting certain portions of the northern Great Basin by the Snake River" (Walker 1998: 1).

The Columbia Plateau

In terms of physiology, environment and culture the Columbia Plateau can be defined as those areas lying within the drainage system of the Columbia River, including its principle Kootenay, Clark Fork–Pend Oreille, Spokane, Yakima, Snake and Williamette River tributaries (US Army Corps of Engineers 1952: 8–9, cited in Cressman 1973: 19). Also included are the Chelan, Methow, and Similkameen Rivers that drain out of the Cascade Mountains, as well as the Okanagan River. Although Ray's (1939) division between the Columbia and Fraser Plateaus was arbitrarily set at the international border, Kroeber (1939) included portions of the Kootenay River Valley and Arrow Lakes within the Columbia Plateau. Richards and Rousseau (1987) and Rousseau (2004) also provide convincing archaeological and ecological arguments for a division north of the border, cross–cutting the Okanagan–Similkameen and Lakes First Nations' traditional territories.

The northern Columbia Plateau sub–culture area boundary can be provisionally set at the confluence of the Methow and Columbia Rivers northwards to include the Similkameen and Okanagan Valleys based upon ethnolinguistic, cultural and ecological traits (Campbell 1984, 1985; Chatters 1986; Cressman 1977; Kroeber 1939; Nelson 1969; Schalk 1980; Strong 1959; Swanton 1952) similar to those in south–central British Columbia. An exception is made for archaeological materials recovered on western slopes of the Cascade Range divide. These are the important sites of Judd Peak and Layser caves near Mount Ranier (Daugherty et al. 1987a,b; Hicks 1997). The eastern boundary runs a short distance west of the Washington–Idaho border north to the Vallican–Slocan Junction area. The western boundary is set at the intersection of the Cascade and Coastal Mountain ranges and includes the Methow River valley of Washington State as well as the Similkameen, Ashnola and Pasaytan River drainages of southern British Columbia.

British Columbian Biogeoclimatic Perspectives

The primary system of mapping biogeoclimatic variability within the province is a system of biogeoclimatic zones (Demarchi 1993, 1996) ecoregion classification system. Krajina (1969) originally developed the concept of biogeoclimatic zones for British Columbia based on averaging dominant tree species in climax (mature) forests and grass species in non–forested areas. Each zone could then be sub–divided according to climatic and vegetation variables. Fourteen major zones are recognized based on Krajina's criteria. Relevant biogeoclimatic zones include: Interior Cedar–Hemlock, Interior Douglas–fir, Ponderosa Pine, Bunchgrass, Montane Spruce, Engelmann Spruce–Subalpine Fir and Mountain Hemlock zones (Ministry of Forests Biogeoclimatic Zone Map 1991) (Figure 2.4).

Demarchi's (1993, 1996) ecoregion classification system recognizes the mosaic nature of biogeoclimatic zones. It also recognizes that biogeoclimatic zones, particularly in mountain terrains, follow ridges and contour intervals with elevation. An example provided by Cannings and Cannings (1996: 89) illustrates this as "Western Red Cedars in the southern Interior can live quite happily in the Bunchgrass Zone, as long as they are beside a creek in a cool, dark canyon, and they will also grow along the same creek in the Interior Douglas–fir and Montane Spruce Zones upstream".

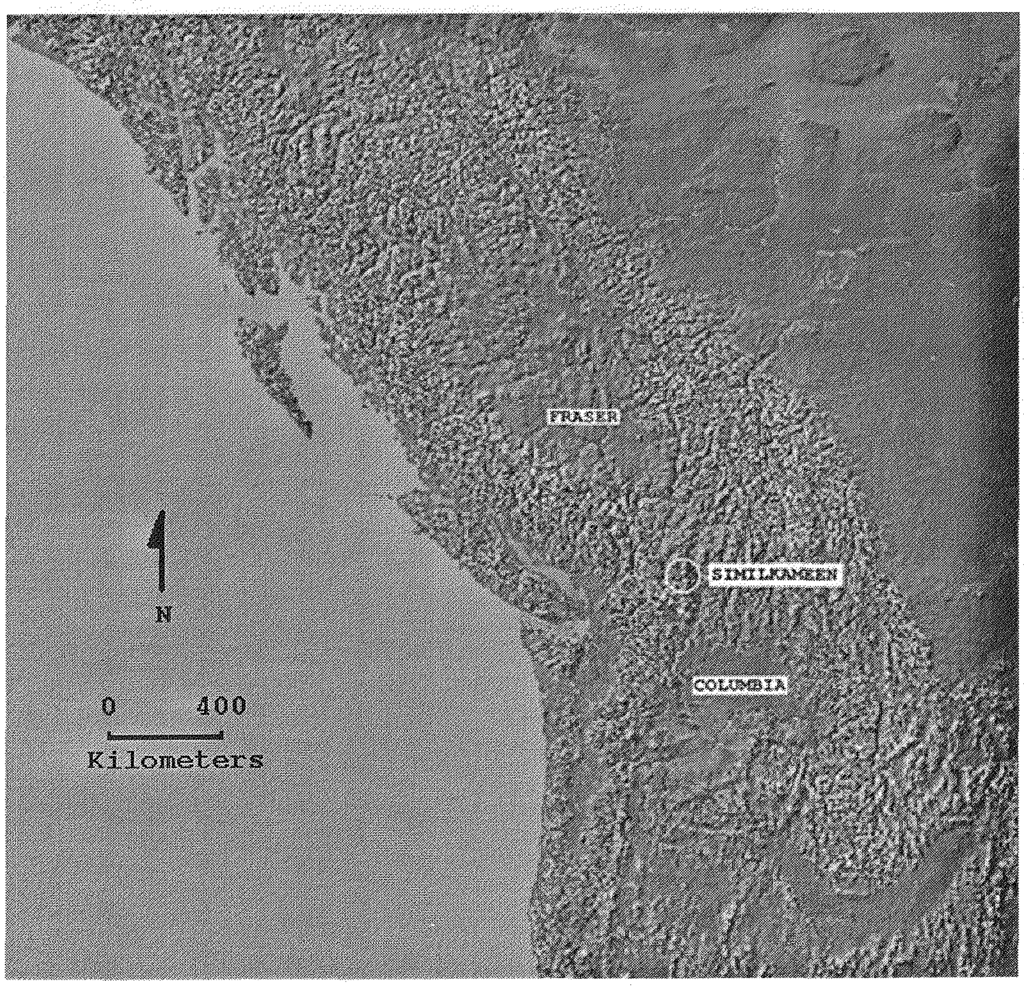

Figure 2.1: The Pacific Northwest with Project Area

(after Sterner 1977, Johns Hopkins University Applied Physics Lab, with permission)

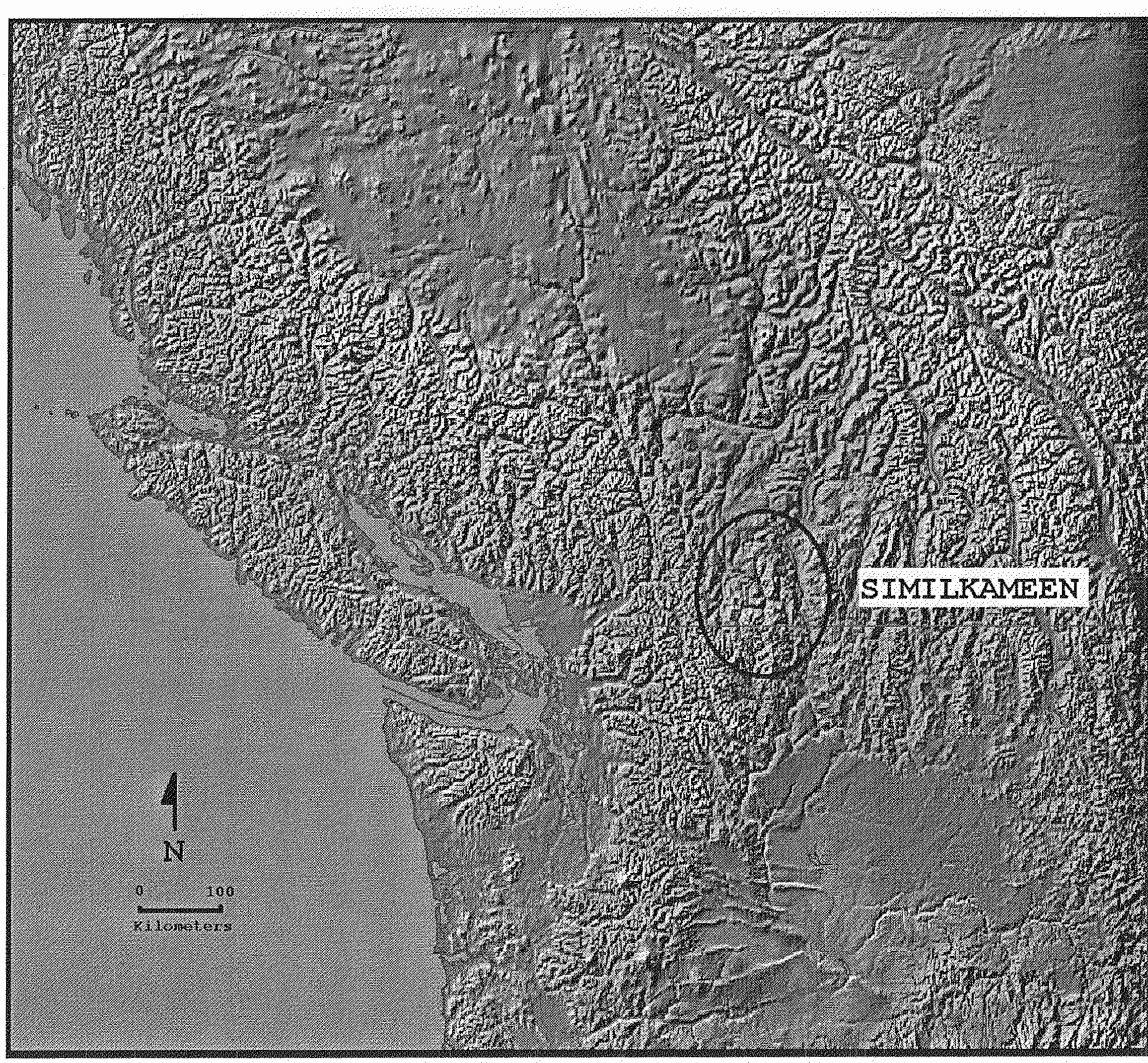

Figure 2.2: The Similkameen Valley

(after Sterner 1977, Johns Hopkins University Applied Physics Lab, used with permission)

Figure 2.3: Satellite Photo of Okanagan–Similkameen

(after Nasa Johnson Space Center STS 639–96–64 [eol.jsc.nasa.gov] 2002)

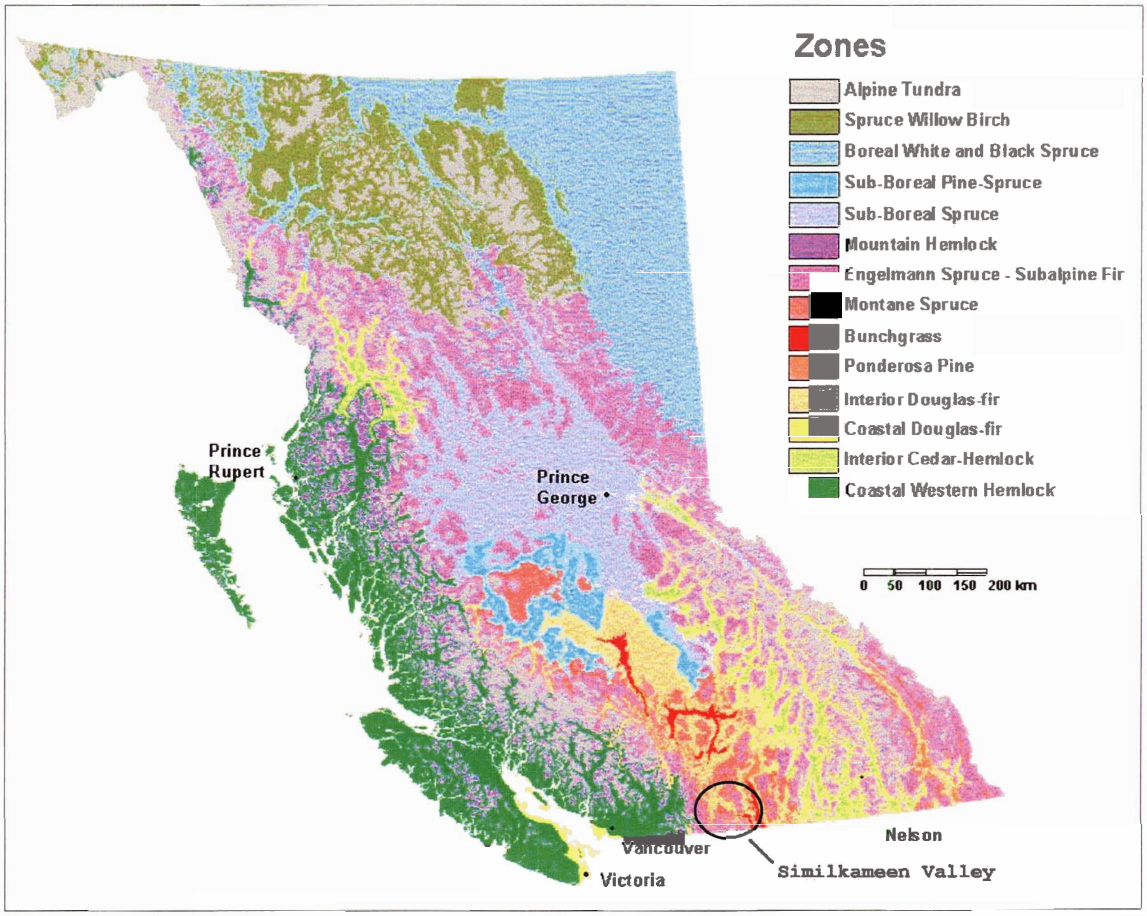

Figure 2.4: British Columbia Biogeoclimatic Zones

(after Cannings and Cannings 1996: 92, Map 16)

In order to understand the biotic resource base available to pre–contact Similkameen populations it is necessary to understand valley biodiversity. For example, Cannings and Cannings (1996: 89) point out that animals in montane and montane valley environments will often exploit several mosaic environments in the course of a day. However, since the Canadian Similkameen Valley exhibits steep vertical relief, these mosaic environments would have been within a 24 to 72 hour catchment area for resident hunter–gatherers. As such, ecoregions provide a template for archaeological inferences based upon the complex interactions between floral and faunal communities. Ecoregions are based on climatic factors, but depend more heavily upon physiographic variables (i.e. valley, montane and plateau). Ecoregions present in the Similkameen Valley system include the following: Bunchgrass (BG), Ponderosa Pine (PP), Interior Douglas Fir (IDF), Montane Spruce (MS), Engelmann Spruce–Subalpine Fir (ESSF) and Alpine Tundra (AT) zones (Stevens 1995). The ecoregion concept provides an excellent congruence among climatic, ecological, physiographic and cultural variables for the study of past human use of the Similkameen landscape in following sections of this chapter.

The Similkameen Valley

Originating in the Hozameen Range, the Similkameen River flows southeast through a glacier–cut valley trough to the Columbia River (Figures 2.5 to 2.8) and joined at the town of Princeton by the Tulameen River from the northwest. The Tulameen valley is located on the eastern edge of the Southern (Fraser) Plateau where it terminates against the Cascade and Hozameen Mountain ranges of Southeastern British Columbia. The Ashnola River, the other majority tributary, joins the Similkameen River upstream of the town of Keremeos in the southern portion of the valley.

These valley systems were formed in glacial and pro–glacial sediments, including glacial till overlain by glacio–fluvial outwash deposits. Post–glacial alluvial and colluvial deposits mantle valley sides and exhibit down wasted colluvial debris fans, chutes and slides oriented toward the valley floor (Green and Lord 1979, Ryder 1971). Deglaciation began sometime after 11,500 BP with the modern valley topography developing by ca. 10,000 BP (Hebda 1995; Ryder 1971; Pellatt 1996). Average elevations range from 1400–1750 meters above sea level with a minimum elevation of 805 meters. The Tulameen River drains south through a deeply cut U–shaped valley formed by glacial action and filled with outwash deposits to its confluence with the Similkameen River. Numerous small lakes occur in highland areas west and east of the main valley, with larger lakes in the main and side–valleys such as Otter, Missezula and Allison Lakes. The small communities of Coalmont, Tulameen, Brookmere, Kingsvale and Aspen Grove serve as foci of permanent residence today. Larger towns occur approximately 100 kilometers north (Merritt) and south (Princeton) of the Tulameen valley centre.

Local climate is transitional West Coast Marine–Southern Interior Dry Belt characterized by warm, dry summers and cool, but occasionally cold, winters (see Tables 2.1 and 2.2). Tulameen Valley local vegetation (Green and Lord 1974) consists of park–like stands of Ponderosa Pine and Interior Douglas Fir interspersed by dry grasslands at lower elevations near valley bottomlands. Local grasses include Bluebunch wheat grass, Idaho fescue and needle grasses. The PP through IDF understories support bearberry, arnica, twinflower and pine grasses, depending upon slope, drainage and exposure. Higher elevations consist of stands of Lodgepole Pine (considered part of the Montane Spruce ecozone) and Englemann Spruce and Sub–alpine Fir huckleberry, false–box, wintergreen and arnica.

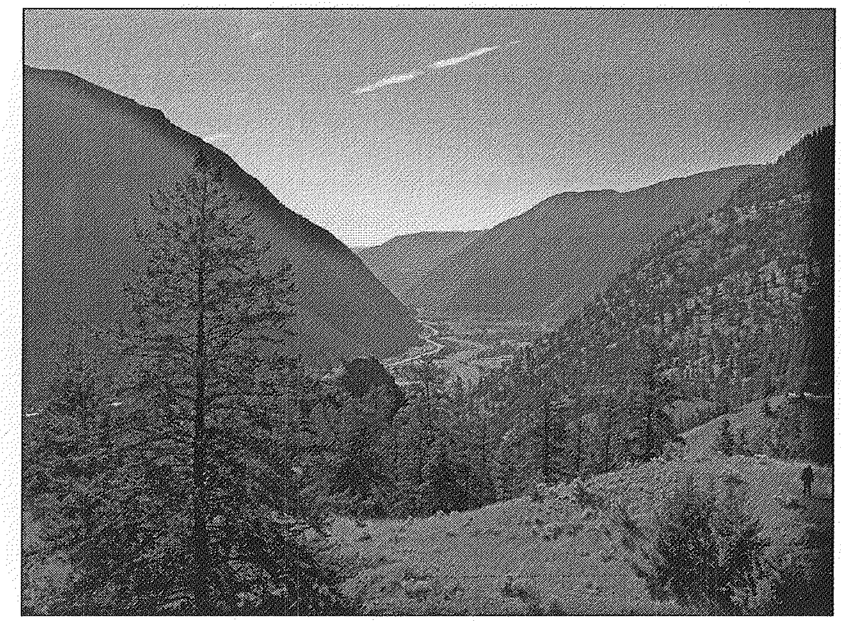

Figure 2.5: North–central Similkameen Valley.

View: North from Sterling Creek Vicinity,
note valley trough infill with remodeled glacial sediments

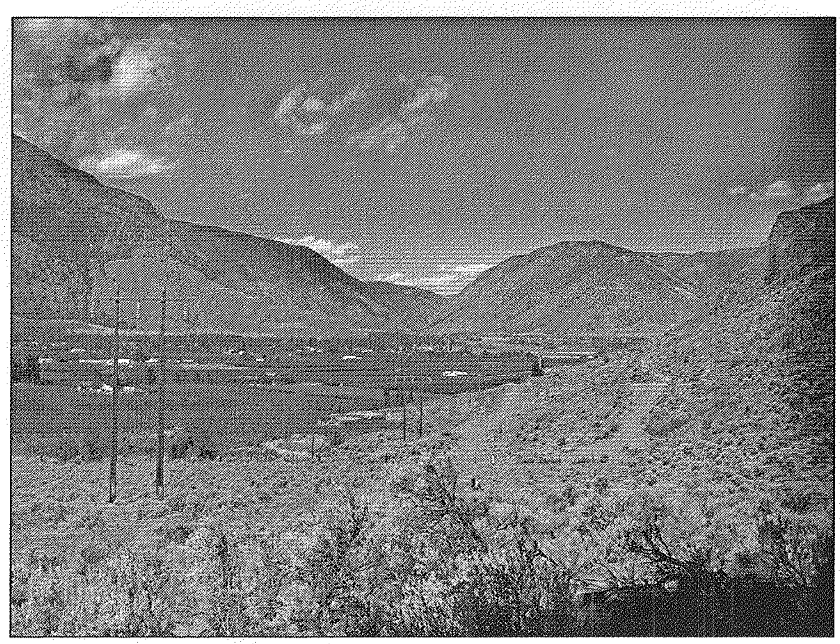

Figure 2.6: Mid–Similkameen Valley.

View: North from Blind Creek (IR #6),
Note widened, xeric valley

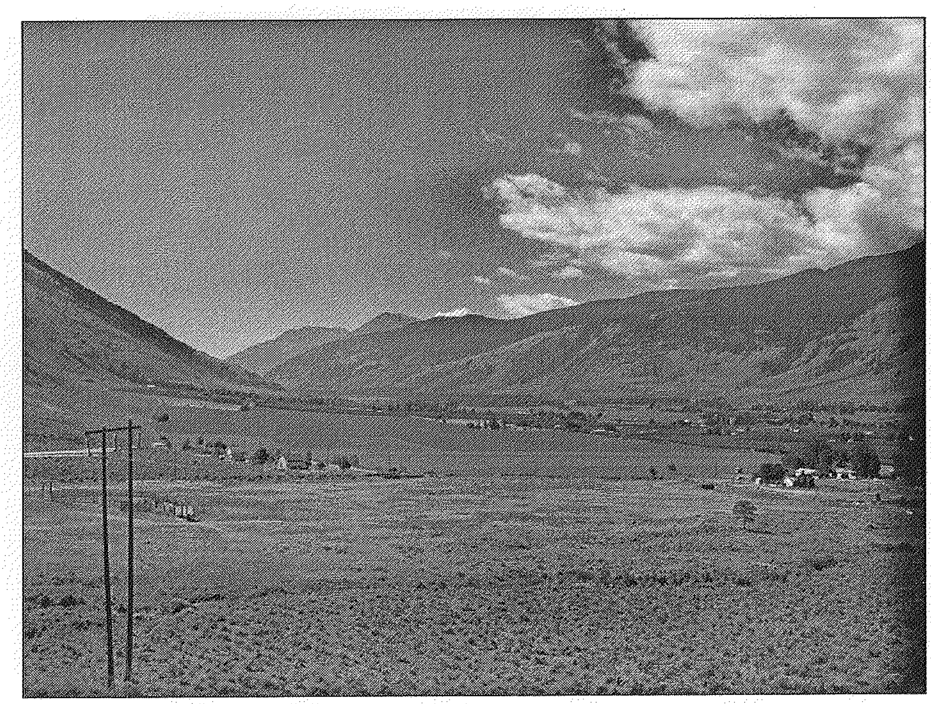

Figure 2.7: Southern Similkameen Valley near Cawston.

View South from Blind Creek (IR #6),
Note effects of agriculture on xeric bottomlands

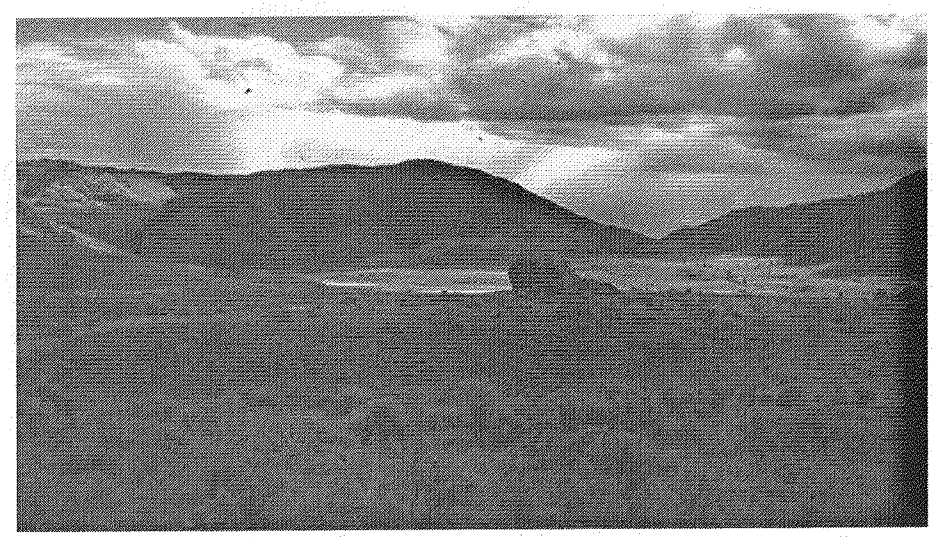

Figure 2.8: Southern Similkameen Valley near the International Boundary.

View: South towards Glacial erratic locally known as "Goat Rock",
note the xeric nature of the landscape and lack of forested mountain slopes

Table 2.1: Mean Temperatures and Precipitation, Allison Pass to Tulameen Valley (after Green and Lord 1974: 13)

	Allison Pass 1340 m ASL		Manning Park 1218 m ASL		Copper Mtn 1202 m ASL		Osprey Lake 1097 m ASL	
	Temp °C	**Prcp mm**	**Temp °C**	**Prcp mm**	**Temp °C**	**Prcp mm**	**Temp °C**	**Prcp mm**
Jan	–7.3	224.0	–7.3	146.0	–6.2	38.0	–8.8	73.7
Feb	–4.5	163.0	–3.9	104.0	–3.4	41.0	–6.1	58.4
Mar	–3.4	124.0	–2.2	79.0	0.0	30.0	–2.2	40.6
Apr	1.1	90.0	–2.2	50.0	4.5	30.0	3.8	25.4
May	3.9	69.0	7.3	37.0	8.4	38.0	9.4	30.5
Jne	8.4	53.0	9.5	33.0	11.0	56.0	11.7	48.3
Jly	12.0	36.0	15.0	24.0	16.0	28.0	15.0	33.0
Aug	12.0	58.0	13.0	32.0	16.0	23.0	13.3	33.0
Spt	7.8	69.0	10.0	57.0	11.0	23.0	10.6	30.5
Oct	3.4	109.0	4.5	80.0	6.2	43.0	4.4	43.2
Nov	–3.4	218.0	2.2	123.0	–1.7	48.0	–2.8	53.3
Dec	–6.2	208.0	–5.0	122.0	–4.5	51.0	–6.1	81.3
Year		933.0		522.0		205.0		551.2

Table 2.2: Mean Temperatures and Precipitation, Southern Similkameen Valley (after Green and Lord 1974: 13)

	Princeton 632 m ASL		Hedley 524 m ASL		Keremeos 430 m ASL		Osoyoos (*) 275 m ASL	
	Temp °C	**Prcp mm**	**Temp °C**	**Prcp mm**	**Temp °C**	**Prcp mm**	**Temp °C**	**Prcp mm**
Jan	–6.7	47.1	–4.3	31.9	–3.4	25.0	–2.9	38.4
Feb	–2.6	24.9	–0.5	18.1	–0.6	20.0	0.8	28.5
Mar	2.0	16.2	4.2	18.0	5.0	15.0	5.4	22.5
Apr	6.4	18.1	8.5	26.0	10.6	15.0	10.3	20.9
May	10.7	23.4	12.9	34.1	15.0	23.0	14.8	37.6
Jne	14.8	29.5	16.8	38.3	18.0	33.0	18.9	32.1
Jly	17.6	28.6	19.8	33.6	22.0	20.0	21.8	21.9
Aug	17.5	25.6	19.5	33.6	21.0	20.0	21.3	28.0
Spt	12.8	21.5	14.5	23.5	17.0	18.0	16.4	16.6
Oct	6.6	20.5	8.1	18.2	10.0	18.0	9.9	16.8
Nov	–0.6	38.0	1.3	27.8	2.2	25.0	3.7	29.8
Dec	–6.2	49.6	–3.6	36.0	–1.1	25.0	–1.0	47.1
Yr		343.0		339.3		257.0		340.2
#days >0°C	310.0		324.0		333.0		n/a	

(*) Values are given for Osoyoos in lieu of Chopaka in the extreme Canadian Southern Similkameen due to lack of available data for the latter. Both areas share similar latitude and elevations.

Alpine Tundra (AT) zone vegetation (above 2380 meters) includes stunted open parkland belts and *krummholz* of Sub–alpine fir with blueberries, false heathers, arnica, mountain valerian, sedges and grasses (Green and Lord 1974; Stevens 1995).

The climax forests of Ponderosa Pine (PP), Douglas Fir (IDF) and Englemann Spruce (MS and ESSF) are being increasingly logged, with replacement forests of Englemann Spruce predominating on modern slopes, although Lodgepole Pine may be present (Green and Lord 1974: summary). Similar conditions prevail westward along the Similkameen and Tulameen Rivers towards Allison Pass. There is a gradual replacement of lower elevation Ponderosa Pine and Douglas Fir (PP and IDF) with Englemann Spruce and Sub–alpine Fir (ESSF) from Princeton to Similkameen Falls where ESSF and west to the headwaters of the Similkameen River. Most of the modern valley floor and lower slopes between Princeton and the 49th Parallel exhibit semi–arid floral communities characterized by the Bunchgrass (BG) ecozone of sagebrush–bluebunch wheat grass–needle–and–thread grass and Idaho fescue. This habitat is generally found below 900 meters in elevation. The Ponderosa Pine (PP) ecozone consisting of a Ponderosa pine–bluebunch wheatgrass–Idaho fescue habitat also occurs on outwash terraces and lower mountain slopes below 900 meters ASL (above sea level) (Figure 2.9).

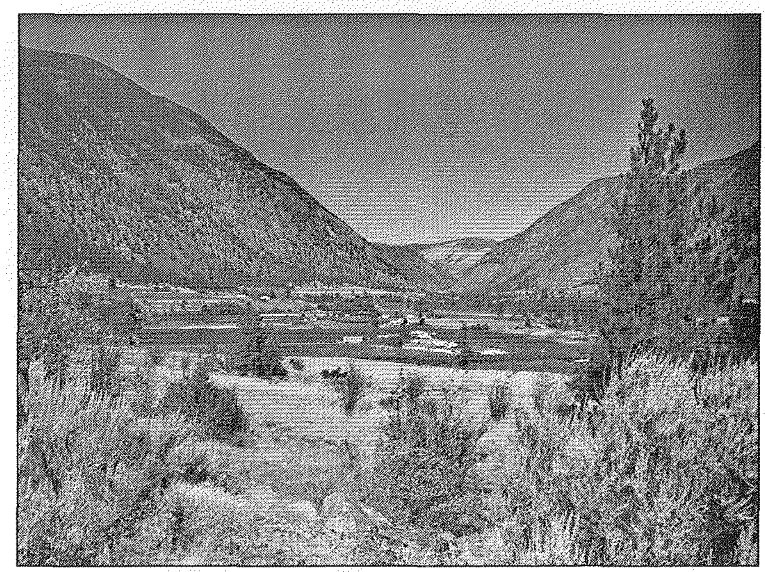

Figure 2.9: Ponderosa Pine–Bluebunch Wheatgrass Ecozone.

View: North from mid–valley.
Note xeric vegetation versus cultivated bottomlands

The Interior Douglas fir zone (IDF) succeeds the Ponderosa Pine zone and is characterized by fir and communities of bluebunch wheatgrass, Idaho fescue and pine grass locales along with Lodgepole pine this zone lies above 1,000 meters ASL. The Montane Spruce (MS) zone occurs at mid–elevations between ca. 1,000–1,350 meters ASL. It is characterized by

Engelmann and hybrid Spruce species as well as Sub–alpine Fir. As previously indicated, it is considered to be a transitional zone between the warmer, drier IDF and cooler, wetter ESSF zones (Figure 2.10).

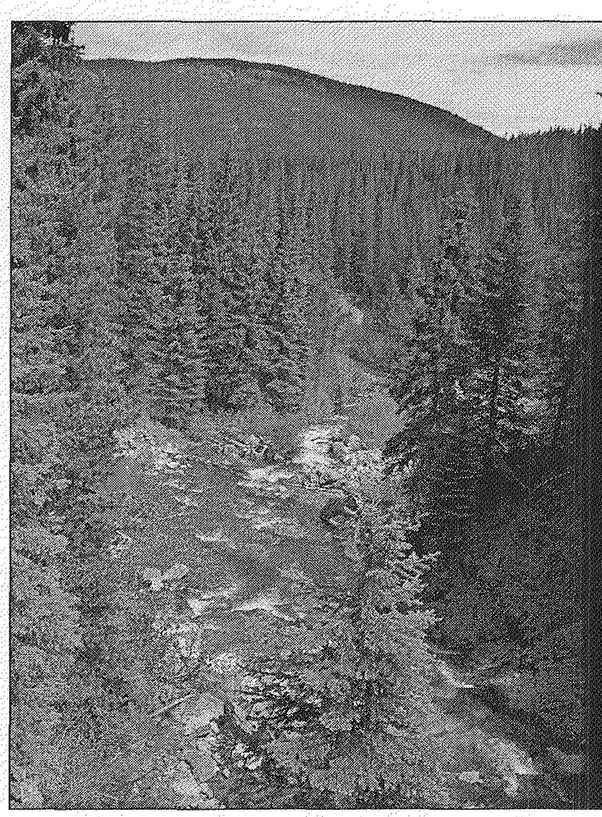

Figure 2.10: Montane Spruce (MS) to ESSF transitional Ecozone

The Engelmann Spruce–Subalpine Fir (ESSF) zone lies between the IDF and/or MS and Alpine Tundra (AT) zones within a range of ca. 1,350–2,100 meters ASL. Subalpine Fir is considered the climax species, but Engelmann Spruce and Lodgepole pine also occur (Figure 2.11). Rocky Mountain Douglas Fir and Mountain Hemlock are also found, with Whitebark Pine replacing Lodgepole Pine near the upper limits of the zone. The Alpine Tundra (AT) zone (Figure 2.12) lies above tree line and supports communities of mosses, lichens, grasses and sedges (Green and Lord 1979: 119–127).

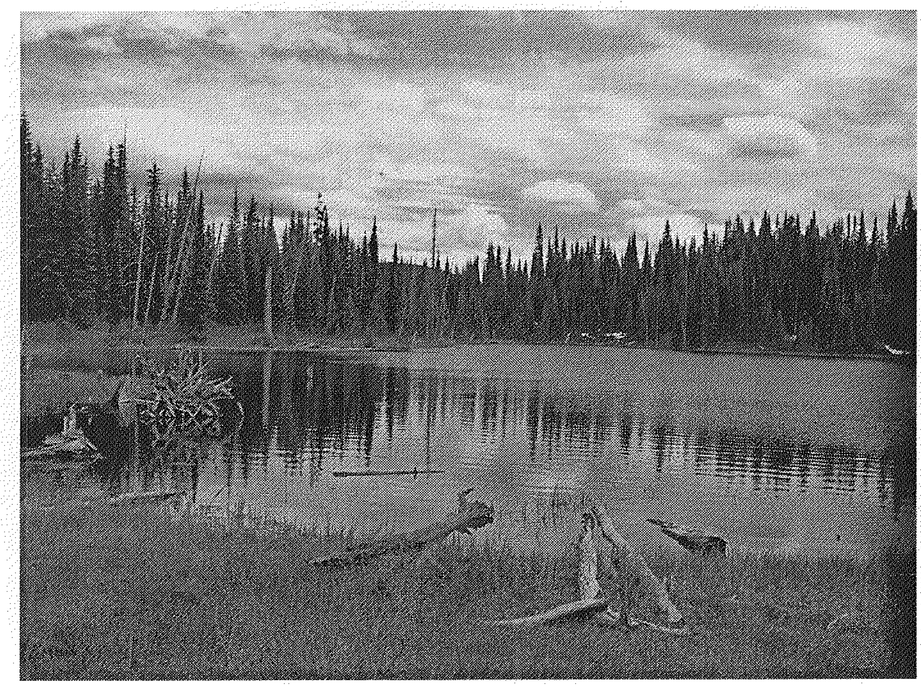

Figure 2.11: Engelmann Spruce/Subalpine Fir Ecozone

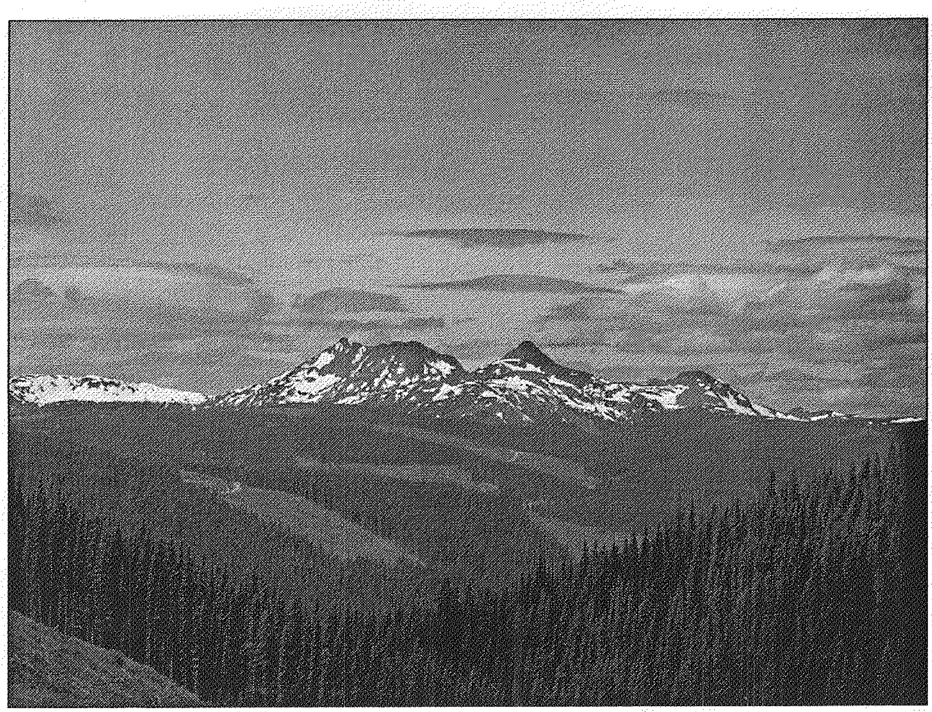

Figure 2.12: ESSF to Alpine Tundra.

View: East toward Cathedral Lakes Park

Local climate is influenced by Continental and Maritime weather systems with mostly dry summers and cold, cloudy winters. Mean summer temperatures average 16 degrees Celsius and mean winter temperatures average –10 degrees Celsius. Precipitation on an annual basis averages over 250 mm, including snowfall (Green and Lord 1979). But there is considerable regional variation from the headwaters of the Similkameen near Allison Pass south to Keremeos (See Tables 2.1 and 2.2).

Temperature and precipitation patterns vary with altitude and latitude and exhibit numerous micro–environmental sub–zones. Lower elevation biogeoclimatic zones become increasingly dryer and warmer as one progresses downstream from river headwaters. A major biogeoclimatic boundary is encountered in the Princeton Basin and another a few kilometers upstream of the Similkameen and Ashnola Rivers confluence near the town of Keremeos. This latter area exhibits a Sonoran bioclimate marked by sagebrush and more xeric floral and faunal communities, a trend that intensifies south to the International Boundary. Pockets of sagebrush can be observed west of Princeton and may represent relict ecological conditions dating to the early Holocene.

Northern Similkameen Palaeoclimates

Hebda (1990, 1995, 1997, 1999), Heinrichs (1999), Heinrich and Hebda (2001), Heinrichs et al. (1999) and Pellatt (1996) provide the most recent palaeoenvironmental data relevant to this study. Pellat's (1996) studies of fossil pollen recovered from small upland lakes on Mt. Stoyoma (Cascade Range) northwest of Merritt offers one of the most recent palaeo–environmental syntheses of southwestern British Columbia. His data, collected at elevations between 1,850 and 2,050 meters ASL, indicate that rapid warming heralded the end of the last glaciation about 10,000 BP (Figure 2.8). Heinrichs and Hebda (2001) summarize similar results for investigations at Mt. Kobau and Crater in the southern Okanagan and Similkameen Valleys. From approximately 10,000 to 7500 BP, the climate remained warmer and dryer than recent (xerothermic). Climax vegetation in the Southern Interior Plateau was non–analog Engelmann Spruce–Subalpine Fir parkland during the immediate post–glacial period. Hebda (1995, 1997, 1999) indicated the prevalence of grasses and sage biotic communities to elevations of ca. 1,300 meters ASL, supplemented by Rocky Mountain Juniper (*Juniperus scopularum*), soapberry (*Shepherdia canadensis*) and willows (*Salix spp.*) through most of the montane areas of interior British Columbia at about that time. Terminal Pleistocene upland areas were forest–steppe communities, Pellatt's (1996) non–analog ESSF zone.

The ESSF zone currently has the highest elevation forest in southwestern British Columbia. Climate in these high altitude forests and parklands is cold and moist, with a short growing season and long, cold winters. Up to 50–70% of precipitation falls as snow and local soils generally freeze during winter. The early post–glacial environment was characterized by non–analog ESSF parkland conditions, indicating that tree lines were as much as 100 meters above modern, with warmer than modern temperatures. ESSF zones changed from park land to closed forests by ca. 7,000–3,500 BP at higher elevations (Pellatt 1996: 159), indicating a shift to moister precipitation patterns in warmer than modern local environments. This Mesothermic period represents a period of precipitation comparable to the present, but with warmer temperatures (Figure 2.13). Hebda (1995) provides dates of ca. 4,500–8,000 BP for these phenomena, when grasslands were shrinking, but were more prevalent than today. Complicating these changes is evidence of a neoglacial cooling period, with glacial re–advances sometime after 5,370 ± 70 BP (Pellatt 1996: 157) that had differential effects depending upon local microenvironments.

Hebda (1995) suggests that there was an extension of a Holocene maximal warm period (or Hypsithermal) to about 4,500 BP over a wide area of southwestern British Columbia. Due to differences in location, elevation, geomorphology and other variables this warm interval was both initiated and terminated at variable times throughout southwestern British Columbia. High altitude forest–steppe environments moved down slope and wetlands expanded particularly between 4,000–5,000 BP. Verification of Hebda's 4,500 BP terminal estimate for more open parklands, at least in the Upper Similkameen, takes the form of a sample of Interior Douglas Fir derived from basal sediments dredged from Kennedy Lake, west of Princeton at 1,100 meters ASL where Douglas Fir is currently a minor occurrence in stands of Lodgepole pine (*Pinus contorta*). A sample of a submerged Douglas fir log, submitted by the author, was dated to 3,930 ± 50 BP (Beta–176644). At one sigma this provides an age range of 4,290–4,430 cal BP. Earlier climax vegetation was most likely characterized by the Ponderosa Pine–Bunchgrass biota. Earlier climax vegetation was most likely characterized by the Ponderosa Pine–Bunchgrass biota. As we shall see, these changes may explain shifts observed in the archaeological record where early to mid–Holocene (10,000–4,500 BP) adaptive strategies were replaced by montane–forest ecozone adaptations.

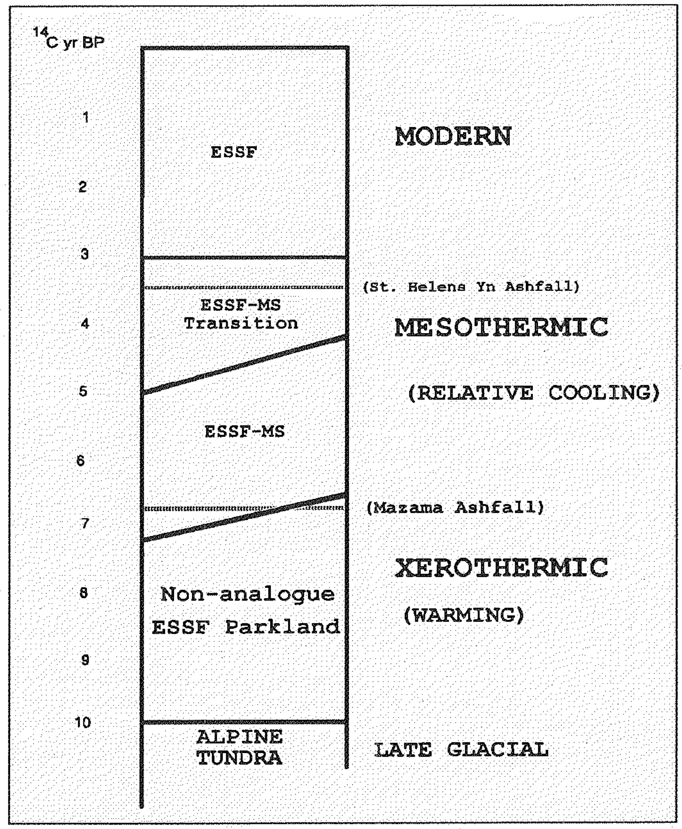

Figure 2.13: Similkameen Palaeoenvironments (at Tree Line)
(after Pellatt 1996)

After 3,500 BP, temperatures generally stabilized into the modern pattern albeit with neoglacial fluctuations during the 12th to 14th centuries AD. Earlier neoglacial events appear to have been initiated at the highest elevations (over 2,000 m ASL) as early as 5,300 BP (Pellatt 1996: 159). These data emphasize regional and local variability in climatic evolution throughout the area and emphasizes differences between lowland river valley and highland climatic impacts.

Southern Similkameen Palaeoenvironments

Heinrichs (1999) conducted research in the southwest Okanagan and Ashnola River regions. He focused on the Engelmann Spruce–Subalpine Fir Biogeoclimatic zones at Mt. Kobau in the south Okanagan Valley, at Crater Mountain north of the Ashnola River and Cathedral Lakes south of the Ashnola River. An additional summary of these results can be found in Heinrichs and Hebda (2001). His research indicates a late glacial (> 10,000 BP) Artemesia (sagebrush) steppe with a cold/dry environment. The early Holocene was characterized by rapid warming (xerothermic) between 9,500 to 10,000 BP. This resulted in micro–environmental differences between the two sites. Mt. Kobau was covered in grasslands whereas Crater Mountain slopes were covered with open canopy Pine parklands. The Cathedral Lakes area exhibited a closed canopy Pine forest. Between 4,000 and 7,000 BP there was an increase in moisture content and increased levels of wildfire severity in all three areas. Mt. Kobau was characterized by open–canopy Pine parklands and the Cathedral Lakes area showed increasing levels of mixed *Abies lasiocarpa* (Subalpine Fir) and Engelmann Spruce forest. The late Holocene (< 4,000 BP) showed a shift to Engelmann Spruce–Subalpine Fir closed canopy forests in all three areas, attributed to Neoglacial cooling (see section following). To this can be added recent data from Kilpoola Lake situated at 815 meters ASL west of Osoyoos. Heinrichs et al. (1999) analyzed sediment cores from the lake. Palynological and radiometric estimates indicate the presence of some pine, possibly *Pinus contorta*, although not in sufficient quantities to suggest stands of trees within the valley prior to 10,750 ± 60 BP. From this time to approximately 6,000 BP the valley and uplands nearby were comprised primarily of sage (*Artemesia tridentata*)–steppe (grasses). Today the area lies within the Ponderosa Pine–Bunchgrass bioecological zone and is characterized by wide grassy meadows interspersed with sage with sparse stands of pine.

Crater Mountain (Ashnola River watershed) illustrates how similar, yet complicated, responses to post–glacial environments can be. Heinrichs and Hebda (2001) state that late glacial vegetation consisted of sagebrush–grass steppe interspersed with krummholz spruce and subalpine fir, followed by pine parklands with scattered birch and alder. By 6,500–8,000 BP Douglas Fir was present, followed ca. 4,000–6,500 BP by Pine forests with patchy alder and birch. Increased cooling and moister regimes occurred by ca. 4,000 BP, characterized by subalpine fir and spruce in a mosaic including succession pine forests similar to early Holocene forests. By ca. 1,600 BP spruce and fir were dominate, but with large areas of open grassland similar to modern.

Hebda (1995, 1997, 1999) suggests that the early to mid–Holocene sage–steppe ecological situation was extremely widespread in the valley. He estimated that the sage–steppe biota probably extended to 1,500 meters ASL in some areas and that the existing Interior Douglas Fir zone would have been almost entirely replaced by Ponderosa Pine–Bunchgrass at that time. Higher elevation biotic zones would have been affected as well, although no figures are currently available beyond Pellatt's (1996) estimate of shifting zones some 300 meters in elevation above current levels.

This research emphasizes the highly variable nature of the Okanagan– Similkameen biogeoclimatic zone reduction into analytic periods tends to obscure. Extrapolating from

Heinrichs (1999) and Pellatt's (1996) data, it is evident that various vegetation patterns were characteristic of the Similkameen Valley from the earliest Holocene (9,500–10,000 BP). These ranged from sagebrush–steppe through open and closed canopy forests of Pine and Engelmann Spruce. As such, resources characteristic of each biogeoclimatic zone were available throughout the valley, but varied in abundance with latitude and elevation. This variation supported early highly mobile foragers and later forager–collector subsistence strategies of indigenous populations from ca. 10,000 BP to the historic period. Hebda's (1999) statement that the Cathedral Lakes area was most likely a glacial refugium has implications for current and future archaeological research, as does evidence for a rapid cooling and increase in moisture ca. 4,000–5,000 BP.

North–central Columbia Plateau Palaeoenvironments

Chatters and Pokotylo (1998: 30–46) discussed palaeoenvironmental change for the Columbia Plateau in which the following broad patterns were defined:

Table 2.3: North–central Columbia Plateau Palaeoenvironments

9,000–7,500 BP:	warm and dry
9,500–6,400 BP:	increasing precipitation, except in the Okanagan Highlands and Columbia Basin where decreasing precipitation is noted.
6,500–4,500 BP:	cooling, with sharp increase in precipitation at 5,000–5,400 BP
4,500–2,800 BP:	increased cooling, especially at 4,100–4,500 BP, with flooding along the Columbia River
2,800 BP to modern:	increasingly modern regimes between 2,800–2,100 BP, but with dryer periods between 2,800–1,600 BP and again about 600 BP (AD 1400) in the Columbia Basin.

Chatters (1986: 60–65) study is more relevant to the Similkameen in that it summarized work conducted in the Wells Reservoir area adjacent to the Okanogan and Columbia Valleys. At least three, possibly four, widespread glacial advances have been recorded in that area over the last 10,000 years. The earliest advanced ca. 7,500 to 8,400 BP and is typified by Glacier Peak moraine data with Mazama tephra overlying moraine deposits in some areas. A second advance has been identified at a single location at Dome Peak. Trees dating ca. 4,700–4,900 BP had been sheared by advancing ice. Two Neoglacial episodes date ca. 2,000–3,500 BP and ca. 2,000–2,800 BP at Dome Peak and Mount Rainier. A final Neoglacial advance is dated from the 13^{th} Century AD to the late 19^{th} Century (Chatters 1986: 61). Chatters interpreted evidence for montane glacial ice build–up as representing evidence for cooler than modern conditions

7,500–8,500 BP, 2,600–3,500 BP, and 100–650 BP. He compared fluvial aggradation–degradation models for the upper Columbia River and Wells Reservoir areas and palynology records nearby (Chatters 1986: 61–64) and defined four stages:

1) Post–glacial warming developed from ca. 10,000 to as recently as 7,500 BP, punctuated by a short cooler interval at the end of this period. River valleys are postulated to have been primarily grasslands with sagebrush steppe at higher elevations;

2) From 7,900–4,700 BP conditions were more arid with rivers, lakes and ponds experiencing reduced run–off levels where smaller water sources dried up completely. Sagebrush steppe replaced valley grasslands and whatever forest cover existed at higher elevations;

3) Moist conditions returned ca. 4,700 BP, followed by a brief cooling period, then by warmer conditions. Increased precipitation led to rapid down cutting of rivers and a marked increase in flooding. Intervals at 3,600–3,300 BP and between 3,300– 2,400 BP showed sporadic increases in down cutting activity as well. Forests expanded down slope and glacial ice accumulated in the high Cascades ca. 2,600–3,500 BP during a 1,000–year cooling period. A final period of aggradation occurred ca. 2,000 BP; and

4) The period from ca. 650–100 BP was marked by fluctuations in moisture and temperature, but apparently not as severe as in previous periods. This contrasted with areas further south along the Columbia where drought conditions about 600 BP contributed to increased erosion and possible declines in salmonid populations (Chatters 1984: 46).

Canadian Similkameen Palaeoenvironments

In terms of the modern environment for the Similkameen Valley, the early Holocene thermal maximum would have had varying effects depending upon the north to south gradient. Major effects would have been seen from the Princeton Basin south, where temperature and precipitation changes most likely pushed the ESSF zone ca. 100 meters higher in elevation than present. Replacing the ESSF zone in these areas was Interior Douglas Fir (IDF) and/or Montane Spruce (MS) and Ponderosa Pine (PP) with Bunchgrass (BG) zones such as currently seen in valley bottom lands. Smaller vertical ecozonal changes would have occurred in the Upper Similkameen Valley west of the Princeton Basin, given its higher precipitation ranges as an effect of the Cascade Range. Forest zone replacements of about 100 meters elevation would have meant that southern portions of the Similkameen Valley between 3,500–7,000 BP resembled the modern valley, but with a greater expanse of xeric grassland and Ponderosa Pine– Bunchgrass habitats than exist at present.

When one considers the macro– and micro–ecological ecoregional variation in mountainous areas such as the Similkameen Valley, it is hypothesized that post–glacial palaeoenvironmental changes impacted Aboriginal populations exploiting resources across the altitudinally–zoned microenvironments along the eastern flanks of the Cascade Mountains in the Similkameen and Tulameen Valleys. Ungulate populations such as deer and elk may have been driven further north and west into upland areas during the thermal maximum, but bighorn sheep would have expanded north, following the development of montane grassy slopes and meadows and a generally open canopy forest. Post–7,000 BP would have adapted to more mesic forest and grassland, subject to later Neoglacial climatic shifts. Post–7,000 BP populations would have adapted to more mesic forested and grassland, subject to later Neoglacial climatic shifts.

Similkameen Biodiversity

Tables 2.4 and 2.5 (as well as Figure 2.14) list contemporary species biodiversity across five ecozones in the Similkameen and Tulameen River drainage systems. Table 2.5 lists faunal species that ethnographic records indicate were most important for traditional Similkameen First Nations' economies. Table 2.6 lists avifauna species most commonly procured ethnographically for consumption and medicinal requirements. Many floral species were collected for raw materials used for tools, structural feature components, textile fibers for matting, cordage and the like. Table 2.7 lists fish species of importance today in Similkameen First Nations' diets. These data are primarily drawn from Bouchard and Kennedy (1984), Cline et al. (1938), Parish et al. (1996), Stevens (1995), Teit (1930), Turner (1978,1998), and Turner et al. (1980).

Table 2.3 indicates that large, medium and small mammals are consistently found throughout the five ecological zones in the Similkameen Valley. Vertical zonation within the valley system assured pre–contact inhabitants seasonal access to all species simply by moving north, south, or upslope.

Table 2.4: Similkameen Biodiversity (Number of Species)

Ecozone	Mammals	Birds	Total
BG	55	260	331
PP	59	271	347
IDF	69	302	389
MS	65	178	243
ESSF	68	126	203
AT	36	88	125

Key:

BG Bunchgrass zone
PP Ponderosa Pine
IDF Interior Douglas Fir
MS Montane Spruce
ESSF Engelmann Spruce–Subalpine Fir
AT Alpine Tundra

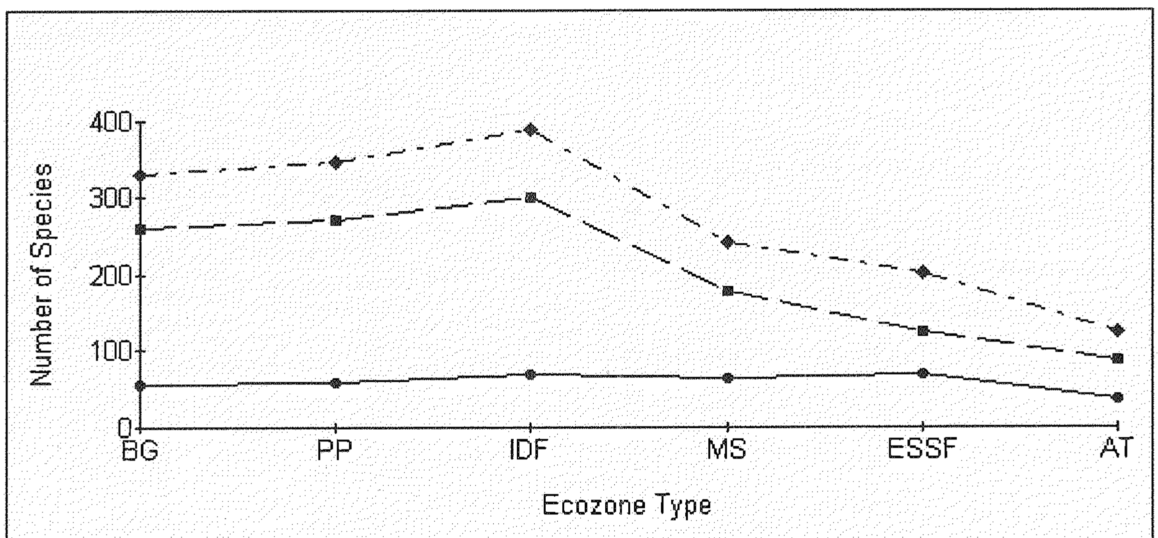

Figure 2.14: Similkameen Biodiversity (from Table 2.3)

Key:

BG Bunchgrass zone
PP Ponderosa Pine
IDF Interior Douglas Fir
MS Montane Spruce
ESSF Engelmann Spruce–Subalpine Fir
AT Alpine Tundra

Similkameen Faunal Resources

A number of wildlife species occupy the Similkameen Valley system. Populations vary from north to south, following ecozonal, micro–environmental and physiographic variability from the colder, wetter, more rugged Tulameen and Upper Similkameen through to the warmer, dryer Lower Similkameen areas. Faunal indicators of a more Sonoran bioclimate such as the Northern Pacific rattlesnake (*Crotalus viridus*) occur upstream to an area 12 to 20 kilometers south of the confluence of the Similkameen and Tulameen Rivers. Historical land–based faunal resources included mountain (bighorn) sheep, mule deer, white–tail deer, mountain goat, black and grizzly bear, cougar, bobcat, lynx, coyote, beaver, squirrel, ground squirrel, skunk, porcupine, hoary and yellow bellied marmot, inhabiting various micro–environments throughout the main Similkameen and tributary valleys and upland areas (Bouchard and Kennedy 1984; Stevens 1995; Teit 1930), see Table 2.5 (Appendix C).

Elk (wapiti) have become rare due to lack of forage since forests have not burned in the 10 to 20–year fire cycle required to generate suitable microenvironments for these animals. Moose appear to be early to late 20th century migrants to the area (Stevens 1995). Modern populations of Mountain goat and Bighorn sheep populations are small and generally limited to highland areas of the Ashnola River drainage although they have been seen as far north as Hedley Creek (Chief R. Holmes, personal communication 2000). Mule and white tail deer are ubiquitous throughout the valley system. Black and brown (grizzly) bear are present with black bears predominating, especially at lower elevations where they most often come into conflict with the current valley human population. Grizzlies tend to be more solitary, preferring upland slopes beyond the sphere of most human activities except mining, logging and recreational activities.

With the exception of Mule and White tail deer, the majority of important ungulate species are found most frequently in open to closed canopy hillside to montane forest locations. Although contemporary hunting figures for White tail deer are not available, Harper (1984) records 900 to 1,200 Mule deer taken on a yearly basis from 1992–1996. This contrasts with 1,100 to 2,200 kills in the Okanagan over the same time period. If modern populations of deer are in any way representative of pre–contact ungulate populations, then the primary importance of Mule deer for food, as indicated in the ethnographic literature, is supported. Moose should be discounted from the pre– contact period, being 20th century migrants to the area (Stevens 1995).

Palaeoenvironmental data indicating floral zonation shifts of up to 100 meters in elevation during dry and moist cycles would have had the most impact on faunal communities inhabiting the two lower bioecological zones – the Bunchgrass and the Ponderosa Pine zones, especially in the southern valley where conditions are more xeric. During the early to mid–Holocene, these zones would have experienced a decline in large mammal biomass, with reduced deer populations resulting from reduced forage. Further north, the effects of aridity would have been less pronounced, with less effect on deer populations, especially White tail prefer to browse on gallery growth along rivers and streams. However, even in the dryer southern valley, deer populations would have moved upslope where possible. Similarly, herds of bighorn sheep, which are now restricted to the Dry Interior Zone in southern parts of the valley, would have had range extensions in northern valley sections as closed canopy forests opened and retreated upslope.

Bighorn sheep may be used as an example of one adaptive trend during the mid–Holocene. Dyer (1998), Harper (1984), as well as Lawson and Johnson (1982) summarize information about *Ovis canadensis* populations pertinent to past and extant Similkameen herds. Bighorn sheep are gregarious, live in bands of 5 to 15 ewes per mature ram and require semi–open, steep terrain with rocky slopes, ridges and cliffs. Bighorn sheep tend not to range widely. They prefer to occupy approximately 10 percent of available winter range in season. Wild sheep migrate but tend to follow established routes. They can travel between 3.5 to 16 kilometers per day depending upon terrain. Winter ranges are often found at elevations of less than 1,000 meters ASL and are associated with south to southwestern exposures. Spring habitats are similar, with movements towards green vegetation along stream and valley corridors. Summer sees herds in open meadows with south to southwestern exposures (Harper 1984). Throughout the year herds tend to remain within relatively constrained areas of less than 1 to about 3 kilometers. Their relatively restricted ranges make them vulnerable to predation during all seasons, but they are more easily hunted in the fall and winter when their movements are more constrained as indicated in the ethnographic range (Teit 1930).

These preferred habitats were exploited by historic and pre–contact hunting parties due to the animals' predictable patterns. Hunting was accomplished by solitary stalking, or coordinated drives in winter or fall (Teit 1930). It is suggested that coordinated drives would have been more successful in the past due to their keen visual acuity that makes it difficult for a lone hunter not equipped with a firearm to approach within an effective killing distance without being seen. Although modern herds are restricted to the Ashnola River watershed south into the Cascade Range with rare sightings north to Hedley Creek, mid–Holocene elevated temperatures would have extended their range as far north as the Princeton Basin. Habitat for some species would have been compensated by an increase in other species' habitat, the result of the short horizontal and vertical distances involved.

Similkameen Avian Resources

Avian species present in the valley occur primarily from the Interior Douglas Fir zone down slope to the Bunchgrass zones, especially in wetland areas. Ethnographically important species procured on a regular or seasonal basis included Canada geese, mallard, pintail, blue–winged teal, green–winged teal, redhead, coots and mergansers, as well as several species of grouse. Waterfowl and game bird populations today, as in the past, tend to be concentrated among larger valley lakes within Bunchgrass to Ponderosa Pine zones (Table 2.6, Appendix C). Small flocks and isolated birds can be found in upland (Interior Douglas Fir, Montane Spruce and Engelmann Spruce–Subalpine Fir) zone pothole lakes (tarns), marsh and beaver pond environs. Raptors include the bald–headed and golden eagle, marsh hawk, red–tailed hawk, osprey and great horned owl among others (Robbins et al. 1966; Stevens 1995). Chapter 3 (Ethnography) discusses traditional uses of avifauna.

Economically important avifauna can be found in all five ecozones although migratory species are associated with open water sources ranging from lowland to upland lakes and ponds. Most are available seasonally, with only the Canada goose, mallard and common loon available year–round in the Dry Interior Zone, especially in the Bunchgrass and Ponderosa Pine belts.

Cline et al. (1938) provided ethnohistoric accounts that song and other birds were eaten on an opportunistic basis among the Sinkaietk, indicating that a similar situation probably existed among the Similkameen. Reduced stream and river run–off during the mid–Holocene would have had more of an impact of avifauna habitat in the dryer southern regions of the valley south of Keremeos. Here the valley widens and the Similkameen river begins to meander, creating marshland environments which contribute to the large numbers of waterfowl currently inhabiting the area. Reduced run–off may have led to a drying out of many of these marshlands.

Reduced run–off would not have created additional marshy areas upstream, as the river takes the classic form of an underfit stream lying within a main channel cut during the early Holocene. Tributary lakes and watersheds (Keremeos Creek, Ashnola River, the Wolf Creek watershed, the Tulameen, Otter and Summers Creek areas) as well as upland ponds, lakes and marshes would have still attracted avifauna even during the early Holocene drying trend. It is doubtful that avifauna biomass reductions would have had a great impact, except to shift predation activities north into the valley and upslope areas.

Similkameen Fish Resources

Near its confluence with the Okanogan River in the United States, the Similkameen River possesses: anadromous salmon with Steelhead, Kokanee and Rainbow trout, Dolly Varden char, Mountain whitefish, sculpins, freshwater Ling (burbot) and several species of minnows (shiners, squawfish, chiselmouth and dace). With the exception of anadromous salmon, Kokanee and burbot, all species are available in the Canadian portion of the Similkameen River. Although salmon have been caught near the mouth of the Columbia for over 9,000 years (Butler and O'Connor 2004), it is unclear what impact fossil salmonids dating 15,000–18,000 BP in Kamloops Lake (Carlson and Klein 1996) will have concerning early Plateau human populations.

Freshwater mussels of at least two species (*Margaritifera falcata* and *Gonidea angulata*) are present (Kennedy and Bouchard 1986). Reduced surface water during the early to mid–Holocene would have affected fish and freshwater mussel populations, although the scale of such impacts has yet to be studied.

Table 2.7: Anadromous and Freshwater Fish of Importance

Anadromous and Freshwater Fish:	**BG**	**PP**	**IDF**	**MS**	**ESSF**
Coho salmon (*Oncorhynchus kisutch*)	sA	sA			
Spring salmon (*Oncorhynchus tshawytscha*) *	sA	sA			
Sockeye salmon (*Oncorhynchus nerkwa*) *	A	A			
Kokanee salmon (*Oncorhynchus nerka*)	A	A			
Steelhead trout (*Salmo sp.*) *	ySA	ySA			
Brook trout (*Salvelinus fontinalis*) *	yY	yY	y	?	?
Rainbow trout (*Salmo gairdneri*) *	yY	yY	y	?	?
Dolly Varden char (*Salvelinus malma*)	yY	yY	y	?	?
Largescale sucker (*Catostmus macrocheilus*) *	yY	yY	y	y	?
Bridgelip sucker (*Catostmus columbus*) *	yY	yY	y	y	?
Northern mountain sucker (*Catostmus platyrhyncus*) *	yY	yY	y	y	?
Burbot, "lingfish" (*Lota lota*) *	yY	yY			
Mountain whitefish (*Prosopium williamsoni*) *	Y	Y	y	?	?
Peamouth (*Mylocheilus sp.*) *	yY	yY			
Mountain squawfish (*Prosopium sp.*)	yY	yY	y	?	?
Northern squawfish (*Ptychocheilus sp.*) *	yY	yY	y	?	?
Redside shiner (*Richardsonius balteatus*)	yY	yY			
Longnose dace (*Rhinichthys cataractae*)	yY	yY			
Leopard dace (*Rhinichthys falcatus*)	yY	yY			
Torrent sculpin (*Cottus rhotheus*)	yY	yY			
Mottled sculpin (*Cottus bairdi*)	yY	yY			
Black catfish (*Ameiurus melas*)	yY	yY			
Freshwater Mussels:					
Freshwater mussel (*Margaritifera margaritifera*) *	yY	Y	y	?	?
Freshwater mussel (*Gonidea angulata*)	yY	y	y	?	?

Anadromous salmonids were probably lacking throughout much, or all, of the later Holocene to pre–contact periods in the Canadian portion of the Similkameen River due to a natural falls downstream of Shanker's Bend in the United States. This is now the site of Enloe dam, constructed in AD 1920 (Fanning 1985; Mitchell 1980). Salo (1987) however, observing higher concentrations of mid–Holocene occupations at Palmer Lake, hypothesized that only a return to wetter conditions and increased run–off by later Holocene times induced sufficient down cutting of sediments to produce Squantlen Falls and thus restrict anadromous species from upriver sections of the valley. No evidence of early to mid– Holocene salmonids have been found in cultural deposits upstream of the falls (other than the early sample at Kamloops Lake), but the sample of excavated archaeological sites is small, so the question of early salmonids in the Similkameen River remains ambiguous.

The pre–1920 Squantlen ("Lower" Similkameen) Falls are estimated at 7.6 to 9.1 meters in height with a 335 meter–wide by 4.0 meter–deep upstream pond (Mitchell 1980). Squantlen Falls has been obliterated by dam construction, but a height of 7.6 to 9.1 meters deduced from a 1904 photograph of the falls led Mitchell (1980) to conclude that salmon could not have migrated past the falls. This is in general agreement with statements collected from Similkameen elders that the Canadian Similkameen River was lacking in salmonid resources (Bouchard and Kennedy 1984, Hudson 1994 and Salo 1987). Table 2.6 indicates that a majority of fish habitats in the Similkameen fall within the Bunchgrass and Ponderosa Pine zones in rivers, streams, and lakes (Coad 1995), although some species are found at higher elevations in lakes and streams.

Since anadromous fish were historically lacking within Canadian Similkameen territory, the predominant species taken were trout, especially Rainbows found in tributary streams (Johnson 1994) and upland lakes. Northern squawfish share this distribution. Mountain whitefish are found throughout the Similkameen River as well as in the two largest lakes, Wolf and Otter (Johnson 1994) and tributary streams. Suckers (Largescale and Bridgelip) and minnows (Redside shiner, Longnose and Leopard dace and Chiselmouth) share a similar distribution. Both sculpins (Torrent and Mottled) are found only in the main Similkameen and Tulameen Rivers and in the lower reaches of tributary streams.

A.C. Anderson's 1846 journal (cited in Hudson 1996) indicated that whitefish were taken using a weir north of Otter Lake. Hudson (1996) indicated that similar weirs were found near the mouths of major tributary streams flowing into the Similkameen and Tulameen Rivers. Peamouth ("Chiselmouth") can be found throughout larger streams and lakes extending into the Interior Douglas Fir zone locally (Johnson 1994). Up to 23 cm in length, Peamouth were harvested, dried and stored for winter use. Suckerfish often attain "pan–size" and were obtained historically in considerable numbers. They prefer faster stream environments and can be found at elevations as high as 2350 meters ASL (Coad 1995), well within the Engelmann Spruce–Subalpine Fir zone.

A 1994 survey of fish species within the Similkameen and Tulameen drainages indicates that the most widely distributed (Johnson 1994: 9–10, table 3) and thus most economically valuable freshwater fish were Rainbow trout and Mountain whitefish. Rainbow trout were found in 32 of 47 area streams. Mountain whitefish were found in 4 of 47 streams, although with Rainbow trout they also are present in the larger Similkameen lakes. The 1994 survey took place in late July through August and did not sample above 1500 meters ASL (Johnson 1994). Several streams were blocked by natural falls or similar barriers and samples were taken during the lowest water levels of the year. Caution in applying the 1994 data to the past should be noted, since many fish habitats have been damaged by 19th and 20th century land and stream alterations. If anything, the pre–contact distribution of freshwater fish species in waters of the Similkameen and Tulameen drainage systems was probably greater than at present especially given the 20th century disruption to natural fire cycles.

Two species of freshwater mussel also can be found within Similkameen drainages. *Margaritifera falcata* is the most common, preferring quick flowing streams or slightly silted lake margins. *Gonidea angulata* prefers slower moving waters which with thicker accumulations of sediments. Both species can be observed as far north as Wolf Lake south of Princeton. It is not known if they persist into the Tulameen drainage system.

Similkameen Floral Resources

A wide variety of floral resources can be found across the varied ecozones present in the Similkameen and Tulameen Valleys. Edible and medicinal plants include lichens, mushrooms, berries, and tubers, plus the seeds and cambium of a number of tree species. Some tree saps exhibit medicinal properties, as do some berries and tubers. Floral species known to have been exploited by the Similkameen and/or related Interior Plateau First Nations groups (Bouchard and Kennedy 1984; Cline et al. 1938; Parish et al. 1996; Teit 1930; Turner 1978,1998; and Turner et al. 1980,1990) are indicated in Table 2.8 (Appendix C).

As with faunal communities, the impacts of the mid–Holocene xeric maxima would have resulted in a decline of edible plant biomass most in the dryer southern portions of the valley. More mesic northern valley conditions would have ameliorated xeric trends, with some species surviving in the south by displacement upslope with grasses and grassland–steppe communities.

Lithic Resources

Additional resources include a number of cryptocrystalline silicates and dacites (grades of basalt) that can be found as vein outcroppings throughout the Hozameen and Okanagan Ranges. Quartz crystal is rare, but occurs in both the Cascade and Okanagan Ranges. Very few lithic sources have been identified in the valley, but one source of "Allenby chert" is known near Princeton (Vivian 1989a), a quarry of vein cherts is known from Amalgamator Mountain near Hedley, as are outcroppings of dacites in the Whistle and Smith Creek drainages west of Hedley (Gould 2001). A well–known source of red and yellow ochre (haematite or iron oxide) can be found on the Tulameen River some four kilometers upstream of Princeton. Additional sources of red ochre have been observed in various localities throughout the Princeton Basin.

Chapter Summary

This chapter provided an overview of the Similkameen Valley montane–riverine system located between the Fraser and Columbia Plateaus. Although close to the Thompson–Fraser region of British Columbia, it exhibits ecological transition zones southward towards the United States. The northern portion of the valley is mainly characterized by Montane Spruce and Engelmann Spruce–Subalpine Fir zones that grade to Alpine ecozones on the Tulameen Plateau, as well as on the flanking Okanagan and Cascade Ranges. However, this changes to drier Interior Douglas Fir to Ponderosa Pine–Bunchgrass zones on lower valley flanks and bottom lands, especially south of the Princeton Basin to the 49th Parallel. Valley bottomlands become increasingly xeric south of the Princeton Basin, especially in the southern Canadian Valley from Keremeos to the Border.

Bioecological resources from post–glacial to modern times varied with elevation, but most resources would have been available to pedestrian hunter–gatherers at no more than two or three days travel from valley bottoms. Palaeoenvironmental data from areas north and south of the study area indicate climatic changes over time, especially prior to 4,500 BP when modern ecological zones had shifted as much as 100 meters upslope during the warmer, drier xerothermic. Regardless, it is probable that the majority of floral and faunal resources available ethnohistorically were also present in the valley by at least 8,000 to 10,000 BP although numbers most likely fluctuated depending upon climate. As such, it is highly unlikely that the Similkameen Valley was not occupied, or at least visited on a seasonal basis, by these times.

This data suggests early human occupation and use of the valley from early Holocene times and provides a context by which land–use can be modeled (Chapter 4). Of interest is the lack of salmonid resources in the Canadian Similkameen Valley due to the height of Squantlen

Falls in Washington State. However, since little is known about the southern Canadian Similkameen, the nature and significance of salmonids in the valley awaits further study. It is unlikely that anadromous salmonids contributed much to pre–contact population subsistence strategies in the Canadian valley as research to date has failed to reveal their presence. While this lack of data could be due to sampling error, the absence of anadromous salmonids remains is not necessarily evidence of their total absence from the valley since only a small sample of sites has been investigated and only one of those is a probable winter occupation (DiRa–20) (Appendix A). As is the case with so many archaeological projects more fieldwork is required before our understanding of human–ecological relationships can be better understood.

– CHAPTER 3 –

PLATEAU ETHNOGRAPHY

The Thompson and Columbia Plateau Plateaus are bisected into two ethno–linguistically defined culture zones (Figure 3.1):

1) a northern area inhabited by Interior Salish–speaking peoples occupying both the Thompson and northern portions of the Columbia Plateau, and
2) a southern area of the Columbia Plateau occupied by Penutian–Sahaptin speakers (Ray 1939: 2, map 1).

The largest Salishan language group is the Okanagan–Colville (Nsilxcin or "people's speech") (Kennedy and Bouchard 1998: 1). The term is used regardless of location in Canada and the United States. The latter includes the modern Okanagan–Colville ethnic polity of Washington State.

The Interior Salish language group includes the:

1) Northern Okanagan (Okanagan Lake and River drainages);
2) Similkameen Okanagan (Similkameen River drainage) including the ethnohistoric Similkameen–Athapaskan Stewix, or Stuwix (Figure 3.1);
3) Southern Okanogan, "Sinkaietk" (Okanogan River, Washington State);
4) Methow (Methow River drainage);
5) Sanpoil–Nespelem (Columbia River from Grand Coulee to Rogers Bar and along the Sanpoil and lower Spokane Rivers); Colville (Columbia River from Northport south to Rogers Bar and in the Colville Valley); and
7) Lakes, or Senijextee – on the Columbia River from Northport to Revelstoke, including Arrow and Slocan Lakes (cf. Kennedy and Bouchard 1998: 1–2; Ruby and Brown 1992).

An eighth language group was the Sinkiuse who inhabited an area east of the Methow as far south as the 47th Parallel (Miller 1998: 269; Ruby and Brown 1992: 204).

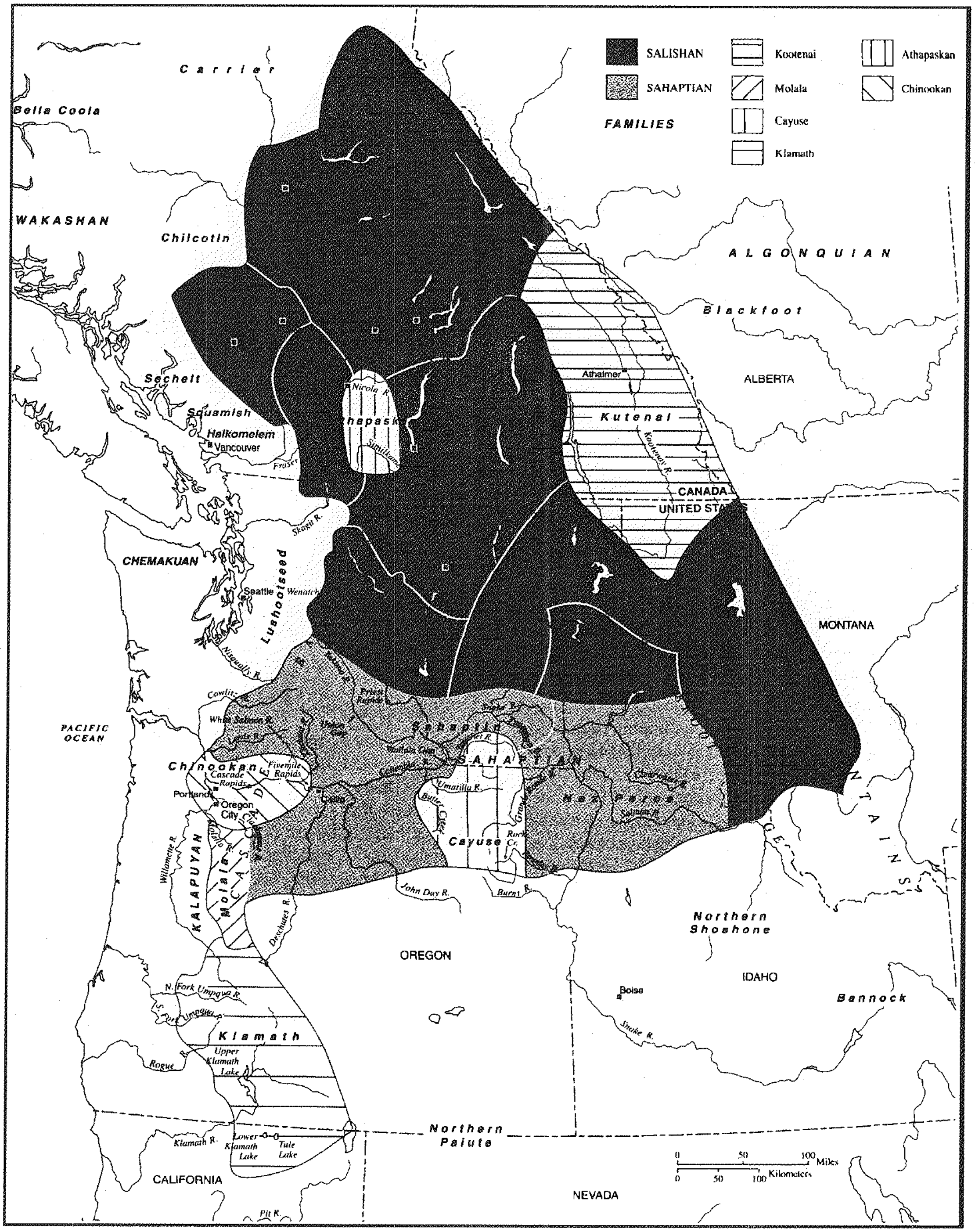

Figure 3.1: Plateau Ethno–linguistic Groups.

(after Kinkade et al.1998: 50)
Note: Similkameen (Stewix) and Nicola Athapaskans

The Ktunaxa (Kutenai) of the Rocky Mountain trench inhabit the extreme eastern periphery and are considered to lie outside of this area of study, as are Siouian (Blackfoot) populations who inhabited peripheral eastern areas, seen as a result of proto– historic and historic population movements (Brunton 1998: 224; Ray 1932, 1939). Another linguistic isolate was an Athapaskan–speaking group that became extinct in the Nicola and Similkameen Valleys by the mid–19th century AD (Kennedy and Bouchard 1998; Teit 1900, 1930; Wyatt 1998: 220).

All groups living in the United States, but particularly the southern Okanogan (Sinkaietk) and Sanpoil–Nespelem, form the nucleus of the modern Colville Confederated Tribes. Related eastern groups of Salishan speakers such as the Kalispel (Pend d'Oreille) and Coeur d'Alene are also included, as are the Ktunaxa and the Sahaptin–speaking Nez Perce and Palouse of the southern Columbia Plateau (Brunton 1998: 224–226; Ruby and Brown 1992: 42). These Okanagan–Colville sub–groups form the ethnohistoric nucleus of peoples whose ancestors most likely left the pre–contact archaeological record in the Southern Fraser and Northern Columbia Plateau regions.

These ethnographic Plateau divisions have been widely accepted by archaeologists working on both sides of the international border. Some have been sub–divided into archaeological and ethnographic sub–areas. The Okanagan valley north of the 49th Parallel is distinguished from and the American Okanagan (variant: "Okanogan", "Okanagon") valley south of the Canada–United States border (Cline et al. 1938; Hudson 1986, 1995; Kennedy and Bouchard 1998; Ray 1939; Ruby and Brown 1992; Teit 1930; Willey and Phillips 1958). This dichotomy is more a reflection of 19th and 20th century political realities than pre–contact Aboriginal socio–political systems. As such, the 49th parallel is a modern barrier to analysis and impedes the free flow of archaeological and anthropological information – an unfortunate situation for scholars and Aboriginal peoples on both sides of the border. Geographically, the northern border of the Thompson Plateau transitions from montane forests and grasslands to spruce forest ecological systems north of Kamloops (Cannings and Cannings 1996: 92, map 16; Prentice and Kuijt 2004; Walker 1998:1–3).

Ethnographic Plateau Cultures: The Seasonal Round

A generalized overview of the Plateau ethnographic seasonal round can be summarized as follows. Sources consulted for the following include: Bouchard and Kennedy (1975, 1984); Carl et al. (1959); Chance and Chance (1982, 1985); Cline et al. (1938); Fanning (1985); Grabert (1970,1984); Greengo (1986); Hudson (1986,1990, 1994,1995,1996); Kennedy and Bouchard

(1998); Lerman (1954); Ray (1932,1939); Salo (1987); Swanson (1962); Teit (1900,1930); Turnbull (1977); Turner (1978,1979); Turner et al. (1980), and Vivian (1992). This information is important for the understanding of the proto–historic and ethno–historic periods of the Similkameen culture history (see Chapter 5), as well as for elucidating variables for archaeological site predictive modeling (see Chapter 4).

A significant disparity concerning the lack of anadromous salmon within the Similkameen watershed north of Enloe (Squantlen) Falls, discussed previously, indicates the following generalized description of Plateau patterns may require adjustment especially with respect to winter village aggregate communities that, although known to have existed, are few. It is suggested that the major winter village area for the entire valley once existed near Palmer Lake and/or the confluence of the Similkameen and Okanagan Rivers, areas closer to the presumed major fishing stations where winter stores could be processed and curated. The lack of larger winter village aggregate communities, as opposed to individual pithouses or clusters of three or four houses per site, strongly suggests that Similkameen populations over–wintering north of the 49^{th} parallel retained earlier Plateau foraging with limited storage subsistence strategies characterized by Columbia Plateau sites dating ca. 4,400–6,000 BP (cf. Ames and Maschner 1999; Chatters 1989), characteristic of times when salmon were dietary supplements as opposed to a staple food resource.

Winter: The central base of the late pre–contact and protohistoric settlement network was thought to have been the winter village, occupied from mid–October to spring thaw. The primary dwelling was the semi–subterranean pithouse or mat lodge (Figure 3.2).

Although not as robust as the pithouse, conical or A–frame shaped superstructures of woven tule mats set over a shallow excavated depression may have been preferred by more mobile foraging populations over the more permanent pithouse structures. For that segment of the population who may have had to stay mobile during winter through choice or circumstances, a collapsible and portable or simply more expedient mat lodge structure may have been a fundamental requirement for survival. It is this structure that forms many Similkameen pithouse sites as only two examples of larger, deeper varieties are known. Both of the latter are found as isolated instances mid–valley, north of Hedley. Large, presumably multi–family, A–frame mat lodges were observed on the Columbia at Priest Rapids as recently as AD 1952 (Strong 1959: 93). Smaller conical structures resembling a hide–covered tipi would appear to have been used in less sedentary situations by individuals or family units.

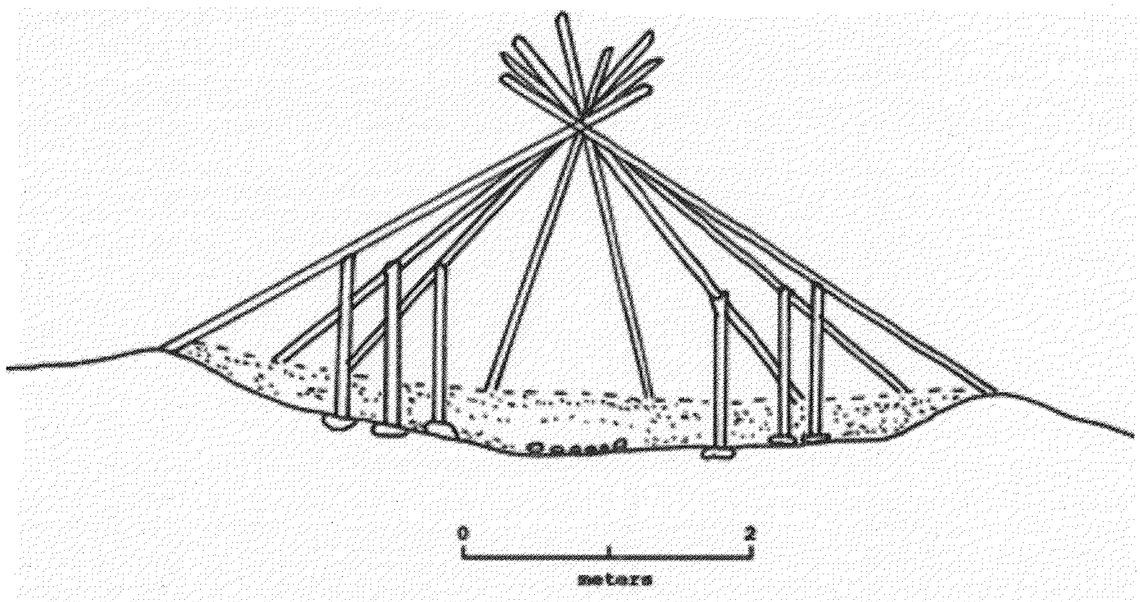

Figure 3.2: Mat–covered Pithouse Framework

(after Chance and Chance 1977: 57, figure 27b)

It is probable that some mat lodge structures were occupied in winter and other seasons when, for reasons of weather, security, or as storage facilities, such structures would have been considered of value. Stored foods (meat, roots, berries, fish) were kept in the village in dwelling structures or in above or below ground caches. The winter months were passed engaged in pursuits such as hunting, maintenance of stores and equipment and social visits to other villages.

Spring: After spring thaw those families who had over–wintered abandoned the village in favour of spring camps, which were often established nearby. Spring hunting was the dominant subsistence activity combined, or supplemented with, procurement of early floral resources, fishing in creeks and streams, freshwater mussel gathering and trapping small game.

Summer: The summer months saw the splitting of the community into various family–based resource procurement camps. These included hunting expeditions, lithic resource extraction, camps established to facilitate berrying and root digging, fishing and preparation of fish camps. Fishing consisted of the pursuit of suckers, minnows, trout and whitefish where available, often in upland lakes. In late summer, the first runs of anadromous species (salmon and steelhead) appeared, but only south of the International Border. Eels and sturgeon were taken only in the Columbia River drainage (Bouchard and Kennedy 1975).

Autumn: During early autumn the historic pattern had people disbanding from larger fishing camps (salmonids in the United States, trout in rivers and upland Canadian lakes) and pursuing a number of family–based subsistence–related activities. Some ventured in search of late salmon in the south, whereas others traveled into the higher elevations of the Cascade Range (Okanogan and Hozameen Ranges) in search of berries, autumn roots and to hunt elk, deer, Bighorn sheep and marmots. Movement back to the winter villages, for those who preferred them, began about mid–October, when houses were cleaned and foods properly stored. Some people may have preferred to stay in smaller villages of one to four houses or remained in camp situations throughout the winter without benefit of semi–permanent structures.

Non–winter, smaller social aggregate communities were characterized by geographic mobility. Spring and summer saw the winter macro–bands with populations of several hundred in prime resource areas reduced to levels of 35 individuals or less – the classic band level population. Smaller logistical group sizes were necessary in order to more effectively exploit the available biomass of the landscape, especially when most of the Similkameen area lacked the seasonally available anadromous fish.

These groups would congregate in early spring after ice melt at upland lakes in order to capitalize on freshwater fish stocks. This is particularly evident in the ethnographic accounts of the Nicola and Upper Similkameen (Bouchard and Kennedy 1984; Hudson 1994, 1996). Mid– to late spring saw populations being further dispersed across the landscape, depending upon the availability of resources such as game of all sizes, berries and roots. Some groups focused on hunting through short–term or extended trips away from base (logistical/residential) camps. Others remained in proximity to base camps which were placed in order to maximize local resource potential. Local resources included prime hunting and gathering places, as well as other valued resources such as bark (for structural features), cambium (food) and firewood. Other strategic resources gathered included lithic raw material sources/quarries and, in the case of the Upper Similkameen, red ochre from the main quarry site (DiRd–35) on the Tulameen River. In areas of lower usable biomass, the band level was further reduced to individual family units – the micro–band. Small family groups would travel across several biogeoclimatic zones on a regular basis in order to procure food and other necessary commodities such as bark, fibre, animal products, lithics, red ochre and the like.

Social Correlates of the Seasonal Round

The historical Plateau seasonal round correlates with the band level of human social organization. Bands, consisting of small numbers of individuals linked through co–resident, bilateral affinal relationships are thought to have memberships numbered from less than 30 to over 100 individuals depending on season, resource availability, resource procurement task groups and preference. The ethnohistoric record points to a pattern of social aggregation in winter villages, with a more dispersed population in other seasons except for late summer and early autumn when larger numbers congregated at salmon or freshwater lake fishing stations and camps. Larger aggregate populations were capable of over–wintering together because supplies of dried salmon and other foods were sufficient to support them for several months. Evidence cited in Bouchard and Kennedy (1984), Cline et al. (1938), Hudson (1986, 1990, 1994, 1995, 1996), Kennedy and Bouchard (1998) as well as Teit (1930) indicates hunting was generally carried on throughout the winter. This was most likely due either a need to increase the larder or to provide diversity from a diet consisting primarily of dried salmon. Salmon availability depended upon fishing the American Similkameen, Columbia, Methow and Okanogan rivers, parts of the Nicola Valley or via trade with the Fraser or Skagit River areas.

Archaeological evidence of winter villages has been found in many areas, particularly in proximity to major sources of salmonid resources. These were the mid– Fraser/Thompson River region, areas of the North Okanagan close to Secwepemc and Nlaka'pamux territories, the Okanogan (particularly the recorded villages at the confluence of the Similkameen–Okanagan, as well as Okanagan–Columbia Rivers), Nicola and Douglas Lakes in the Nicola Valley, near the confluence of the Methow and Columbia Rivers and along the upper Columbia River. All point to higher probable use of these areas with proximity to salmonids, whereas the Similkameen Valley, at least during the Late Pre–contact period, may have been less utilized, capable of sustaining only more foraging–oriented resident populations who may or may not have been transhumant with regard to winter villages established near fishing areas.

Larger aggregate populations in the late pre–contact, protohistoric, and historical periods indicate the presence of the macro–band level of human social organization, at least in areas capable of sustaining them. Possible only due to stored food, increased levels of social stratification were associated with winter village sites. Ceremonial and political activities are historically documented, with the establishment, by historical times, of at least three social strata based upon evidence from the northern Columbia Plateau and mid–Fraser/Thompson River areas (Anastasio 1972; Hayden 1992; Hayden and Spafford 1993). An incipient political elite was comprised of individuals from better families. These families had established a form of kin–based corporate control over strategic resources such as the best fishing stations, root and berrying areas such as are present in Upper and Lower Similkameen contemporary Aboriginal communities (Chief Chief B. Allison, personal communication 1998; R.K. Dennis, personal communication 2000), but may have been lacking in most of the valley prior to the establishment of Eurocanadian–based economies.

Hayden (1992) in particular, views such control as contributing to the development of social stratification in the mid–Fraser/Thompson River area. His evidence for social stratification includes inequities in; a) size of pithouse dwellings, b) amounts and type of food refuse in and around dwellings, and c) number and type of non– subsistence artifacts such as artwork and related items. The presence of larger and better quality housing, foods, domestic fauna (dog) and *objets d'art* are strongly suggestive of social stratification. It is probable that some art objects, as well as the size and placement of pithouses within the larger community, are indicative of sumptuary symbolism with regard to economic and political power. To date, these types of evidence are lacking in the study area.

Although evidence for corporate control is generally scant for areas of the southern Fraser and northern Columbia Plateaus, possibly as a function of greater research in the mid–Fraser Thompson region, it was observed in certain areas. These were associated with salmonid fishing and storage technologies in key locations along the mid–Fraser, Thompson, Nicola, Okanogan/Okanagan, and lower to upper Columbia Rivers. Other significant areas associated with winter villages are the natural waterfalls/fishing stations at Okanagan Falls in British Columbia, as well as Enloe (Squantlen) and Kettle Falls in north–central and northwestern Washington, respectively. The Enloe Dam (Squantlen Falls) area south of the International Boundary should not be confused with the natural "Similkameen Falls" of the upper reaches of the Similkameen and downstream of its confluence with the Pasayten River.

The Impact of Epidemics

Ethnographically–recorded villages were occupied by small groups of a family or two. Larger aggregated communities existed near Princeton, Hedley, Keremeos and Chopaka. It is likely that earlier populations were larger, but site surveys indicate relatively small valley populations (Vivian 1992, Chapter 4 this thesis) regardless of the effect of pre– and post–contact epidemics. A number of epidemics have been documented for southern British Columbia and northern Washington. Smallpox epidemics are recorded across the Columbia Plateau as early as the 1770s (Jones 2003: 2), for the Arrow Lakes area ca. AD 1800 and in the Okanagan in AD 1832 (Teit 1930: 212), 1836 and 1857 (Campbell 1990: 21–27). Another epidemic swept most of British Columbia in the 1860s and an influenza epidemic in AD 1918 further reduced populations. The exact impact on the Similkameen needs further research as Campbell (1990: 186–193) questioned the use of post–epidemic data in models equating later pre–contact and historical cultures due to demographic and social impacts of protohistoric population declines. In 1865, Charles Wilson (1895: 292) estimated the Similkameen population as 300. In 1977, the Upper Similkameen Band had a registered population of 29, and the Lower Similkameen Band numbered 197.

Although pre– and post–contact burials were excavated in the valley as recently as the mid–20th century, none have been archaeologically recovered until recently (Copp 2006). In addition, only one site in the larger aggregate areas (DiRa–20) has been tested. As such, statements concerning the impact of epidemics or the nature of pre–contact aggregate population (village) sites require more fieldwork.

Traditional Similkameen Resource Management

Glen Douglas (Okanagan–Similkameen resident elder and cultural heritage advisor) indicated that the Tulameen red ochre quarry site was not easily accessible by non–Similkameen people. He suggested areas from Stirling Creek downstream were bottlenecks for traders who were restrained from venturing further north up the valley (W. Barlee, personal communication 1974; G. Douglas, personal communication 1995). This oral tradition indicates resident Similkameen control over access to this valuable natural resource, but does not provide information whether the control was kin–based *in usufruct* (control by corporate groups, not personal ownership). The Aboriginal name for this area is Sxwalhani.t ("soapberries"). Soapberries *(Shepherdia canadensis)*, also commonly referred to as "Indian Ice–cream" or "froth berries", were used to make a dessert by whipping the bitter–tasting berries into froth (Turner 1978: 139). Berries ripen from May to August depending upon altitude and served as a major item of trade among native peoples of the Interior.

Turner (1978: 26–27) reported Thompson (Nlaka'pamux) berry grounds held *in usufruct* for the community by specific families and/or individuals who controlled access to the resource. The Athapaskan term for land stewardship is *keyoh* (Dr. D. Hudson, personal communication 2000). A similar pattern was practiced among the Similkameen (Chief B. Allison, personal communication 1998; R.K. Dennis, personal communication 2000). During a site reconnaissance on the Alexis Indian Reserve (IR #9) north of Keremeos (Copp et al. 1995b) physical evidence of spring root–gathering activities on an upper terrace was recorded. This was identified as a traditional root–gathering area "belonging to" a specific Lower Similkameen family (H. Allison Jr., personal communication 1999).

Red ochre (ferrous oxide) was used in a wide variety of ritual and semi–ritual ways including personal body adornment, painting of tools, clothes and for the production of pictographs. A major, and many minor, sites are located in the Princeton basin. Many pictographs are associated in oral traditions with shamanistic activities, adolescent puberty rites, as trail markers, indications of sites with "power" as well as other probable interpretations (see Appendix E).

Glen Douglas (personal communication 1995) also mentioned Indian hemp cordage, deer hides, Bighorn sheep horns, eagle feathers and body parts and other valuable trade commodities controlled by the Similkameen. Identified lithic sources remain few, such as the Allenby Chert quarry west of Princeton and another quarry on Amalgamator Mountain north of Hedley, but both the Cascade (Hozameen) and Okanagan Ranges are known to bear various grades of dacites and cryptocrystalline silicates, as well as rare quartz crystal (Ray and Dawson 1987). Mineralogical analysis of dacites indicates usage from sources within the Cascade and Okanagan Ranges (Greenough et al. 2004).

Similkameen Ethnographic Culture

Although Teit (1930) was the primary 19^{th} century ethnographer to record information about the Similkameen Valley and its residents his attention was focused on adjacent ethnic groups; specifically the Nicola, Thompson (Nlaka'pamux) and Shuswap (Secwepemc) to the north and Okanagan to the east. Specific references to the Similkameen are embedded within these ethnographies, and particularly within accounts of the Okanagan. Most of this information presented is reported in Bouchard and Kennedy (1984); Hudson (1986, 1990, 1994, 1995, 1996); as well as Kennedy and Bouchard (1985, 1986, 1998).

Kinship Considerations. Informant information (G. Douglas, personal communication 1995) and historical marriage patterns indicate the existence of a network of kinship ties connecting members of the Okanagan–Similkameen, Nicola and adjacent communities. Extended families carried out basic economic activities and were primary units of production and consumption. Beyond the extended family were multiple connections through affinal and consanguinal ties traced from one's parents and grandparents in particular. A predominately bilateral kindred system included terms for lineal relations; parents, parents' siblings and their children, as well as collateral relatives in a multi–generational framework (Hudson 1986, 1990, 1995). Alternatively, Ackerman (1994) presents evidence for the Colville Confederated Tribes that nonunilinear (cognatic) descent groups occur in contemporary and possibly, ethnohistoric Plateau populations. She hypothesizes that non–unilinear descent groups, where they existed, were means by which some kin groups controlled access to resources (Ackerman 1994: 305). Her data support the evidence reported above concerning contemporary kin–based resource stewardship among the Similkameen.

The kindred provided security and protection. In neighbouring villages, one could usually find someone in one's kindred. There was another category of kin; descendants of a specific set of grandparents or great–grandparents were felt to have a special relationship to each other, as opposed to the relationship felt with the opposite set of grandparents (Hudson 1986: 49). This reflects the addition of a partial bifurcate– collateral kinship pattern to the basic system. Exemplified by Iroquois, Crow and Omaha patterns, parallel cousins are considered siblings and one or both sets of cross cousins may be considered marriage partners depending upon the relationship of the matriline and patriline. After marriage, women would normally reside with their husbands' kin group in the patrilocal residence pattern. Expanded kinship networks facilitated access to hunting, fishing and resource–procurement territories. This was an effective adaptive pattern geared towards survival based upon mutual reciprocity. Teit (1930: 270–275) recorded several important 19th century First Nations individuals in the Nicola– Similkameen and Okanagan Valleys whose parentage included Stewix, Salish, and Sahaptin linkages.

The pattern that emerges for the Okanagan–Similkameen is one of an autonomous patrilineal, patrilocal band structure with bilateral descent, to which aspects of a bifurcate–collateral kinship system were grafted. Exogamous marriages were considered the norm. Exogamy was a necessary adjunct for Similkameen forager–fishing communities in that widespread affinal ties would assist survival in times of economic deprivation by allowing consanguines, affines and fictive kin to reside within each other's recognized territories. Widespread exogamous affinal ties accommodated trade through mutual reciprocal relationships among the trading partners as was observed for Sahaptin groups on the Columbia Plateau (Anastasio 1972).

Kinship ties with Coastal groups might be illustrated by a story told by Similkameen elder Harry Robinson (Robinson and Wickwire 1992: 60–77) wherein a Plateau youth was sent into the Cascade Range for spiritual training. The youth was to winter alone and rejoin his kin the following spring, but chose not to. After several seasons alone, he met and married a young Coastal woman from the Puget Sound area who also had been seeking spirit power alone. Archaeological data indicating the use of highland areas for this type of activity is based on Reimer's (2000) location of non– subsistence sites in the eastern Cascade Range flanking the Similkameen. Other recent finds on the western Cascade flanks in North Cascades National Park by Mierendorf et al. (2006) suggest this as well.

Historical Similkameen Traditional Economy

Post–contact economic indicators Similkameen people were recorded in Palmer's 1859 account (cited in Allison 1976: 134, note 13:12):

> These were the first mounted Indians I had met with ... Agriculture, however, is but little known amongst them, and a few potato patches form the extent of their progress in this direction. They appear to live chiefly on fish, viz., trout and salmon, on game such as wild fowl, prairie chicken, and mountain sheep, and on wild berries, several kinds of which, including black and red cherries, abound in the neighbouring valleys ... I should mention that the "Similkameen" Indians are a portion of the Okanagan tribe, and speak the same language.

An overview of the resources available in the 1860s is indicated in the recollections of Allison (1976: 31):

> In those days we were well off during the summer – we could always send our pack–trains over the Hope Mountain for groceries or anything we needed. The Similkameen River and its tributaries gave us trout, Dolly Vardens and Greyling in abundance. We had heavy crops of Saskatoons, raspberries, strawberries, huckleberries, in their season. Wild roots and vegetables for those who knew how to gather them, and for those who desired them there was deer, bear, grouse, wild chicken and ptarmigan.

The types of plant foods available to a particular group varied depending on location. In general, most communities had access to bitterroot and a variety of berries. In the 1870s, Susan Allison moved to Keremeos and described her relations with the people there (Allison 1976: 39). Of note is her description of the importance of fishing "(t)he Indian women used to gather and dry Saskatoons, so I did the same and when they brought me trout which they caught by the hundreds in baskets they set in the One Mile Creek, I paid for them with butter and then dried and smoked the trout".

The importance of hunting is indicated in the following summary:

> The Okanagan country contained large and small game animals that were either hunted or trapped. Animals hunted included deer, elk, big–horn sheep, and bear. Smaller game included rabbits, marmot, and beaver. There were four great annual hunts: in spring, for deer and sheep; in late fall, for deer, sheep, elk, and bear; in mid–winter, for deer; and late in winter, for sheep. Noted hunters directed collective activities. Success in hunting was seen as the outcome of knowledge and adherence to proper ritual. For example, hunts might be preceded by purification in a sweat lodge (Hudson 1986: 450).

The Ashnola area was important for hunting, as indicated in an account by Teit (1930: 243–245) who described a hunting expedition one winter when the Ashnola people invited neighbouring Similkameen and others from the Thompson, Nicola, Okanagan and Columbia

Rivers. The Cascade Mountains and portions of the Okanagan Range were also hunting grounds for the Similkameen. Specific game included Bighorn sheep and Mountain goat (Robinson and Wickwire 1992: 232–233). Robinson and Wickwire (1992: 33–34) related a hunting story describing in detail rituals and techniques associated with deer hunting. The importance of hunting is also reflected in several pictographs of general hunting scenes or depicting deer being driven into a surround or corral (cf. Corner 1968: 59, 69). Some Similkameen trapped in addition to hunting. Susan Allison (1976: 33) described one trapper who arrived in March, 1870:

> About the middle of the month Cosotasket came from the mountains with a quantity of furs – my husband said he had at least five hundred dollars worth. Some he traded with him, the rest he hung in a tree till he felt like going to the Hudson's Bay Company post at Keremeos. Cosotasket said that year he only had a few martens as his favourite trapping ground at the Skagit was spoiled by fire ... Cosotasket that time lived mostly in the mountains and was known among the tribesmen as the Mountain Chief.

The traditional economy of the Similkameen people was concerned with hunting, gathering and fishing. Deer and Bighorn sheep were key resources. Again, the lack of salmon from the Similkameen system upstream of Squantlen Falls meant that freshwater fish (trout, whitefish, suckers and minnows), as well as freshwater mussels, formed important riverine and lake resources. Many upland lakes such as those in Wolfe Creek, Otter, Allison and Missezoula drainages had weirs built on connecting streams to capture migrating whitefish.

Similkameen Aggregate Communities

The Similkameen valley is the current homeland of the Similkameen people, members of the Okanagan–Colville language group of Interior Salish (Bouchard and Kennedy 1984; Kennedy and Bouchard 1998). The term *Similkameen*, or variants of it, is found in sources dating to AD 1811. An 1827 map (Figure 3.3) indicates that the Similkameen territory included the Similkameen River watershed northwest of the present town of Keremeos, south to the confluence with the Okanagan River in Washington State.

The Similkameen share common Plateau cultural patterns, although 20th century descriptions continue to combine the Okanagan and Similkameen polities (Bouchard and Kennedy (1984); Hudson (1986, 1990, 1994, 1995, 1996) and Kennedy and Bouchard (1998). Teit (1930: 204) noted three bands in the Similkameen Valley ca. AD 1900, with the possibility that there were additional groups in earlier times. However, on a 1904 trip to the Similkameen, Teit (1930: 205–206) listed 18 small villages in the valley from the Tulameen in the north to the confluence of the Similkameen and Okanogan rivers in Washington State (Kennedy and Bouchard 1998: 240–241).

Similkameen Demographic Data

Ethnohistoric Similkameen demographic information can be illustrated by an iteration of village locations and (limited) epidemic considerations:

Upper Similkameen Villages.

Campement des Femmes (Womens' Camp). In June 1846, A.C. Anderson recorded two large camps near Otter Lake. Anderson, a Hudson's Bay Company officer, had journeyed overland from Fort Hope to a point near the south end of Otter Lake where he encountered a local headman named "Blackeye" (or "Blackeyes", the Similkameen) (Anderson 1846). Blackeye informed Anderson of a trail leading north along the east side of Otter Lake which would take him past his (Blackeye's) camp north to the Nicola Valley and from there he could journey to Fort Hope on the Fraser River. He also informed Anderson of a trail, now known variously as "Blackeye's," the "Hudson's Bay Horse Brigade" or "Collin's Gulch Recreation" trail (see Copp 1998b for details). This trail led from a location on the north bank of the Tulameen River a few kilometers south of Otter Lake west across the Cascade Range to Fort Hope. The point on the north side of the river was referred to as Campement des Femmes (Womens' Camp) where women and children would stay while men traveled between the Tulameen and Fraser Rivers across the Cascades while engaged in trading activities. Although both sites pre–date AD 1846, they indicate a northern population aggregate in the valley. Although no data are currently available, an additional northern aggregate may have once been centered at Aspen Grove, at the northern limit of traditional Upper Similkameen Band territory. The following are the ethnohistoric population centers:

Zu'tsamEn (Tulameen). Teit (1930: 204, note 13) recorded a population centred between Graveyard creek and the confluence of the Similkameen and Tulameen Rivers. This area was pre–empted by John Fall Allison and is now the site of the Weyerhaeuser Canada Ltd. mill and log storage facility. He recorded this band as Zu'tsamEn [Tulameen], "red paint", in reference to the large ochre source several kilometers upstream on the Tulameen River. In a footnote, he wrote that they were called the Vermillion Band. In September 1877, Dawson (1891: 398) wrote that he had gone with an Indian (not named) "to visit a remarkable paint locality of the Indians about 3 miles up the North Fork".

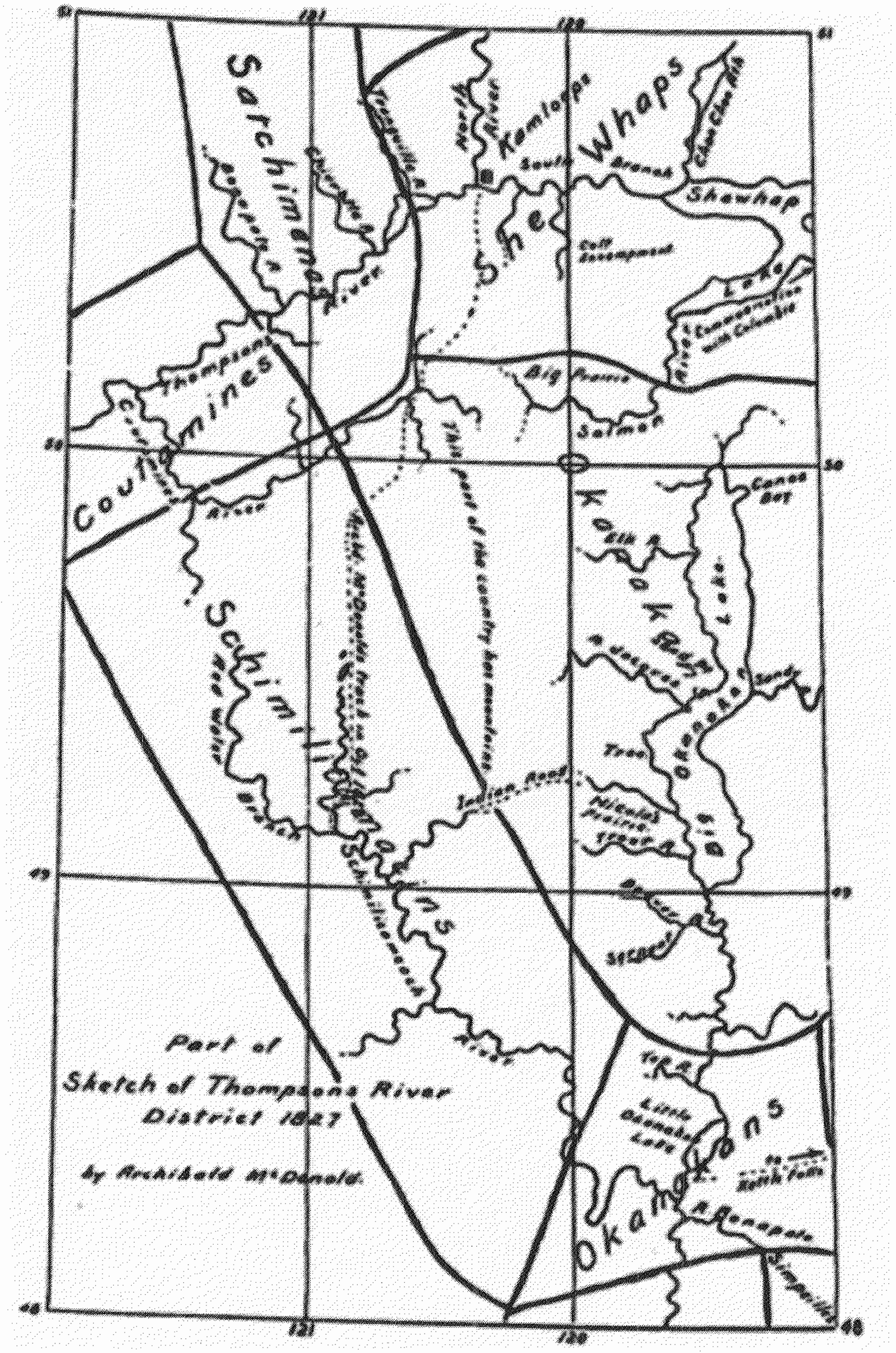

Figure 3.3: 1827 Map of the Similkameen Valley

(after Okanagan Historical Society 12th Annual Report 1948: 12)

Nlhkai'xElox. Nlhkai'xElox was a site "about 11 miles below Princeton, north side of Similkameen River; 3 houses" (Teit 1930: 205). Teit stated that the people were nearly all Thompson and that some descendants lived in the village of Nlhkai'xElox several kilometers downstream. This reference to a Thompson population reflects the degree of population movements and intermarriage in the late pre–contact and early post–contact periods among peoples of the Nicola, Similkameen and Thompson River valleys. In June 1877, George Dawson (1891: 330) wrote "Quite a camp of Indians about a mile up the N Fork, now living on nothing in particular but waiting for something to turn up. Own a good many horses, & some cattle". This refers to the Tulameen band as well, indicating that an area up– and downstream of the Similkameen–Tulameen forks was an important population center.

Snazai'st. "Striped rock ... on the north side of the river, a little east of Twenty–mile Creek ... and the town of Hedley; 10 houses ... there were 6 houses and a church at Snazai'st proper, 2 houses west of Twenty–mile Creek, 1 across the river, and the chief's house –10 houses in all" (Teit 1930: 205). Snazai'ist (DiRa–20) is the only Similkameen village tested archaeologically (Copp 1995, 1999l, 2000b). Two radiometric dates on cultural ungulate bone indicate one of four pithouse features was occupied ca. 2,000 BP and again during the late 19th Century (Copp 2000b).

Tcutcuwi'xa (Chuchuwaya). "On same side of river, a little below (Snazai'st); 3 houses". (Teit 1930: 205). According to Teit, Tcutcuwi'xa is an Okanagan term indicating long–term relations with those valley polities. Also called the Hedley Band, it is preferably referred to as the Upper Similkameen Band. The 19th century band was originally situated downstream of the confluence of the Similkameen River and Hedley (Twenty Mile) creek in at least two villages: Tcutcuwi'xa and Snaazai'st. Similkameen elder Harry Robinson (Robinson and Wickwire 1992: 232) described the community and activities at Chuchuwaya in the following terms:

> The Indians, they had a camp. Over there, where that church is now. And down that way, towards the river. That's where they had a camp. A lot of Indians. And they have a camp there, and they go up hunting. Up to where they call the – Nickel Bridge Road – is now, they call it. But there was a trail there, those days. So the Indians they go hunting that way.

John Fall Allison's observations, recorded in the 1860s (Allison 1976: 26–27) provide some of the earliest descriptions of the Chuchuwaya community and its people.

> About March that year the Chinooks began to blow and the snow melted gradually, leaving green grass all over the range. Then the Indians seemed to awaken from their winter's lethargy and the whole of the Chu–chu–ewa tribe started out, some to the mountains, some to

> hunt, and some to visit friends at Nicola and Coldwater. At the time I am writing of the tribe living at Chu–chu–ewa were under Quinisco, as the Bear Hunter, and numbered nearly two hundred (today I doubt if they number ten). Quinisco gained his name as a hunter from the courageous way he hunted and attacked grizzly bears ...

These accounts are included in order to emphasize the generalized Plateau cultural patterns they contain: winter villages and non–winter camps situated near the Similkameen river, upland hunting, the presence of trails leading into upland resource areas, population numbers, and social networks extending north into the Nicola valley.

Lower Similkameen Villages.

Teit (1930: 205–206) listed the following lower valley villages:

Acnu'lox [Ashnola]. The Ashnola band, now combined into the Lower Similkameen Band, was located at, or near, the confluence of the Ashnola and Similkameen rivers (Teit 1930: 205). This area remains a population center for Lower Similkameen Band members. Copp (1975, 1998a, 2003a), Copp and Hudson (1995c) and Copp et al. (1995b) recorded lithic scatters, rock art, sacred sites, petroforms as well as historic and pre–contact talus burials in the area;

Nsrepus (Nsre'pus) or Sxa'nex (Sa'nex), "where the stone sticks up or is planted" (Teit 1930: 205). This refers to the area around "Standing Rock" on the Alexis Reserve (IR #9). It is a large glacial erratic boulder with pictographs. Other ceremonial boulder features are found nearby (see Appendix E);

KerEmye'us [Keremeos], this was a site located on the west bank of the Similkameen River opposite the town of Keremeos (Teit 1930: 205). It was likely Chopaka Band lands near the confluence of Keremeos creek and the Similkameen River. No archaeological work has been conducted within the town site to date but pre–contact sites and isolated artifacts have been found in the vicinity. Chopaka now refers to the population based near the International Border;

Keremyeus (KerEmye'us), the town of Keremeos includes the location of this community within its boundaries (Teit 1930: 205). Muncipal and private lands cover the river floodplain and terrace. Sites may still exist in less developed areas;

Nkurau'lox (Knurae'lox), this location refers to a site located about seven kilometers south of Keremeos on the south side of the Similkameen River (Teit 1930: 205);

Tsakeiskenemuk (Tsakei'sxEnEmux), "on a creek along the trail between Keremeos and Penticton" (Teit 1930: 206), probably the present vicinity of Olalla;

Ntleuktan (Ntleuxta'n), "on the south side of the Similkameen River, opposite Skemkain" (Teit 1930: 206);

Skemkain (Skemquai'n), "a short distance below Nkura–elok" (Teit 1930: 206);

Ntleuxta'n, On the south side of the river opposite Skemkain (Teit 1930: 206);

Smelalox (Smela'lox), "on the south side of the Similkameen River, about 10 miles below Nsrepus" (Teit 1930: 205);

Kennedy and Bouchard (1998: 241–242, figure 1) list other named villages in Canadian Similkameen territory. Some correspond to Teit's (1930) list:

A?klqiz^{w}*lx* ("having suckerfish"), corresponding to Teit's Nlhkai'xElox (?) between Princeton and Hedley.

They list a cluster of villages south of Keremeos to the 49th Parallel:

A?ktqi?isxnm ("'having marked rock");

Cecewixa?x ("a bunch of creeks");

Asnula?x (Ashnola);

Yipx<yt ("Standing Rock": IR. No.9);

QiQi?isxn ("lots of marked rocks" [pictographs]);

Sntamtktn ("eight–tie–top lodge");

Nk^{w}*ar?ula?x*^{w} ("having yellow ground");

Ktkearmiws ("cut along the flat");

Ktkekermiwa?s ("little cut in flat area");

Sn<x^{w}*ex*^{w}*tan* ("killing place");

Skmqin ("head end");

A?csmla?la?x^{w} ("clay land"); and *Sknnusestn,* corresponding to the modern Reserve community near Chopaka.

An interesting settlement pattern can be discerned in this list in that named villages alternate between the north and south banks of the Similkameen River and cluster near the confluence of Keremeos creek and the Similkameen River. This pattern matches the increasing widening of the valley between Keremeos and the International Boundary, where there are river terraces situated on the south (actually southwest) side of the valley (See Figures 2.6 to 2.8). The reverse situation holds for villages in the Upper Similkameen drainage, where sites were primarily situated on the north or northeastern bank of the river. Additional information can be determined from records dealing with the setting out of Reserve lands. All Reserve holdings were confirmed by the Royal Commission for Indian Affairs for British Columbia (1916). The following reserves were confirmed for the Upper Similkameen Band, all of which contain recorded or unrecorded traditional use and/or archaeological sites:

Similkameen Villages in the United States.

Teit's (1930: 206) lists Similkameen villages located south of the nternational boundary as follows:

Hepulok (Xe'pulox), [located south of the 49th Parallel, near the confluence of the Similkameen and Okanogan Rivers];

Konkonetp (Ko'nkonept), "near the mouth of the Similkameen River". Bouchard and Kennedy (1984: 24) cite informant data suggesting that this site was located further south near the town of Okanogan;

Kwahalos (Kwwaxalo's), "a little back from the Similkameen River, below Hepulok";

Nalitok (Na.sli'tok), "just across the International Boundary in Washington";

Skwwa'nnt, "below Kwahalos"; and

Tseltsalo's, "below Kwahalos".

Kennedy and Bouchard (1998: 241–242) list only two villages south of the International Border:

N?a?selita?kw, "having two small creeks"; and

Stex^{w}ta?x^{w}ilxtn, "where fish jump".

It is probable that there was a major population center near the confluence of the Similkameen and Okanagon Rivers and near Keremeos. Bouchard and Kennedy (1984) as well as Salo (1987) attributed this to the major fishery at Squantlen Falls. Bouchard and Kennedy (1984: 25–26, citing Lerman 1954) recorded "that salmon were so plentiful around the mouth of the Similkameen River that as many as "3,000 to 4,000" Indians from many miles in all directions gathered here annually during the height of the [salmon] run".

Salo (1987: 50–52), working upstream of Enloe Dam and in the Palmer Lake area, did not locate evidence of ethnohistoric and/or proto–historic village sites. Based upon surface artifact finds and private collections, this area appears to have been only sporadically occupied during the last 2,000 years. More intensive occupations are typologically dated within the mid–Holocene (ca. 6,500–4,000/2,000 BP), even though elsewhere in the northern Columbia Plateau the pattern was one of increasing sedentism associated with large villages (Campbell 1985; Chatters 1984, 1986, 1989; Grabert 1970, 1971; Salo 1987). This is especially evident in terms of larger villages (Campbell 1985; Chatters 1984, 1989; Grabert 1968, 1970, 1971) clustering near the confluence of the Okanogan and Similkameen Rivers as well as in the Wells and Chief Joseph Reservoirs along the Upper Columbia River. Salo (1987: 50) hypothesized that salmon were once available upstream of the falls. This would explain the higher frequency of mid–Holocene sites near Palmer Lake. To date, no additional data have been collected to test this hypothesis. Excavations (see Appendix A) have yet to produce evidence of fish remains, other than two small trout–sized vertebrae at Snazai'st Village (DiRa–20).

Similkameen Settlement Patterns

From about December to the end of February or beginning of March, some – perhaps a majority – of community members lived in clusters of semi–subterranean pithouse or mat lodge dwellings. From March to the November, community members opted to live in lighter conical reed mat lodges (Allison 1976: 73; Teit 1930) similar to the Plains tipi. These were portable and apparently used more frequently after the acquisition of the horse by the mid–eighteenth century AD. The core of pre–and post– horse settlements consisted of circular winter pit and mat houses possibly occupied year– round in some settlements near anadromous fishing resources. To date only two pithouse villages have been recorded mid–valley in Canadian territory: 1) Snazai'st (DiRa–20), a site with four shallow saucer–shaped cultural depressions situated on the east bank of the Similkameen River downstream of Hedley, and 2) DhQx–05, with four or five shallow pithouse depressions located on the west bank of the Similkameen River upstream of Keremeos. The cultural depressions measure between four and five meters in diameter and are less than 50 cm deep (unexcavated). There are two unrecorded shallow pithouse depressions on the Ashnola (IR#10) Reserve upstream of Paul Creek.

Four deep pithouse depressions measuring four to five meters in diameter and 75 cm to 1.50 meters deep are present: 1) one on the Lulu Reserve (not recorded on government site forms) on the east bank of the Similkameen River, 2) another that has been used as a 19th century storage cellar with added stone work located on a high terrace above the east bank of the Similkameen River near Stemwinder Creek, 3) a third on the second terrace of the east bank of the Similkameen River above a recreation camp that has been used as an illegal marijuana growing operation, and 4) DhQx–09 on the first terrace above the south bank of the Ashnola River (Figure 3.4). None have been excavated to date.

As indicated previously, areas where villages have most likely been destroyed by 19th and 20th century activities include the confluence of the Similkameen and Ashnola Rivers (town of Princeton, Weyerhaeuser Canada Ltd mill and police station) and the town site of Keremeos. Other village areas may currently be under cultivation or buried by erosional sediments. These include the Wolfe Lake area, confluence of the Ashnola and Similkameen Rivers and cultivated terraces south of Princeton to the 49th Parallel. Systematic surveys and excavations, most on private lands, would be required to locate these.

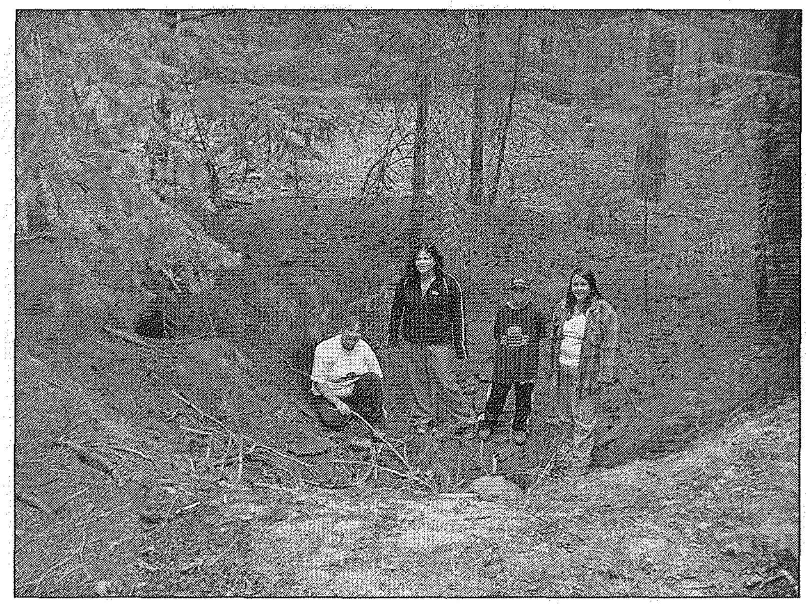

Figure 3.4: Deep Housepit Depression with Side Entrance

Within and at settlement edges were additional features such as circular cache pits and earth ovens. These had a diameter of about 1.5 to 2.0 meters. Brush huts made of fir or pine boughs where girls' puberty ceremonies and/or womens' menstrual huts were conducted were located near the edges of settlements. Further away from the settlement were resource–use locations including temporary hunting camps, fish weirs, deer blinds, as well as berry and root–gathering locations. Also at some distance from camp were burials, often located at the base of rockslides (talus slopes). There were also pictographs, circular arrangements of rocks placed by girls during puberty ceremonies, sweat lodges and sacred sites of various types [see Wilson (1970: 121) for an 1859 description].

Non–winter populations split into smaller band to micro–band or family groups based in residential camps along rivers and lakes in valley bottoms. Micro–band or individual family task groups radiated from residential camps into surrounding hillsides and uplands intent upon foraging for roots, berries as well as hunting and fishing. Copp and Hudson (1995a) recorded ethno–historic data for this pattern in their study of Murphy (Bear) lakes in the Tulameen watershed. Individuals or small hunting groups traversed the highlands of the Cascade and Okanagan ranges in their quest for game, lithics and other commodities (Allison–McDiarmid 1978; Wilson 1970).

There were several locations within valley watersheds for the procurement of specific trade items. Examples cited previously included red ochre, eagle feathers, animal hides and cordage manufactured from Indian hemp (*Apocynum cannabium)*, also called Dogsbane (G.

Douglas, personal communication 1995). The coalescence of Plateau groups at a few central locations for economic and social activities (trade, first fruits and first salmon ceremonies as well as winter ceremonies) brought speakers of different languages into contact. Consequently, Similkameen Valley inhabitants were in constant contact with other Salishan speakers as well as Sahaptin, Kutenaian and Siouian speakers.

Key social and winter gathering places included specific locations at Nicola Lake, Spences Bridge, Okanagan Falls, near the Tulameen ochre source, the Stirling and Keremeos creek locales and the confluence of the Okanagan and Similkameen Rivers. Teit (1900: 260) indicated that some Okanagans wintered on the lower Nicola River. He (1900: 259) also recorded people from Spences Bridge, Nicola and Lytton trading with the Similkameen in the autumn at, or near, Keremeos. Dawson (1891: 401) described a gathering of native peoples in September, AD1877, at the mouth of the Coldwater River in the Nicola Valley. While he doesn't specifically mention Similkameen people, it is likely they attended. He stated "(m)any Indians now collected here, from different parts of the country, & more expected. The exact manner of the 'play' I cannot understand, when all arrive and there is to be a sort of *cultus* potlatch, & some Ceremonial burying of the dead ... At present there are two camps of Indians." Nineteenth century accounts indicate Similkameen people traveling to the vicinity of Hope on the Fraser River in order to exchange local products for salmon and other goods (Copp 1998b; Hudson 1996).

Evidence presented above indicates that there were a number of historic named village groups in the Similkameen valley. These groups occupied and used the resources of watersheds (defined by a river or lake system and the adjacent highlands and mountains), or watershed segments, and had exchange relations with groups in neighbouring watersheds. Examples include past populations seasonally centred in Upper Similkameen locations and at various places in the main valley south to Palmer Lake and especially at the confluence of the Similkameen and Okanagan rivers (Copp 2002b; Copp and Hudson 1995c; Hudson 1994, 1996; Teit 1930).

Subsistence and Oral Tradition

Oral traditions record an emic rationale for the absence of salmon upstream of Squantlen Falls. Several variations of a story involve Coyote, the trickster figure in Okanagan–Similkameen mythology. The basic pattern has Coyote creating a rock barrier at Squantlen Falls (Figure 3.5) after being denied a Similkameen wife (Bouchard and Kennedy 1984; Douglas, personal communication 1995).

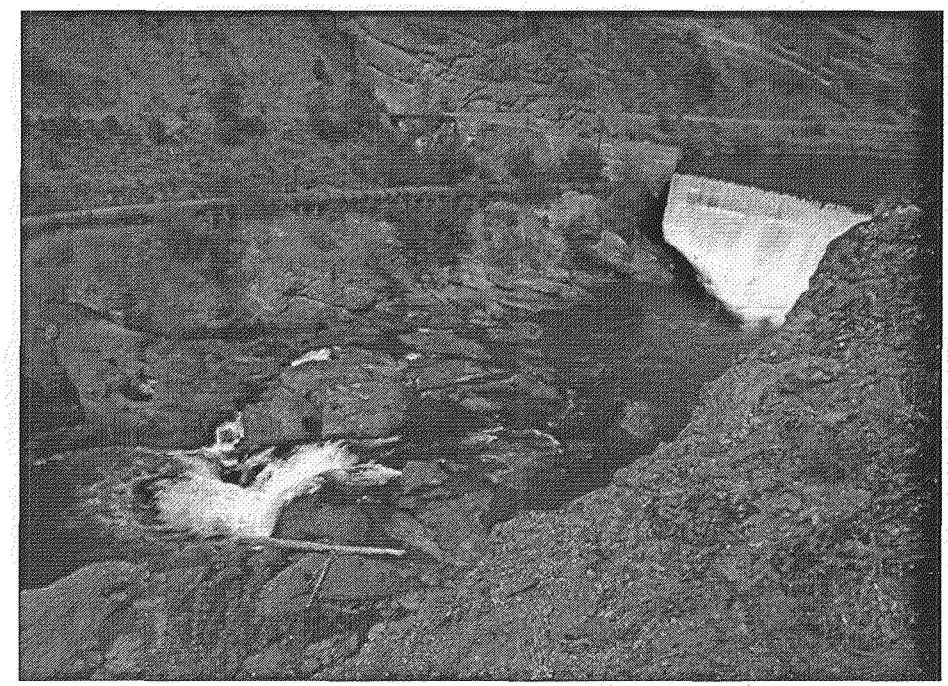

Figure 3.5: Enloe Dam at Squantlen Falls

Sacred Sites

The wanderings of Coyote are recorded in several landscape features. Rock formations, for example, are referred to as "Coyote's fishing place," "Coyote's kettle or wishing well," "Coyote's washbasin" (DhRa–07), "Coyote's penis" and "Coyote's daughter or wife" (Figures 3.6 to 3.8). Most of these rock formations carry no special markings and their meanings and associations with Coyote are embedded in oral traditions (Bouchard and Kennedy 1984; G. Douglas, personal communication 1995; Mourning Dove 1933, 1990; Teit 1930). Several myths have been identified with specific natural rock formations in the valley. One of these is public knowledge and concerns Coyote's daughter (or wife). This is a large rock formation situated on the south side of the Similkameen River about 1.5 kilometers above the rapids leading to Squantlen (Enloe Dam) Falls in Washington State. Two additional rock monuments are recorded in the provincial database but many others are not. For example, a dead Ponderosa Pine exhibiting several embedded, or grown over, deer antlers is a culturally significant feature located near Coyote's Wishing Well, but has not been recorded at the specific request of the Similkameen First Nations.

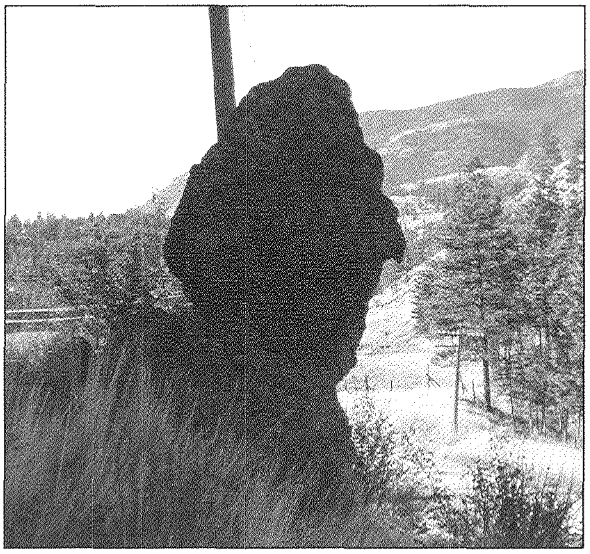

Figure 3.6: Coyote's Penis (Okanagan Valley 1974)

Figure 3.7: Coyote's Penis (Similkameen Valley 2002)

Figure 3.8: Coyote's Wishing Well, Similkameen Valley (2002)

The Tcutcuwi'xa rock shelter (DhRa–02) near Hedley exhibits dense clusters of pictographs, which are considered sacred. Excavations focused on the removal of cultural sediments from five contiguous one–meter–square units. Cultural materials recovered included small quantities of lithics, bone and fire–altered rock as well as fragments of red ochre and rolled birch bark (Appendix A). Compared to rock shelters of similar size in the Cascade Range and elsewhere, the paucity of materials recovered was surprising. The most likely explanation is that the rock shelter did not serve primarily as a task–oriented camp (i.e. hunting), but functioned as a sacred–ceremonial site, most likely supporting activities associated with shamanistic rituals. Three radiocarbon estimates on culturally modified ungulate bone range from approximately 1,100 to 3,800 BP (Appendix A).

The Historical Similkameen

By the mid–1800s the Similkameen Valley became used for activities associated with the fur trade, horse and cattle ranching. The Hudson's Bay Company (HBCo) established Fort Similkameen in 1860 near present–day Cawston. It was later moved to a location about five kilometers upstream as Fort Keremeos where it functioned until 1872 (Webber 1993). During this period Similkameen people worked on pack trains bringing supplies from Hope to Princeton (Hudson 1996; Robinson and Wickwire 1992: 102–103) over trails scouted by A.C. Anderson in 1846 (Copp 1998b, Hudson 1996; Palmer 1860). Furs were transported from Fort Okanogan in Washington up the Okanagan and Similkameen valleys by horse brigades. One path followed by the early brigades crossed the Tulameen Plateau from Blackeye's camp at Otter Lake to the Coquihalla River, following it to Forts Hope and Yale on the Fraser River.

A number of historic trails, most likely following pre–contact routes, connected the Tulameen and Princeton areas with the Fraser River area near Hope, as well as the Skagit Valley in Washington State. Hudson's (1996) study of indigenous trails specifically mentions the Hudson's Bay Horse Brigade, Blackeye's, Whatcom and the Royal Engineers' (also known as Dewdney or Old Hope) Trails extending throughout the region northwest of major Similkameen and Tulameen River drainages (Copp 1998b; Hudson 1996). Teit's undated manuscript records a story of the two brothers who had killed a cannibal living in Nicola Lake. The brothers traveled to the Similkameen where "they were driven off by old Coyote and crossed the Mtns by the Tulameen trail to the coast" (Kirk 1972: 14), suggesting pre–contact ages for some trails.

In the mid–1800s, ranching and wage labour augmented the traditional native economy. By the early 1900s such labour had become an integral part of the Similkameen Aboriginal economy (Hudson 1986, 1990, 1996). Aurelia Allison– McDiarmid's memoirs (Allison–McDiarmid 1978) provide an extemely useful account of these times for both native and non–native inhabitants of the valley. Particularly interesting are her accounts of early miners and their workings near the town of Princeton. These have bearings to ongoing archaeological and traditional use studies being conducted by the Upper Similkameen First Nation. She provides additional information with regard to the social life of natives and non–natives, ethnic Chinese miners, a profile of Mr. Edwards (actually, the famous train robber Bill Miner) and his comrade Shorty Dunn, an AD 1880 earthquake near the Chuchuwayha Indian Reserve (I.R. No. 2), as well as various First Nations legends. On a personal note, a record of an ex–sea captain named Copp took this author by surprise.

Accounts of Cosotasket (the Mountain Chief) and his travails in the highlands figured prominently. In one account (Allison–McDiarmid 1978: 60), Cosotasket was hunting marten and traveled "through Lightning Pass up to the Skyline, where Mt. Hosomeen loomed above, hence, down to Skagit Creek where his traps were set, a small bush teepee at every day's journey along the line". This story is credited to Susan Allison (1892, 1976) and specifically mentions the establishment of trap lines into the Skagit River drainage, an important variable for modern land claims and traditional rights discussions. These accounts point to First Nations' use of highland areas as access routes and as areas visited for resource procurement and other short–term activities. Recent research (Copp 1999b, c, h; 2000a, c; Gould 2001a; Reimer 2000) has confirmed the presence of high elevation archaeological sites pertaining to these and other foraging strategies with evidence of more intensive use than generally acknowledged in past predictive or traditional use models.

By the 1870s preemptions for farms and ranches had reduced Similkameen First Nations' land access and created a situation of potential conflict. Petitions from non–Indian ranchers in 1878, for example, called on the Indian Reserve Commission to restrict the size of reserves (RG 10, Volume 3769, file 11: 990).

One of the major historic economic changes in the Similkameen Valley was associated with large–scale mining operations. Several mining centres emerged in Similkameen territory in the late 1800s and early 1900s – near Hedley, Princeton and Keremeos. The mineral potential, especially gold, of the Similkameen region was known from the mid–1800s primarily based on reports from the International Boundary Commission. Paterson (1981: 44–61) describes the rise and fall of the mining communities of Granite City, Tulameen, Coalmont, Leadville, Blakeburn, Copper Mountain/Allenby, Hedley, Similkameen City, Upper Keremeos and Keremeos Centre. Hedley, Upper Keremeos and Keremeos are more important for historical developments in the lower reaches of the Upper Similkameen (see Copp 1998b for a summary). Prospectors in the Upper Similkameen had been searching major and minor stream drainages for gold since the 1860s. Although coal was fundamental to the founding of Coalmont and Blakeburn, plans for these towns never quite met expectations and they never prospered – although Coalmont is still in existence. Copper served as the foundation for the towns of Copper Mountain and Allenby (often referred to simply as "Copper Mountain"). Copper was first discovered on Copper Mountain ca. AD 1888, but serious workings were not developed until 1896 when R.A. (Volcanic) Brown began excavating. Work continued on various parts of the mountain through the First World War and the Depression. Open pit mining commenced in 1952, but the mines continued to open and close with fluctuating global prices for ore until 1979. From 1979 until its 1996 closure, the workings on Copper Mountain provided one of the main economic bases for Princeton.

The Similkameen–Athapaskans (Stewix)

In proto–historic times (prior to AD 1826), an extinct Athapaskan–speaking population was reported to have occupied the Nicola and Similkameen river valleys of southern British Columbia (ARCAS Associates 1993; Bouchard and Kennedy 1984; Kennedy and Bouchard 1995, 1998; Salo 1987; Teit 1895, 1900, 1930; Wyatt 1971, 1972, 1998) see Figure 3.9. The identification of an Athapaskan presence in the Similkameen Valley is alternatively a matter of concern, or pride for some among the Similkameen First Nations.

There is general acceptance that, prior to AD 1800, and possibly as early as 1200 BP, the area from Nicola Lake to the confluence of the Similkameen and Okanogan rivers was occupied by a population speaking an Athapaskan language (ARCAS Associates 1986, 1993; Boas 1895; Bouchard and Kennedy 1984; Duff 1969; Hudson 1986, 1995, 1996; Hunn 2000; Kinkade et al. 1998; Magne 2001; Magne and Matson 1984, 1987; Magne and Fedje 2003; Teit 1895, 1900, 1930; Wilson et al. 1992; Wyatt 1972, 1998). The first to report an Athapaskan presence in the southern Fraser Plateau was Dominion geologist George Dawson. In conversation with a single Nicola informant he wrote "that he, with seven other men and some women and children belonging to them were now [*i.e. AD 1888*, emphasis added] the only true natives of the Nicola region" (Dawson 1891: 25). Teit (1895) consulted several native informants who confirmed this story.

Dawson recorded some vocabulary terms and an origin story collected by J.W. MacKay, the Indian agent at Kamloops (MacKay 1895, cited in Wyatt 1972, 1998). The story related how the Nicola people descended from a Chilcotin war party that had attempted to ambush a Shuswap village one spring. Finding the village unoccupied, the Chilcotin continued to the mouth of the Nicola River, when they were forced upstream by the Thompson (Nlaka'pamux). There they

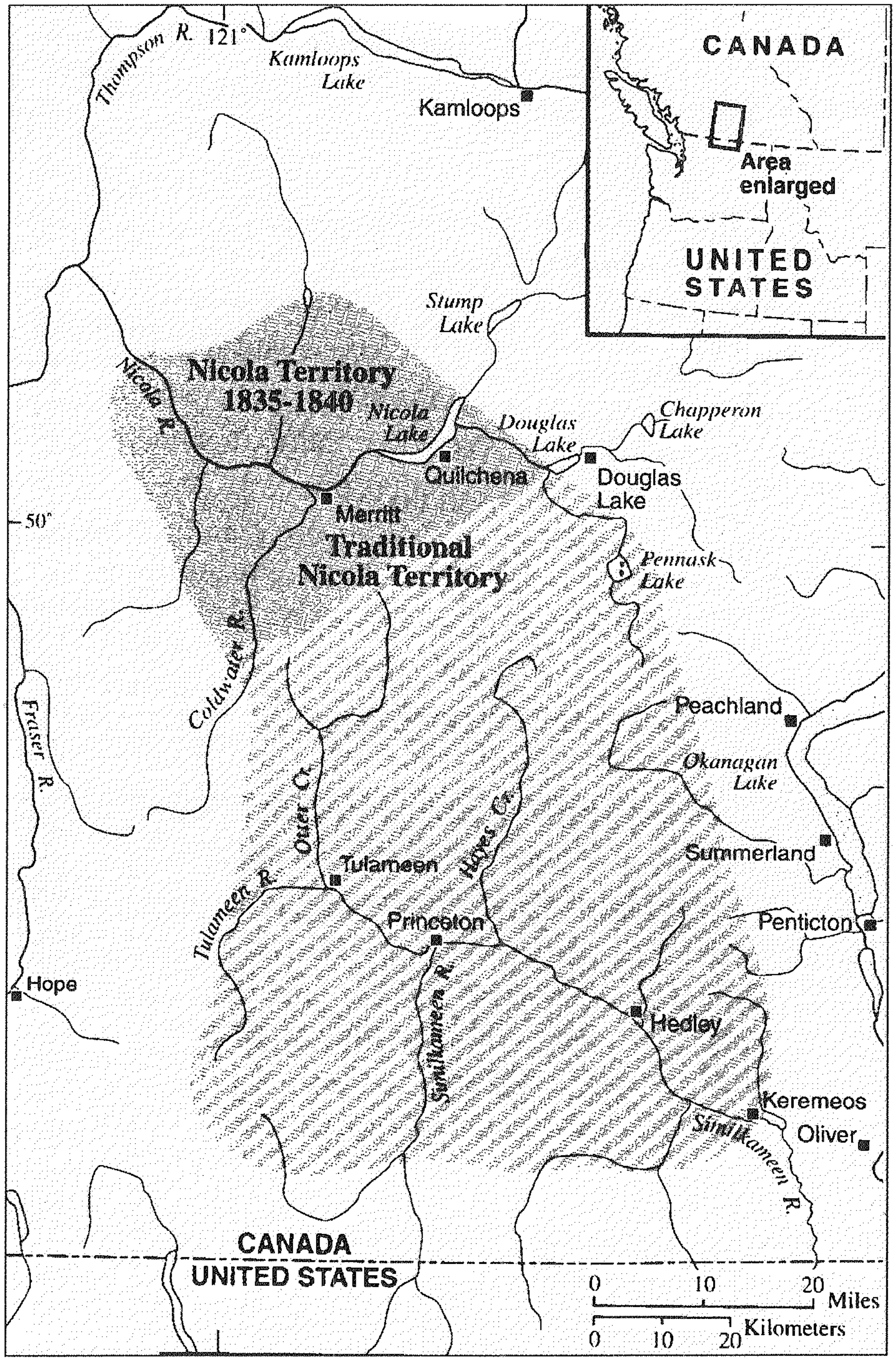

Figure 3.9: Ethnohistoric Nicola–Athapaskan Distribution
(after Wyatt 1998: 221, based on Teit 1900–1921)

remained and eventually intermarried with Thompson and Okanagan peoples (Dawson 1891: 24). Confirmation of McKay's story comes from Susan Allison (1892: 305). She stated that the Nicola derived from a Chilcotin war party entering the Nicola Valley, with some continuing south into the Similkameen Valley. This was thought to have occurred about AD 1740. Wyatt (1972, 1998: 220), probably relying upon Dawson (1891), stated that Mrs. Allison was well acquainted with J. MacKay and probably received this story from him.

The third source comes from James Teit (1895, 1900, 1930) cited in Boas (1924) as well as Walker and Sprague (1998) and corroborated by informants' recollections into the 1970s (Bouchard and Kennedy 1984; Hudson 1994, 1996). Kirk (1972) transcribed an undated, hand–written manuscript copied from Teit's (1895) original files. Teit's manuscript, modified here (brackets) for clarity but retaining original spelling and grammar, stated ...

> There is a tradition collected by the late J W McKay at one time ag*(ent)* in charge of the Kamloops–(O)kanagon Ind(ian) Agency that these Nicola–Similkameen Athabaskan(s) were decended from a party of Chilcotin who on migrating south located in the Nicola Valley which at that time was a hunting ground of the Thompson Ind(ian)s. Here they were hemmed in by large war parties of Thompsons and Okanagons sent out to attack them. After putting up a stubborn defensive fight the Athabaskans made terms with those tribes whose hunting country they had invaded. After promising to be their friends and allies and sealing the compact by giving some of their young women to be wives of the Thompson and Okanagon chiefs they were given territory and allowed to settle permanently in the central and upper parts of the Nicola & Similkameen Valleys.
>
> However (o)ther traditions assert that the tribe as far back as tradition goes had lived in these Valleys and at one time occupied them almost entirely from a little above Spence(s) Bridge on the North to a few miles above the International boundary in the South. That later the tribe was pushed by the Okanagon to above Keremeous on the Similkameen, whilst all the rest of their Country was over run by Thompson who constantly intermarried with them and had complete freedom for traveling, camping & hunting just as if the country was their own.
>
> Thus questions as to whether the country was originally an Athabaskan domain on which the powerful Thompson and Okanogan tribes later encroached during their expansion or was it already a main Thomspon hunting ground when the Athabaskans first appeared is rather uncertain, as well as the point as to whether these people were originally Chilcotins. Two things however are practically certain viz that they were the earliest really permanent dwellers in the Country of which there is traditional and historic evidence and that they were one of a chain of small Athabaskan tribes living isolated and surrounded by alien tribes at points on the plateaus and elsewhere along the Pacific slope from the main body of Athabaskans in the Northern interior of B C and extending south into central California.

> All things *(c)*onsidered and generally speaking there appears to have been a series of Athabaskan migrations southwards rather than an unbroken line of Athapaskans extending south which was later penetrated by other stocks who pushed them aside and isolated their remnants as some have suggested may have been the case. There are indications that not longer ago than perhaps 150 years or a little more the locality of the Mouth of the Nicloa River around Spence(s) Bridge was a meeting place or point where the territories of three tribes converged, the Stuwixemux from up the Nicola River, the Shuswap from up the Thompson and the Thompson Indians from below (Kirk 1972: 18–21).

This rather lengthy quotation appears to be the primary historic source attributing an Athapaskan–speaking population in the Similkameen Valley. Even this statement indicates uncertainty as to the origins and territorial range of a Similkameen–Athapaskan presence.

Bouchard (cited in ARCAS Associates 1993: 10–12), relying upon the earlier work of Teit (1910–30) and Lerman (1954) reported at least ten Okanaganized– Athapaskan place names that have been identified as being "Similkameen" in origin. These span the Similkameen River as far south as Tonasket in Washington State and northwards to Okanagan Falls in British Columbia. As such, there is consensus among historical sources is that an Athapaskan presence in the Nicola–Similkameen dated to the early 18th century, although Teit was open to the possibility of earlier occupations. The ontogeny of "Similkameen" and its variants is unknown. Christine Quintasket, writing as Mourning Dove (Humishuma), thought it translated as "white swans" (Mourning Dove 1990: 123). These were probably Trumpeter swans (*Olor buccinator*).

Teit (1900: 269) referred to the Athapaskan tribe (Tinneh) of the Nicola Valley. He suggested that there was a distinction between them and other Interior ethnic groups. For example, in his description of burial customs (Teit 1900: 330, note 1) he was referring to both the Athapaskan tribe of the Nicola Valley *and* the Nicola Indians. The implication was that the Athapaskan–speaking group who occupied the Nicola Valley was culturally distinct from surrounding groups of Salishan–speakers. Similarly, in his overview of Indian groups in British Columbia, Duff (1969: 30) wrote that most of the area around Nicola Lake "was formerly Nicola Athapaskan territory." He further notes that in 1916 the Coldwater reserves were "used by Upper and Lower Similkameen, Lower Thompson, and Siska in common." Duff was probably relying upon Teit's information. Upper Similkameen Band informants today, who at the time of writing require their names not be published due to land claims issues, lament the inclusion of the Coldwater Reserve with the Nicola. Strong feelings persist that the Coldwater (Nicola) area was Similkameen territory prior to Federal Reserve reorganization.

Teit's reconstruction of an Athapaskan–speaking population was based on interviews with several elderly Nicola men (Teit 1895: 552), one of whom recounted that there was a tradition that their territory once extended south to Keremeos (see quote above), or about half–way down the river towards the International Border. Bouchard and Kennedy (1984) extended this territorial limit to the Palmer Lake area south of the United States/Canada boundary based on 20th century oral traditions that included "Nicola" (Athapaskan) place names. Athapaskan place names have also been recorded in the Okanagan valley as far south as Tonasket in Washington State and between Osoyoos and Okanagan Falls in British Columbia (Bouchard and Kennedy 1984: 61). Wyatt (1998: 220, citing Boas 1895) stated that some of Teit's informants in the Nicola valley expressly disagreed with the Chilcotin war party story cited earlier by Dawson, MacKay, and Allison. Wyatt (1998) summarized linguistic information collected on the Nicola– Athapaskan language, primarily from the vocabulary list of MacKay (1895), as well as from work by Harrington (1943) that suggested a Chilcotin origin for Thompson Plateau and Pacific Coastal Athapaskan–speaking peoples. Wyatt cited Krauss' (1973, 1979) and Davis' (1975) linguistic research to be inconclusive as far as a Chilcotin–Nicola connection. Kinkade et al. (1998: 48–50) reviewed all linguistic documents relating to this issue and concluded that "Nicola remains a problematic case in comparative Athapaskan linguistics," although they did state that its affiliation with Chilcotin and Carrier has "never been in doubt … and likely represents a migrant group who broke off from them" (Kinkade et al. 1998: 67).

Workman (1977, 1979) suggested that a volcanic tephra eruption dating ca. AD 700 (Clague et al. 1995, West and Donaldson 2001) triggered an Athapaskan migration southward through the Interior of British Columbia and on to the Washington–Oregon coastal areas. Cultures in the latter areas exhibited Athapaskan languages ethno–historically (Harrington 1943; Hunn 2000) and linguistic studies (Krauss and Golla 1981: 68) suggest a migration through the British Columbia Interior and/or Cordillera prior to AD 500. As such, there likely is a causal relationship between the Nicola and the Chilcotin, albeit one retained in the story of a war party of ca. AD 1700–1740.

Bouchard and Kennedy (1984: 13) emphasized that Okanagan elders maintained a distinction between groups in the Nicola and the Similkameen Valleys

> Our research has shown us that elderly Thompson informants refer to the former Athapaskan inhabitants of the Nicola Valley as stewix, but they do not recognize that these are the same people who also used to live in the Similkameen Valley, nor do they recognize the term smEllekamux given by Teit (1898–1910) as the name of the former Athapaskan inhabitants of the Similkameen.

Conversely, present–day elderly Okanagan informants refer to the former Similkameen Valley Athapaskan residents as smlkamix (the equivalent of Teit's term), but they do not recognize them as the same people who also lived in the Nicola Valley and they do not recognize the term stewix by which the Nicola Valley Athapaskan were known.

Bouchard and Kennedy (1984) directly contradict Teit (1930: 203–204, 213–216) who stressed the existence of Stewix (variant Stuwix above) throughout the Similkameen Valley as far south as the confluence of the Similkameen and Okanogan Rivers prior to the adoption of the horse in the early to mid–1700s. After the horse was adopted, Teit (1930: 213–216) indicates that the Stewix were either pushed out of the lower Similkameen Valley (i.e., Keremeos south to the confluence) or were assimilated by the Okanogan. Similarly, he cites increased trade and intermarriage for their assimilation by the Thompson in the upper Similkameen and Nicola Valleys.

Bouchard and Kennedy (1984: 21) point to a 1972 interview with elder Harry Robinson, now deceased, which can be seen to underscore the point that the present Okanagan–Colville speaking population in the Similkameen Valley is an extension of the ancestral Nicola–(Athapaskan) Similkameen population:

> Both the Okanagans and the Similkameens were afraid of each other ... They could not understand each other's languages, and so they used sign language ... The Okanagans ...cooked a lot of food for them ... The Similkameen asked that Okanagans to stay there with them ... After awhile, they became one band of people, because the old Similkameen people died, and the Similkameen children learned the Okanagan language ...

In this account, the "Okanagans" (actually the Methow) had come to the Ashnola Valley over the mountains from the Methow river valley. The Methow river valley drains into the Columbia but also provides an analogous physiographic setting to the Similkameen as it extends northwest into the Cascade Range for a riverine–montane lifestyle in pre–contact times. The Methow Valley appears to provide a similar analog for pre–contact lifestyles as it too lacks anadromous salmon resources. Similkameen elder Harry Robinson told a similar story to Hudson (1986, 1990). Robinson emphasized that the Methow were male hunters who stayed and married into the Ashnola groups.

With regard to the Methow as a Salish–speaking people, Kinkade (1967) studied Salishan place names in that valley and determined that many had origins in the Okanagan–Colville language even though the historic population spoke Columbia Salish. He concluded that there had been a population displacement of Okanagan–Colville by Columbia Salish on the order of a few hundred years. This evidence parallels the Nicola/Similkameen Athapaskan situation although data is scant in this case. Both indicate population displacement and/or acculturation in the late pre–contact to historic periods.

To summarize, this indicates at least a late pre–contact and early historical Athapaskan–speaking population in the general area consisting of two main groups:

1) the Stewix headquartered in the Nicola Valley, and
2) the Smlkamix (or "Similkemeugh") in the Similkameen Valley.

After about AD 1700, this Athapaskan–speaking population is assumed to have merged with neighbouring groups. The Stewix/Smlkamix, (Stewix is the preferred term), became Salishan speakers in the case of contact and intermarriage with the Thompson (or the Okanagan in the case of the Smlkamix) when the Athapaskan language ceased to be used. By the time ethnographic research was carried out in the late 19th century by James Teit, the Similkameen Valley was Okanagan territory and entirely Salish–speaking. As such, Similkameen Athapaskan populations were effectively absorbed, culturally and linguistically, into the Salish populations of the time.

It is difficult to unravel group relations in this region based on the existing literature. Continued archaeological work and an extensive search of archival documents are necessary. The conventional picture of an immigrant Athapaskan–speaking population about AD 1700–1740 most certainly does not preclude a dynamic process of group mergers during the 18th century. To further examine this question, it would be necessary to conduct ethnographic research among elders of the Similkameen and Nicola in order to develop congruence with information derived from Okanagan and Nlaka'pamux (Thompson) elders, but the inference here is that "non–Salish" cultural materials in the Similkameen archaeological record most likely represent extinct Athapaskan populations and/or cultural influences.

Chapter Summary

The Similkameen and Tulameen Valleys continue to be the center of indigenous populations, located in numerous villages at strategic locations within watershed systems although early population dynamics of the region are poorly understood. Current indigenous Similkameen individuals are concerned that, if an Athapaskan speaking population once shared, utilized or were in sole possession of the Similkameen Valley, then this will have a negative impact on land claims. The Similkameen First Nations have not, as yet, submitted any such claims. However, the problem of identifying a Similkameen–Athapaskan presence in the pre–contact and proto–historic periods is addressed in Chapters 7 and 8 of this thesis.

– CHAPTER 4 –

RESEARCH METHODS

This chapter provides an overview of research methodologies used to gather data for the thesis. It is the result of 11 years of fieldwork with projects split between those conducted as academic exercises (Langara College archaeology field schools), and those from consulting contracts (Itkus Heritage Consulting). All projects, whether academic or consulting, operated under constraints affecting research goals and methods. Included are discussions or presentations of some factors that restrict the nature of field research, a review of previous archaeology, the research conducted for this thesis, and the predictive model developed for archaeological overview and impact assessments from which data was derived.

Field Research (1993–2004)

Field Schools. The field schools are 12–week long academic projects where students spend half their time in classroom lectures and labs, and the other half conducting field work. Enrollments varied, averaging 22–25 students per term. Field methodologies are practiced during the first three weeks of the term, prior to actual fieldwork. The final three weeks of each term are employed in lab work, analysis and report writing. In this way students are trained to levels exceeding British Columbia government standards for fieldwork, and are therefore employable and form a useful resource for the heritage consulting industry in the province.

The downside of using field schools for research is the length of time it takes students to acquire field skills and even then, they make mistakes until they become proficient in survey and excavation methods. Although efforts are made to train students to a minimum level of proficiency by assigning non–critical survey and excavation tasks before working on the main project, usually a specific site, mistakes continue to be made. These can often be caught, and corrected, during the initial stages of the project by employing field assistants and supervisors. These are individuals from previous field schools or First Nation personnel with equivalent training and certification. Students are required to keep field notebooks and journals. Reviews of their documentation can often correct mistakes made in the field.

Although field schools are invaluable for conducting research, the main problems for data collection is the slower pace of acquisition, as well as the inevitable errors resulting from the training process. If an academic researcher recognizes these fundamental difficulties, he/she can still collect good research data although it may take longer than with trained crews.

Contract Archaeology. Projects conducted under contract often operate under less–than–ideal conditions. Virtually every field project conducted under contract that contributed to this thesis required a mixture of trained, partially–trained and untrained field personnel. This was a condition required by Similkameen First Nations (see Appendix B). Contractors generally do not provide funding for field–training. As such, researchers must effectively train some crewmembers "on the job". This can be accomplished by pairing trained and untrained crew as teams, although this results in lowering the pace and efficiency of the entire crew. On rare projects where work was conducted with fully–trained crews, the pace of work and efficiency was at least doubled.

Contract projects varied in size and scope from a minimum of two–person pedestrian field surveys, some involving shovel testing, to larger projects employing up to ten personnel. Projects with more than ten crew members require expensive additional crew with specific levels of First Aid certification. Larger crews also require field equipment and vehicles sufficient to satisfy requirements of the British Columbia Labour Code. As such, the maximum practical number of crew members employed for data collection was ten, whereas Labour Code restrictions do not apply to academic field schools so crew numbers could be tripled or even quadrupled. However, field school projects were only conducted where there was a maximum driving time to emergency health services of less than 30 minutes, since untrained or partially–trained crew members tend to require higher degress of health care.

Field Research Skills. Whether field projects operated as academic field schools or independent contracts, students and employees were taught proficiency in field skills required by academia and the heritage consulting industry. These included, but were not limited to: background research, report writing and record–keeping, ethnographic interview techniques, first aid, survey and mapping, orienteering with compass and map as well as GPS technology, photography, applied computer programs, aerial and satellite imagery interpretation, pedestrian field survey strategies, and excavation methods. Therefore, the goals of both types of projects included training as well as data collection.

Restrictions on Fieldwork

Government. Restrictions on fieldwork, research goals and methodologies vary from project to project. Consulting and academic projects have constraints imposed by time and funding. Research projects conducted under British Columbia government permit (Heritage inspection or investigation) must also meet standards imposed by research officers. Permit applications must be acceptable to these officers who have the ability to determine methodologies employed, sampling design and even the number and size of excavation units.

Government review and control of research designs is an acceptable part of the archaeological process in British Columbia as it ensures minimum and above–average standards of research are conducted. However, other constraints on research derive from First Nations.

First Nations. Many British Columbia First Nations have developed, and implemented, their own heritage permit process (see Appendix B). In some cases, First Nations' heritage permits place researchers under constraints that may impact research designs and goals. For example, Appendix B documents restraints that were to be applied to one of the field schools engaged in data collection for this thesis. Several conditions directly contravened existing labour legislation as well as personal ethics. These were dropped after discussions with the individual First Nations involved. Other conditions that affect research by putting restrictions on identifying First Nations individuals (privacy) or publishing culturally–sensitive information concerning kinship or sacred sites.

In effect, there can be two mutually–inclusive or exclusive permit systems in existence today. Researchers must be aware of government, industry and First Nations' restrictions that may limit research designs and goals. This author has found that most such restrictions can be accommodated and valuable fieldwork conducted. However, there is also a recognition that some restrictions reduce the value and efficiency of fieldwork, whether it is a government requirement that shovel tests be excavated at two–meter rather than five–meter intervals, or a First Nations' requirement that band members be paid trainees. Although efficiency and restrictions on information may limit research, good data collection can still be accomplished.

In order to provide a historical perspective, it is necessary to review the record of archaeology previously conducted in the Similkameen Valley:

Previous Similkameen Archaeology

Prior to work reported here, the most extensive archaeological investigations conducted in the Similkameen Valley were those by Brian Vivian (1989a, b). These studies focused on two important areas; the Princeton Basin and the Cathedral Lakes areas. Data collected were used to examine cultural interaction models involving the southern Fraser and northern Columbia Plateaus (Vivian 1992). His analysis of five land–use models led to the conclusion that a "Diffuse Cultural/ Ecological Transition Model" best explains site spatial and artifact temporal patterning in the valley. In Vivian's model, the Similkameen valley is characterized as a transitional zone between regional cultural interaction spheres, including the southern Fraser and northern Columbia Plateaus, the Kootenays and southern Coast. The Okanagan valley has been portrayed as a similar transition zone (Copp 1979; Grabert 1970). Transition zones are based upon similarities in settlement patterns, artifact features and types as well as social activities ranging from trade to intermarriage. Clinal patterns, as recorded by variation in frequencies of projectile point types, hearth features, presence/absence of hopper mortars made from boulders to housepit/pithouse structural remains and settlement patterns, are thought to represent simple distance–decay functions from cultural sources (Grabert 1970; Losey 1978: 115; Vivian 1992: 7).

This model fits well with hunting and gathering societies, such as pre–contact Plateau peoples. An important adaptive characteristic of hunting and gathering societies is reliance upon reciprocal exogamy and patrilocal residence patterns. As indicated in Chapter 3, these social patterns ensure corporate group survival but also introduce new material traits, peoples and customs that can be absorbed through syncretic adaptive behaviour by core resident groups in a region. Ethnographic and archaeological material culture studies indicate that Plateau peoples were highly mobile, especially in early through middle Holocene times. Mobility, as well as winter sedentism, increased in late Holocene times partly as a function of a shift towards a hunting and gathering–collecting strategy (Chatters 1984, 1986, 1989), as well as finally through the protohistoric acquisition of the horse (Chance and Chance 1982).

A criticism of Vivian's (1992) model is that it does not sufficiently recognize the effects of population migrations. Archaeological evidence of migrations, however is very difficult if not impossible to perceive in the generalized hunting and gathering material culture and settlement patterns of pre–contact Plateau peoples. Of particular importance to this research is the question regarding the past presence of Similkameen–Athapaskans. Ethnohistoric Similkameen culture fits a generalized hunting–gathering– fishing Athapaskan model for sub–arctic populations. Whether the archaeological record can verify the existence of distinct ethnolinguistic populations is discussed in following chapters.

Projectile point analysis and lithic raw material identification indicated that pre– contact Aboriginal populations were more influenced by, and interacted with, northern Columbia rather than southern Fraser Plateau populations. This contrasts with ethnohistoric information (see Chapter 3) indicating a great deal of contact with southern Fraser Plateau areas. His conclusion refutes the role of the Similkameen Valley as a natural corridor between the Fraser and Columbia Plateaus due to rare evidence of contact in the archaeological record (Vivian 1992: 128). Evidence to the contrary, that Similkameen populations shared early to late Holocene cultural interactions with both Plateaus is presented in Chapter 5.

The following table and discussions list the principal investigators involved in the archaeology of the Similkameen and Tulameen Valleys. Archaeological research is listed in chronological order (see Table 4.1, Appendix C).

Thesis Research

Fieldwork conducted prior to the 1970s was generally conducted primarily as contract research. After 1990, funding for archaeological fieldwork derived primarily from contract work through various provincial ministries, most notably the Ministry of Forests Small Business Forest Enterprise Program and the Ministry of Transportation and Highways, with additional funding by crown corporations such as B.C. Gas and B.C. Telephone (Telus). West Kootenay Power and Light, and forest companies such as Weyerhaeuser Canada Ltd., Tolko Forest Products, Gorman Brothers Lumber Company and Riverside Forest Products, also have been major contractors. The British Columbia government Forest Renewal B.C. program provided funds for inventory studies (Copp 1999d; Gould 2001a; Gould and Allison 2001). Research conducted in Lower Similkameen Band traditional territory also has a bearing on the findings reported here, including Reimer (2000) as well as the most recent fieldwork by this author (Copp 2002a, b; 2003a, b; 2004).

A majority of sites investigated were done so without government permit at the request of the Similkameen First Nation. Specifically, information derived from Wolf Lake (DiRb–1), Tcutcuwi'xa Rock Shelter (DhRa–02), Snazai'st Village (DiRa–20), Cool Creek (DiQx–10) and the Pinto Flats site are all located on Reserve lands (see Appendix A). Work conducted under contract was controlled by industry whereas research conducted on Reserve was not. However, both industrial and academic goals can be utilized in such a manner that theoretical models can be advanced.

All projects listed in Table 4.1 have contributed to a Similkameen archaeological database, including those inventory and impact assessment projects that yielded negative evidence. These projects have been invaluable for the generation of the site predictive model discussed below.

Site Excavations. The majority of past archaeological research in the Similkameen Valley has focused primarily upon site surveys or rock art studies. Relatively few sites been test excavated (see Appendix A) and fewer systematically excavated (see Figure 4.1). Regardless, Appendix A presents information on sites containing sufficient cultural material to contribute to the goals of this thesis: construction of a Similkameen culture history, evidence of a Plateau Microblade tradition, and evidence which could contribute to the identification of ethnic polities over time.

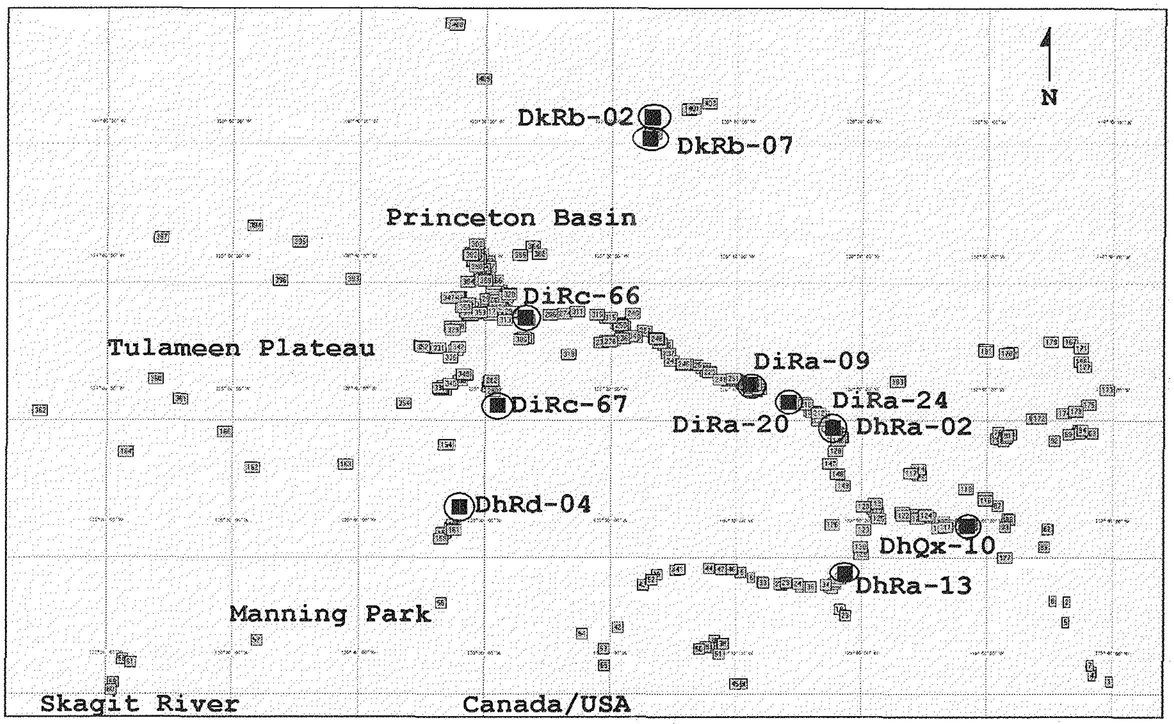

Figure 4.1: Similkameen Archaeological Sites I

Site Surveys. Prior to the 1990s archaeological site surveys were conducted as the result of investigator research goals and government–mandated surveys. Research–oriented surveys included Caldwell's (1954) pioneering judgmental survey, which relied heavily upon First Nations' informant information, as well as Copp's (1975) and Vivian's (1989 a, b) judgmental surveys. Carfantan's (1977) regional site inventory and Salo's (1987) surveys for the U.S. Army Corps of Engineers at Enloe Dam and Palmer Lake were state–mandated works. Otherwise, research overview and locational analysis of pictograph sites was the only other archaeological work conducted prior to 1990 (Beauchamp 1978; Corner 1968; Florian 1990; Hanson and Taylor 1975; Kennedy 1977; Peacock 1988). Vivian (1992) used his survey data (1989a, b) to develop the first regional analysis of Similkameen prehistory, although site excavations were not conducted.

The majority of site surveys and impact assessments conducted since 1990 have been industry (forestry, mining, hydro–electric, construction, telephone and gas line) related contract archaeology projects (Bailey and Will 1993; Bussey, Copp and Prager 2002, 2004; Copp 1996a, b; 1997a ,b ,c, d; 1998a, b, c, d, e; 2002a, b; Copp, Hudson and Webber 1993, 1994, 1995b; Copp and Hudson 1995a, b, c: Eldridge 1994; Handly 1997, 1998; Muir and Rousseau 1992; Rousseau 1992; Sykes 1993). Keyser's (1992) publication concerning rock art of the area was based upon pre–1990s research. Copp, Hudson and Webber (1995a) and Copp (1996a, b, c; 1998f, g) conducted research oriented field examinations of sites and potential site areas in Upper and Lower Similkameen Band territories at the request of the Bands, complementing industry–driven concerns.

Until recently, surveys of forestry and mining in upland areas have provided little information regarding past land use activities, or culture history since the results consist primarily of rare lithic finds, culturally modified trees, or historical mines and trails. This is primarily due to the fact that such survey areas, as defined by the industries involved, rarely include those land surfaces conducive to past occupations. Mining and forestry survey areas invariably are located on medium to steep slopes on sides of valleys and exclude flatter riparian and upland lake margins with the highest potential for sites. As such, a predictive model for was developed for the research reported here (see following discussion).

Although usually assumed to have low potential, upland areas contain certain important archaeological and traditional use sites. These include, but are not limited to; access routes (trails) to resource procurement areas, occupation sites in areas of low to moderate relief (that is, slopes of less than 20 degrees) with sources of potable water, lithic and bioresource procurement sites, and ceremonial sites. Specific activities conducted historically and in pre–contact times in upland areas included, but were not limited to: hunting, fishing, berry and root gathering, bark–stripping and lithic raw material quarrying.

At lower elevations, especially along river terraces, mountain bases and the river floodplain, a wider range of archaeological sites are evident. Those include seasonal (winter) villages characterized by small clusters of presumed pithouse and/or mat lodge features, isolated cultural depression (pithouse and/or mat lodge or cache pit) features, open sites lacking structural features characterized by lithic, fire–altered rock and faunal scatters, and rock or boulder shelters. Isolated artifacts, pictographs, petroforms, combination pictograph–petroforms, lithic and red ochre quarries, burials, trails and culturally modified tree sites are also predicted to occur.

The Similkameen Site Inventory Database

Due to computerization, the Archaeology Branch site inventory database has recently become more accessible. Site information can now be downloaded through email and read from a variety of software programs. Site data were previously available on computer diskette from which hardcopy could be printed. The most recent copy of the provincial database recorded 1,193 archaeological sites within the 16 – 1:50,000 scale NTS map sheets for which a database search was requested. Half of the 1:50,000 scale map sheet areas overlap with territories with First Nations along the Fraser and Coquihalla Rivers to the west and Okanagan to the east (Figure

4.2). Again, at least 25 culturally sensitive sites situated on Reserves in the area do not occur in the government database at the request of the Similkameen First Nations. It is likely that additional sites of this nature also are considered to be privileged information by the bands.

It should be noted that site inventory data was recorded at the 1:50,000 scale to comply with provincial standards. Although mapping at the 1:20,000 scale would provide better control of the data, this is currently hampered by the cost of acquiring map sheets and GIS or hand plotting site data. An additional problem lies with the site inventory database where consistently high frequencies of recorded sites have inaccurate latitude/longitude and UTM coordinates. A complete conversion of the existing 1:50,000 scale data to 1:20,000 was beyond the capacity of the researcher due to the costs involved acquiring digital terrain maps.

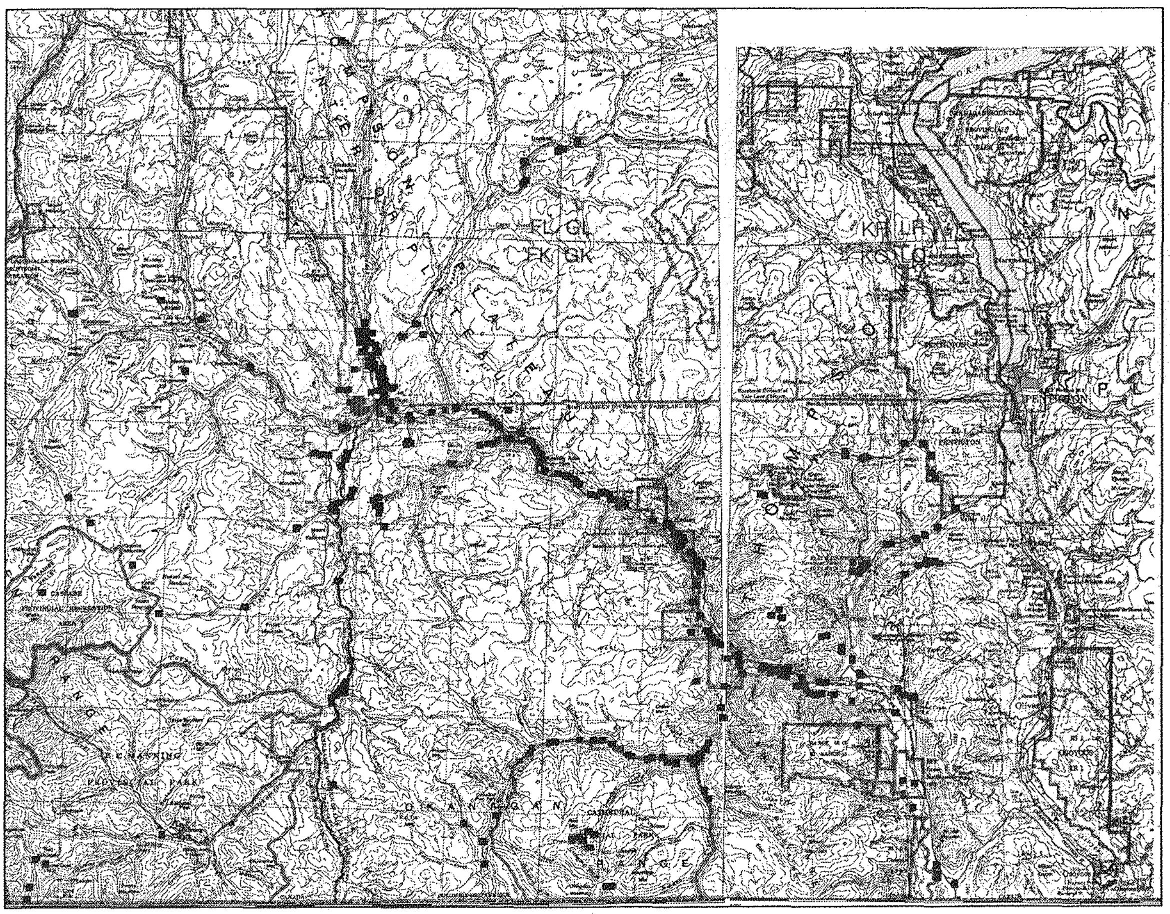

Figure 4.2: Similkameen Archaeological Sites II
(after NTS Topographic map sheets 92H "Hope" and 82E "Penticton)

Data Record Analysis: 1:50,000 Scale. The 1,193 recorded sites are classified under three general types: Pre– contact, Historical and Traditional Use, using Archaeology Branch classification. The latter type is represented primarily by Culturally Modified Trees (CMTs). Some sites include historical and prehistoric assemblages and/or traditional use types. For the purposes of this study, pre–contact (prehistoric) sites were separated from those recorded solely as historical or traditional use sites. Some pre–contact sites exhibit historical components and vice versa. Where this occurs the sites were included within a Pre–contact/Historical site type. Traditional Use sites were included with historical sites since most culturally modified trees in the area post–date AD 1846 and are thus considered to be of historical age under current provincial legislation. Pre–contact and/or mixed pre–contact/historical sites numbered 1,013 (85%) of recorded sites. Historical and/or Traditional Use sites numbered 180 (15%) of the known database. Tables 4.2 to 4.5 identify the spatial distribution of recorded sites per 1:50,000 scale map, first as raw count then secondly as percentage data. Tables 4.2 to 4.5 illustrate percentages within each category where the cell value is greater than 5% of the total.

Table 4.2: 1:50k Map sheet distribution

92H/14	92H/15	92H/16	82E/13
92H/11	92H/10	92H/09	82E/12
92H/06	92H/07	92H/08	82E/05
92H/03	92H/02	92H/01	82E/04

Map sheets 92H/03,06,11 and 14 overlap with non–Similkameen First Nations to the west. Map sheets 82E/04,05,12 and 13 overlap with Okanagan First Nations to the east. The sixteen–cell grids in the following tables correspond to the 16 map sheets listed in Figure 4.2.

Table 4.3: Total Sites per Map Cell Unit

 # Sites **Percentages**

				total						*N%*
80	13	52	121	***266***		6.7	1.1	4.4	10.1	***22.3***
145	29	14	85	***273***		12.2	2.4	1.2	7.1	***22.9***
108	45	152	163	***468***		9.1	3.8	12.7	13.7	***39.2***
31	10	49	96	***186***		2.6	0.8	4.1	8.0	***15.6***
364	***97***	***267***	***465***	***1193***		***30.5***	***8.1***	***22.4***	***39.0***	***100***

Table 4.4: Pre–contact/Historical Sites

\# Sites Percentages

				total						*N%*
45	6	42	100	***193***		4.4	0.6	4.1	9.9	***19.1***
123	26	11	73	***233***		12.1	2.6	1.1	7.2	***23.0***
97	38	143	158	***436***		9.6	3.8	14.1	15.6	***43.0***
23	6	44	78	***151***		2.3	0.6	4.3	7.7	***14.9***
288	***76***	***240***	***409***	***1013***		***28.4***	***7.5***	***23.7***	***40.4***	***100***

Table 4.5: Historical sites

 # Sites **Percentages**

				N						*N%*
35	7	10	21	***73***		19.4	3.9	5.6	11.7	***40.6***
22	3	3	12	***40***		12.2	1.7	1.7	6.7	***22.2***
11	7	9	5	***32***		6.1	3.9	5.0	2.8	***17.8***
8	4	5	18	***35***		4.4	2.2	2.8	10.0	***19.4***
76	***21***	***27***	***56***	***180***		***42.2***	***11.7***	***15.0***	***31.1***	***100***

From Tables 4.3 to 4.5 it can be seen that the distribution of known sites is highest along the eastern and western margins of traditional Similkameen territory. This is a function of overlap with non–Similkameen traditional First Nations' territories along the Fraser and Okanagan River drainages. Recorded historical site distributions reflect research conducted in proximity to 19th and 20th century centers of occupation along the Fraser River, the southern Nicola Valley, the towns of Princeton and Keremeos in the Similkameen Valley, as well as the towns and cities in the southern Okanagan Valley from Osoyoos northwards beyond Penticton, as well as trapping, mining and cattle ranching activities at higher elevations. Pre–contact and mixed pre–contact/historical sites share similar spatial distributions, with minor differences, as historical and traditional use sites. This is a function of past research focused on valley bottoms, especially within areas under 20th century impacts.

Data Analysis: Borden Grid System. The general pattern observed at the 1:50,000 scale can be improved through compilation of site type and location data extracted from the B.C. Archaeology Branch site inventory database. By comparing the traditional territory of the Similkameen First Nations and superimposing it on 1:50,000 scale maps, it is possible to refine the analytical technique discussed above. The total number of archaeological sites recorded within the traditional territories of the Similkameen First Nations totaled 407. Some sites exhibit multiple pre–contact, traditional use and/or historical components. Purely pre–contact sites or components numbered 347 while purely historical sites or components numbered 69. Culturally modified trees included five sites and there was one recorded root gathering area. Sacred sites numbered five, although many more are known to exist in the valley and have not been recorded at the request of Similkameen First Nations (see below).

Pre–contact sites included lithic scatters, pictographs, cultural depression habitation features, rock shelters, cultural depression cache pit features, burials, petroforms, cultural depression sweat lodge features and quarries. Historical sites consisted of cemeteries, camps, cabins, farms, mines, trails and features associated with railway construction. Several types of historical site are known from single occurrences. This includes a Hudson's Bay Company post, grist mill, town site, school, jail, corral, bridge and an industrial site. Trails have been recorded as historical sites, but most likely originate prior to AD 1846 (Copp 1998d, e; 1999h, i, k; 2000a: Hudson 1996) and were capitalized upon by Eurocanadians.

Figures 4.1 and 4.2 illustrate the spatial location of selected site types. There is a distinct prevalence of sites within lowland areas due to research bias. This is a function of the greater emphasis of past surveys within such areas and the result of government requirements that the forest industry conduct archaeological overview, inventory and impact assessments in these areas because of the high probability for sites.

By conducting a database search of individual site locations, it was possible to construct a data matrix of Borden designation units measuring two degrees latitude by four degrees longitude within traditional Similkameen territories. Table 4.6 documents the 29 Borden units recording archaeological sites. These spatial distributions are a clear indication of the number of lowland valley sites recorded, with mid– to high elevation sites rare compared to the sites along the Similkameen and Ashnola Rivers. This shows that statistical analyses of site distributions within traditional Similkameen First Nations territories should not be attempted for mid to higher elevation areas, particularly south of Keremeos to the border, or north and east of the Princeton basin, given the paucity of surveys in these regions. In an effort to counteract this situation, a model has been developed for examination of these under–represented areas.

Table 4.6: Known Site Distributions by Borden Unit

Unit	N	Pre–Contact	Trad Use*	Historic	N%	Pre–Contact	Trad Use*	Historic
DgQw	7	7	0	0	1.7%	2.0%	0	0
DhQw	34	28	7	0	8.4%	8.1%	10.1%	0
DhQx	24	21	3	2	5.9%	6.1%	4.3%	18.2%
DgRa	29	29	7	0	7.1%	8.4%	10.1%	0
DgRb	16	12	3	1	3.9%	3.5%	4.3%	9.1%
DgRc	1	0	1	0	< 1%	0	1.5%	0
DgRd	1	0	1	0	< 1%	0	1.5%	0
DgRe	1	1	0	0	< 1%	< 1%	0	0
DgRg	18	17	3	2	4.4%	4.9%	4.3%	18.2%
DhRa	24	21	1	2	5.9%	6.1%	1.5%	18.2%
DhRd	10	6	4	0	2.5%	1.7%	5.8%	0
DhRe	3	1	2	0	< 1%	< 1%	2.9%	0
DhRf	2	0	2	0	< 1%	0	2.9%	0
DhRg	9	0	9	0	2.2%	0	13.0%	0
DiRa	32	28	4	0	7.9%	8.1%	5.8%	0
DiRb	34	32	3	2	8.4%	9.2%	4.3%	18.2%
DiRc	66	64	3	0	16.2%	18.4%	4.3%	0
DiRd	36	36	2	0	8.8%	10.4%	2.9%	0
DiRf	2	0	2	0	< 1%	0	2.9%	0
DiRh	1	0	1	0	< 1%	0	1.5%	0
DjRc	7	7	0	0	1.7%	2.0%	0	0
DjRd	23	23	0	0	5.7%	6.6%	0	0
DjRe	4	0	4	0	1.0%	0	5.8%	0
DjRf	1	1	0	0	< 1%	< 1%		0
DkRa	2	1	1	0	< 1%	< 1%		0
DkRb	6	5	1	5	1.5%	1.4%		45.5%
DkRd	5	5	0	0	1.2%	1.4%		0
DlRd	7	2	5	0	1.7%	< 1%		0
DlRe	2	0	0	2	< 1%	0		
	407	*347*	*69*	*11*				

- Traditional use is based on ethnographic records and informant data

Predictive Modeling

Predictive models are required for researchers conducting archaeology, especially those involved in the forest industry. Forest company wood lot areas are extensive, often covering tens of thousands of hectares. Individual cut–blocks within these areas can range in size from less than a single hectare to hundreds or thousands of hectares. The average size of a cut–block is usually 40 to 60 hectares in size. It would be prohibitively expensive for forest companies to be required to have each cut–block systematically surveyed as an impact assessment project. Instead, models are employed that provide the forest companies with a probability estimate for archaeological resources. This is an overview assessment. Through the implementation of overview assessments, forest companies and archaeologists tend to reach consensus concerning how much fieldwork is required in specific areas over a specified time period. Although some First Nations' would prefer to have all areas surveyed, this is impractical as the forest companies are unwilling to commit funding for such large–scale projects, especially since recent research has indicated most forest company cut–blocks fall within low archaeological site potential areas, verified through impact assessments that include invasive sub–surface testing for sites.

Archaeological research in the Similkameen Valley for the last 20 years has been driven by cultural resource management, not academic, requirements (ARCAS 1997; Eldridge and Mackie 1993; Equinox Ltd 1996). In many ways this parallels the situation in Washington State where the focus of fieldwork has been river–oriented surveys and impact assessments mandated by hydro–electric power projects in the Wells, Chief Joseph (Rufus Lake), and other Columbia River reservoirs. The result has been an intensive focus on areas within two kilometers of rivers, usually areas impacted by dam pondage. Far less emphasis has been placed on investigation of upland areas, especially in the Columbia Plateau (Chatters 1995; Lohse and Sprague 1998: 17–26).

Research in upland closed canopy forests has often been considered to be of less archaeological value than lowland valley projects due to economic and logistical factors. Lower elevation open canopy forests and river valley bottomlands provide good information at low cost, but ethnographic information indicates that Similkameen and other Aboriginal peoples utilized all bio–ecological zones. As such, upland areas must also be investigated to provide representative data necessary for incorporation into a culture historical sequence, as well as to address questions of culture process. The few upland sites currently known consist primarily of rare open sites, isolated lithic finds, culturally modified trees, historical mines and Gold Rush era trails. This is due to the fact that survey areas, as defined by the industries involved, have rarely included landforms known, or predicted, to contain pre–contact short or long–term occupations (variables are discussed below). Implementation of cultural resource management projects must then depend heavily on predictive site models, none of which existed until the mid to late 1990s.

The development of a predictive model for archaeological sites located within the traditional territories of the Similkameen First Nations rests upon two *prima facie* assumptions:

- human behaviour is non–random; *ergo* human use of the landscape will have been non–random throughout the past, and
- past patterns can be understood through study of dependent and independent variables that may also explain land use patterns.

Predictive models require testing through ground–truthing surveys. Survey results are assumed to be representative samples of larger regions (Bettinger 1980; Jochim 1976; Kohler and Park 1986; Kvamme 1985) even though sample sizes may be extremely small (i.e. < 1% of the landscape).

Table 4.7 illustrates changes in predictive model variables utilized for this research prior to 2002. Utilization of the variables listed above allows managers to more accurately predict site patterns across the landscape (horizontal distributions) in the form of sites manifested by visible surface features and artifacts. It also helps to determine areas where sub–surface evaluative testing should be implemented to locate buried cultural materials. Similar variable definitions and conclusions have been the result of projects oriented towards predictive modeling in the southern Fraser and Northern Columbia Plateaus (see Table 4.8).

Archaeological Site Predictive Variables. Table 4.9 lists predictive variables used to determine site potential values. Values in the right column are arranged from highest to lowest predictors in most cases. Practical results of the model provide the following general conclusions. Residential sites are, with few exceptions, located in river valley bottomlands. Independent predictive variables include:

- proximity to reliable sources of water;
- slopes less than 10 degrees or greater than 70% (lithic sources);
- generally south–facing aspect;
- location on peri– and para–glacial terrace landforms; and
- proximity to ridges and canyons providing access to mid– and upper elevation bioresource areas.

Table 4.7: Evolution of Predictive Model Independent Variables

	1997	1998	2002
Slope	< 20 degrees	< 20%, > 70%	0–10% and/or > 70%, 10–20%, 20–30%
Water, proximity	500–1000m	< 1000m, < 500m, S1–S6	< 1000m, 500–1000m, < 500m
Topographic feature type	Terrace, lake, stream	Terrace, riparian zones, mountain tops and ridges	Glacio–fluvial–lacustrine, Riparian zone, Montane
Confluence	Stream, River		< 500m
Aspect	South, East	South, East	South, East, variants
Access	Roads	Roads, trails	Roads, trails, game trails, ridges, helicopter, horse access
Elevation		Relative	Relative bio–ecological zone
Bio–ecological zone		Determined	Determined and relative to other variables including soil type and depth of sediments
Palaeoenvironments		Estimated	Estimated relative to other variables: post–glacial, mid–Holocene, later Holocene
Bio–resources		Database, traditional use	Database, traditional use (flora and fauna)
Insolation		Relational	Relative to bio–ecological zone and topographic feature
Known site proximity	Recorded	Recorded; traditional use, sacred use, trails	Recorded, unrecorded; traditional, sacred use, trails
Settlement patterns		Historic, traditional, pre–contact	Post AD 1811–1858, Proto–historic, Pre–contact: Late (150–2500 BP) Middle (2500–6000 BP) Early (> 6000 BP)
Disturbance	Erosion, land alteration, stream diversion, etc.		Erosion features; industrial (forestry, mining), ranching, farming and residential impacts

Logistical–staging (short–term) sites are located at all elevations. Mid– to upper elevation site locations can be predicted upon the following variables:

- proximity to permanent or seasonal sources of water (lakes, tarns, ponds, marshes, rivers, creeks, springs and seeps);
- steeper slopes (< 20 degrees) relative to residential camps;
- generally southward–facing aspect although less frequently oriented in other cardinal directions;
- tendency towards open forest canopy conditions;
- proximity to meadows, swamps and open sub–alpine to alpine areas;
- proximity to game or access trails; and

- proximity to lithic and bio–resource sources.

Table 4.8: Relevant Plateau Predictive Modeling Projects

Area	Reference	Independent Variables
Okanogan Highlands	Mierendorf et. al. (1981)	Ethnograhic data, landform type, known sites: type/location, bio–resources, seasonality of use/occupation, elevation, fuel, shelter, water, lithics.
Methow Valley	Fulkerson (1988)	Ethnographic data, known sites: type/location, seasonality of use/occupation, bio–ecological zone, elevation
British Columbia	Eldridge and Mackie (1993)	Critique of probabilistic and intensive surveys: landform type, bio–resources, bio–ecological zone, known sites: type/location, trails, sample unit type/size, mapping scale, and research designs to 1993 in British Columbia Plateau and Coastal regions.
British Columbia	Equinox Research (1996)	Critique of overview assessments: ethnographic data, known sites: type/location, bio–ecological zone, site preservation/visibility, water, slope, aspect, lithics, bio–resources, landform type, forest cover, access, and landform stability and research designs to 1996 in British Columbia Plateau and Coastal regions.
Okanagan Timber Supply Area	ARCAS (1997)	Ethnographic data, known sites and trails, bio–ecological zone, landform type (including mountain passes and rock outcrops), water (standing, including falls), slope, and bio–resources (ungulate winter range, fish traps/weirs)

Predictive Modeling Results

Of the predictive model variables discussed previously, the three most important generally are slope (0–20% and 80–100%), topographic feature (terrace or montane variables) and proximity to water. A ten point potential rank scale is used as required by provincial overview assessment requirements (Table 4.10).

The highest site potential area is the Similkameen River bottomlands (Ponderosa pine–bunchgrass zone) as well as larger upland (alpine) lake and riparian areas and including some high elevation ridges and knolls. This area is referred to as Zone 1 in a numeric system. The second highest site potential zone includes secondary drainages like the Ashnola River system, especially on terraces flanking the river. These generally occur within the Interior Douglas fir, Montane spruce and Englemann spruce–subalpine fir zones and comprise Zone 2. Upland minor drainage systems form Zone 3 where there is also potential for sites associated with ridges, knolls, mountain peaks, talus slopes and other upland features associated with archaeological sites. A site rated with moderate (medium) site potential in the second ranked zone receives a code of 2.1 with a numerical value of 5 (Table 4.11).

Table 4.9: Site Predictive Variables (2004)

Slope	1st: 0–10% and/or > 70%, 2nd: 10–20%, and 3rd: 20–30%
Water, proximity	1st: < 200m, 2nd: 200–500m, 3rd: 500–1000m, 4th: > 1000m
Topographic feature type	Glacio–fluvial or lacustrine river terraces, Riparian zones: marshes and ponds, Montane features: mountain tops, tarns, ridges and knolls
Fluvial Confluence	< 500m
Aspect	South, East and variants
Access	Roads, trails, game trails, ridges, helicopter, horse access
Elevation	Relative to bio–ecological zone
Bio–ecological zone (Relative to other variables including soil type and depth of sediments)	1st: Ponderosa pine–Bunchgrass 2nd: Alpine (near tree line and higher) 3rd: Interior Douglas Fir 4th: Montane spruce 5th: Englemann spruce–subalpine fir
Palaeoenvironments	Estimated relative to other variables: post–glacial, mid–Holocene, and later Holocene
Bio–resource availability	Database, traditional use (flora and fauna)
Insolation **(solar exposure)**	Relative to bio–ecological zone and topographic feature
Known sites (proximity)	Recorded, unrecorded; traditional, sacred use, trails
Settlement patterns **(ethnographic analogs)**	Historic (pre– AD 1858) Protohistoric, Pre–contact: Late (150–2500 BP) Middle (2500–6000 BP) Early (>6000 BP)
Disturbance factors	Erosion features; industrial (forestry, mining), ranching, farming and residential impacts

Table 4.10: Site Potential Rank Scale

#10	Burials, Rock art and other culturally sensitive features
#9	High
#8	High–Moderate
#7	High–Low
#6	Moderate–High
#5	Moderate–Medium
#4	Moderate–Low
#3	Low–High
#2	Low–Medium
#1	Low–Low

Table 4.11: Site Predictor Rank Values

H.1	Highest value – highest potential zone	value = 10
H.2	High value – high zone	value = 9
H.3	High value – medium zone	value = 8
H.4	High value – lowest zone	value = 7
M.1	Moderate value – high zone	value = 6
M.2	Moderate value – medium zone	value = 5
M.3	Moderate value – lowest zone	value = 4
L.1	Low value – high zone	value = 3
L.2	Low value – medium zone	value = 2
L.1	Low value – lowest zone	value = 1

Methodology: Inventory and Field Reconnaissance

Field reconnaissance methodology consisted of the following:

- systematic pedestrian traverses over land forms with slopes of 20 degrees or less,
- pedestrian traverses spaced no more than 10 to meters apart on suitable landforms, ,
- control distances and bearings established using compass and hip chain and/or Garmin 76 GPS unit,
- tie points of forest cut block corners marked in the field, if available,
- surface cultural materials and features marked with plastic flagging marked so as not to cause confusion with standard forest flagging codes,
- all flagged materials and features mapped to 1:5000 scale or better,
- subsurface exposures examined for evidence of buried cultural materials,
- subsurface shovel testing of minimum 40 by 40 cm units excavated in arbitrary ten centimeter levels to sterile substrates, depending upon state of preservation and depth of sediments,
- sediments to be hand–sorted, and
- shovel tests from a stratified sample of landforms judged to have ***high*** potential for subsurface archaeological materials; terraces, knolls that may have served as strategic viewpoints, riparian zones, and gently sloping areas within 500 meters of streams, rivers, lakes and ponds.

Problems Inherent in Current Methodologies. Predictive site modeling has experienced great strides in the last decade. A major problem remains the prohibitive cost of appropriately scaled paper maps (i.e. 1:20,000 scale TRIM) displaying required variables for fine scale analyses unless provided by a contractor. Unlike the United States, digitized map information suitable for Geographic Information System (GIS) analysis remains prohibitively expensive. Archaeological overview and inventory projects covering large areas remain constrained by 1:50,000 scale map sheets. Predictive accuracy suffers as a result. Due to the map scales available, ground–truthing remains an absolute necessity in the determination of archaeological potential for any given area. Regardless of map scales used, archaeological sites can be quite small – on the order of several meters square, or less, thus making ground–truthing and sub–surface testing mandatory.

Significant changes in microenvironments and predictive variables have been observed even with 500 m^2 quadrats at scales of 1:2500. As such, pedestrian observation provides the best confirmation of any model. Less exact, but practical are aerial overviews by helicopter or vehicular inspection from forest access roads.

Site recording should include the use of accurate GPS hardware and software. This technology is now standard for the forest industry and should be for archaeology. Cost for hardware and software has recently been alleviated. A combination of GPS and older compass and hip chain measuring techniques has been found to satisfy forestry companies and government ministries, especially when GPS units fail due to lack of satellite coverage – a ubiquitous problem in the Similkameen Valley. Another practical problem observed are inaccuracies in data plotted on maps, regardless of scale. This is due to errors in photo interpretation in the production of original maps and a lack of ground–truthing where cultural features (roads, trails, tracks) have been estimated. GPS ground–truthing is necessary, especially when historic trails have been inaccurately plotted, as encountered in the Whipsaw Creek Archaeological Inventory Study (Copp 2000c), in the Southeast and Southwest Upper Similkameen Archaeological Overview Inventory studies (Gould 2001a), during the B.C. Gas Inland Pacific Connector project (Prager et al. 2004) as well as for the Ashnola River overview (Copp 2003b).

Refinements to the model now require statistical and GIS analyses. Both were beyond the scope and funding of the projects described above. However, GIS technology coupled with powerful software can handle multiple independent variables and apply model decision rules to the resulting surface and should be used in future projects.

Predictive Modeling: Theoretical Concerns

The ethnographic Plateau pattern of semi–sedentary winter pithouse or mat lodge villages based upon stocks of dried and stored foods (roots, berries, meat and fish) is implicitly invoked in recent overviews of the last 2,000–4,500 years of Plateau prehistory (Ames et al. 1998; Chatters and Pokotylo 1998; Pokotylo and Mitchell 1998). Although the Fraser and Columbia Plateaus enclose an extremely large area of the Pacific Northwest, characterized by wide physiographic, bioecological and ethnolinguistic variation, there is general agreement that a collector strategy developed from earlier forager strategies (*sensu* Binford 1980).

Ethnographic and late pre–contact Plateau cultures have been characterized as hunter–gatherer– fishers employing foraging subsistence strategies. Archaeological data presented in this thesis indicates pre–contact Similkameen patterns emphasized hunting and gathering over fishing. Hunters and gatherers are generally defined by a lack of storable surpluses, whereas collectors store foods (Binford 1980). Both systems display different logistical strategies – hunters and gatherers practice an *immediate–return* strategy whereas collectors display *delayed–return* strategy (cf. Woodburn 1982).

Plateau collector strategies are marked by semi–sedentary to sedentary villages based upon storable resources (dried meat, fish and roots). Archaeological indications of collector strategies include:

- the presence of semi–subterranean pithouse or mat/skin/rush lodge domestic structures occurring singly or in small clusters;
- storage facilities (i.e. cache pits in house floors, external to houses, talus pits or above–ground racks);
- a logistically–mobile subsistence strategy sometimes with an emphasis on fishing; and
- where storable food surpluses are considered a primary factor leading to the development of ascribed and/or inherited status with sumptuary icons present in better families by ethnographic times. Floral and faunal species are considered to have been primary storage foods. Riverine resources included anadromous salmon in Columbia–Fraser watersheds as well as freshwater species and mussels.

This pattern is thought to commence ca. 4,000–4,500 BP. Prior to the development of a collector mode, earlier Similkameen subsistence and settlement patterns indicate mobile groups of hunter–gatherers focused on immediate–return foraging. This pattern is evident in the archaeological record by a lack of sedentary features (pithouses). Instead, logistical encampments were located along major watercourses with smaller camps and field stations in upland terrain.

Some Plateau researchers (Chatters 1984; Turnbull 1977; Wyatt 1970) sought to link the past 2,000–4,000 years to the ethnographic present by reliance upon the Direct Historic Approach, supplemented with lexicostatistical estimates of language group time depth in order to estimate linkages between the ethnographic and pre–contact eras. Campbell (1990) specifically cautions against using the early historic pattern as a template for pre–contact cultures because of severe population and cultural dislocations.

Bettinger (1991: vi–vii) provides a middle view, stating "there is no clear distinction between archaeology and ethnology as regards either theory or subject matter ... hunter–gatherer archaeologists (cannot) afford to ignore anthropological theory and theorists and the ethnographic record." Kelly (1995: 338) suggests, that while specific cultural patterns may not be predicted back into the past (i.e., using the Direct Historic Approach), general cultural patterns typical of hunter–gatherers in diverse or changing environments can be understood through analysis of the archaeological record. As such, applying ethnographic knowledge to the past 2,000 or 4,000 years in the Similkameen may not be justifiable in the particular, but as a generalized pattern to which analogous behaviours may be linked. This conclusion is supported by Winterhalder (2001: 13) who derived four generalizations common to hunter–gatherers: 1) subsistence levels below biomass capabilities and lack of accumulation of material goods; 2) generalized reciprocity of resources, especially food; 3) egalitarianism; and 4) some form of gender–based division of labour. All would seem typical of Similkameen hunter–gatherers over the last 8,000 to 10,000 years of the archaeological record.

Hunter–gatherer (Immediate–return) Modes

Differences between forager and collector–type adaptive strategies have served as a focus of research of Plateau cultural origins over the last two decades. So much emphasis has been placed on this, with regard to models of cultural development, that a review of the forager–collector continuum is necessary. The theoretical basis for hunter–gatherer and hunter–gatherer–fisher settlement and subsistence strategies has focused on locales where ethnohistoric and contemporary populations practicing such patterns exist (cf. Hayden 1992). The relative degree of seasonal climatic change expressed in terms of temperature and insolation, as well as environmental diversity, correlates strongly with differing adaptive strategies. Binford's (1980) analysis concluded that hunter–gatherers develop an increasing emphasis on storage relative to seasonal availability and quality of available bioresources.

Hunters and gatherers living in low biomass areas must, of necessity, re–locate residential sites on a frequent basis if storage is not practical, or not practiced for cultural reasons. Foraging becomes a regularly scheduled activity by which residential bases must be moved when localized resources become depleted. Hunters and gatherers tend to inhabit areas exhibiting sufficient biomass for survival even though they may not extract all available resources. Ethnographic records for the Sinkaietk (south Okanogan) for example, record a tendency not to exploit certain mammalian, fish, shellfish, root and berry resources unless malnutritive stress was experienced (Post 1938: 29). Pre–contact Okanagan–Similkameen settlement patterns occured within a resource catchment area centred at a residential camp similar to the Methow. Storable protein was generally lacking in the Simillkameen due to the non–occurrence of anadromous salmon in the Canadian watershed as previously noted.

Generally, Similkameen strategies would have included a preferred procurement–predation strategy defined as an *encounter* pattern (Binford 1980) or an immediate–return (Woodburn 1982) strategy. Both are noted for flexibility, especially in areas with fluctuating resource availability due to vagaries of climate, season and local terrain. The encounter pattern should not be confused with opportunistic foraging. Rather, it is a highly predictive strategy based upon knowledge of local environments, plant and animal reproductive cycles and animal behaviour because the territory has a resident population familiar with the variables that determine resource availability. However, if a resource should fail for any reason it will be replaced regardless of whether the "new" resource (or an old one that becomes increasingly valued) requires greater effort in procurement and/or processing. Plateau hunters and gatherers may decide not to capitalize on all available resources (Cline et al. 1938), their strategy involved "starvation foods" that were not eaten except in times of stress. The prohibition of certain foods may be the result of ceremonial restrictions, such as those associated with womens' menses and/or for spiritual spiritual activities.

An example of encounter foraging is that of Bighorn sheep hunting by the ethnohistoric Similkameen (Teit 1930). Hunters wishing to procure sheep may fail for a number of reasons; the sheep may not be in the locale predicted, they may see the hunters and flee, the herd may be in an untenable position for hunting (i.e., on steep, rocky slopes), and the like. But, since sheep are often found near exposed rocky slopes, an environment favourable to marmots, the hunters may simply shift their focus to such smaller game.

Archaeological correlates of foraging strategies include residential (base) or logistical field camps of relatively small size and limited duration of occupation. Base camps are usually subsumed under the rubric "occupation" site. They represent a focus for multi–purpose task–oriented groups who use the camp as a locus for task preparation. Some tasks take place away from camp, but task groups return daily or longer depending upon proximity to resources. Both types of sites often lack many features of villages. They may lack intact hearths, housepit depressions, cache pits, post–holes and the like. Residential camps offer short–term temporary or seasonal shelters, but generally lack storage facilities. Non–field camp (i.e., non residential) sites include "station" sites (Binford 1980) where extractive activities (kill sites, plant collection, lithic quarrying, etc.) take place. Materials procured at a station are either consumed immediately or taken back to the field camp for distribution, usually among reciprocating kin and camp partners. Additional sites should include a plethora of non–subsistence sites such as burials (including cairns), petroforms, pictographs, petroglyphs and access routes, or trails.

The distribution of residential camps is a function of the availability of valued resources and distance. In the Similkameen, this is characterized by a settlement pattern of multiple residential camps located at strategic foci throughout a territory. These camps are found in situations that allow access to a multitude, rather than a restricted number, of resources.

Information gleaned from Similkameen elders and/or experience, allowed for the development of cognitive maps of the territory, including information that settlements varied according to seasonal, bioecological or culturally determined zones (Copp and Gould 2000; Gould 2001a). "Mapping–on" is the term used to define this type of pattern where hunters and gatherers remove to resource locales. Conversely, collectors practice "logistical" moves where resources are gathered/collected and then transported to a residential camp. This pattern does not exclude resource procurement forays of several days' duration, especially for hunters engaged in uplands predation. This was likely the pattern in the Similkameen as most recorded camps are located in valley bottom lands, surveys in forested areas generally have not been successful in locating hunters' camps, except in strategic locations near the tree line. Evidence for distance hunting may be observed in disproportionately low levels of faunal skeletal element preservation in base camps, with larger, less useful elements discarded at the kill/butchering site. Since a number of tasks are undertaken within a residential camp, there is an assumed correlation between the number of tool types recovered and economic strategy. This is the case for all Similkameen sites examined to date (see Appendix A) where field and residential camps exhibit low tool type inventories.

Hunter–gatherers practicing foraging subsistence strategies, by necessity and often by choice, are highly mobile. As such, it is expected that groups travel with minimal material culture inventories and manufacture expedient tools rather than curate more formal tool types. This is a pattern common to many hunter–gatherers, including pre–contact Athapaskans. An analogy may be made between modern campers who travel in motorized homes complete with colour television, microwave and portable power units as opposed to minimalist backpackers and extreme archaeologists (e.g., Reimer 2000) who must carry necessities on their backs. Pre–contact Similkameen hunters and gatherers appear to have been hyper–minimalists in terms of archaeologically visible equipment they were willing to carry, since almost all tools and features could be manufactured at the field camp out of locally available raw materials. It is for this reason that residential and larger field camps should be located primarily along river bottomland areas with smaller encampments being the norm at higher elevations. Hunters and gatherers tend to resist change according to assessment of risk. This pattern is considered highly adaptive as long as the resident population can survive by being mobile, allowing the pursuit of encounter strategies.

Hunter–gatherer–collector (Delayed–return) Modes

The collector adaptive strategy is one in which sedentary, or semi–sedentary, populations reverse the process of resource procurement relative to hunters and gatherers. Instead of locating occupations in proximity to relatively few scheduled resources, collectors are more logistically organized. This means that they extract and/or process resources as task groups from a source area and then transport them to a base (residential) camp for more processing and/or consumption (Binford 1980). In other words, they take the resources back home as a delayed–return strategy (Woodburn 1982). These activities produce characteristic storage features such as cache pits and storage racks. Storable foodstuffs in the Plateau were often dried and hung from structural supports in the interiors of pithouse or mat lodge dwellings. Collectors are perceived as more specialized in exploitative strategies than hunters and gatherers. This implies a greater efficiency of resource use through more intensive use of r–type species such as fish that can be dried and preserved for winter. A reliance on winter stores decreased time required for active procurement of foods through hunting, although some hunting most likely continued to supplement winter stores. Winter was also the time for cultural pursuits ranging from the development of non–subsistence related crafts (music, dancing and other visual or performing arts) and artifacts could serve as sumptuary items associated with increased levels of social stratification (Hayden 1990, 1992).

Collector activities also resulted in a changed settlement pattern. The focus of the settlement became the permanent or semi–permanent nucleated village characterized by numbers of pithouse or mat lodge domestic structures occupied contemporaneously by larger aggregate populations than exhibited by the preceeding forager patterns. Additional site types include the field camp – a locus of activities associated for logistically organized task groups that included a short–term residential function. Procurement locations (Binford's "stations") represent specialized non–occupation sites associated with extractive and/or initial processing of raw materials such as kill sites, quarries, root and berrying grounds, ambush and scouting locales. Other non–habitation sites include special sites for ceremonial/cultural activities such as petroforms, pictographs and petroglyphs. Trails are another important site type that fall outside Binford's residential–field camp versus station dichotomy although he does include the category "transitory camp" associated with access routes (for examples see Copp 1998b; 1999b, c, h; 2000a, c). Caches are locales for the temporary or long–term storage of food or material culture items and may take the form of cache or talus pits, stone cairns, or other petroform structures in the Plateau.

Due to the tendency of hunters and gatherers to move to resource locales, there is a strong correlation between residential sites and seasonal–spatial resource distribution. High mobility strategies indicate that hunters and gatherers could only afford to capitalize on a few resources situated in proximity to the residential camp until depleted, and then move on to another area as required. Hunters and gatherers with low population densities and subsistence strategies which do not maximize the potential carrying capacity of the environment (cf. Yellen 1977) would thus be expected to leave smaller, less visible sites in the archaeological record.

Collectors, whose residential mobility results in base camps where activities such as resource processing and distribution take place, also experience net population growth to match the level of the increased carrying capacity that results from a more efficient exploitation of resources. As such, collectors leave behind larger sites that have been occupied for longer periods and are thus more visible in the archaeological record. Collector residential sites are expected to be found in proximity to a larger number of actual, or potential, resources undergoing exploitation, demand site locations that reflect compromises among different resource procurement strategies (risk), compounded by basic occupation site requirements, such as access to water, shelter and fuel. Social factors may predicate the location of residential sites as well, due to factors such as access to trading locales and seasonal social gatherings where products may be exchanged and social ties among trading partners developed or renewed. Larger seasonal social aggregations of population at fishing sites or winter villages also allow for the development of inter–group kinship affiliations (affinal ties) so necessary for macro–community survival through reciprocal exchange of offspring by marriage.

Residential camp infrastructure features associated with dwellings include a number of material items that require intensive levels of preparation. These include procurement and manufacture of large and small structural support poles, bindings, and woven mats. Variations in mid–Fraser River drainage dwelling structure may be correlated with single versus multi–family dwellings and/or intensification of social stratification hypothesized by Stryd and Lawhead (1978: 14) and verified by later work (Hayden 1997: 242; Hayden et al. 1996: 151–164). In addition, village residential bases correlate with larger site areas and intra–community structural patterns than those of field camps where more limited occupation activities were practiced.

The archaeological visibility of storage systems may not always be evident in material features such as caches. Ethnographic evidence (Teit 1900, 1930) indicates that salmon were procured and processed by drying in close proximity to the source (fishing and processing stations), but were not necessarily stored in below or above ground structures constructed for this purpose. Rather, they were hung from the cross–member roof supports of pithouses, and presumably mat lodge dwellings, along with other items of use. It is not therefore surprising that no cache pits have been recorded in Similkameen village sites, given the lack of local availability of salmon that was not transported into the valley from points south.

Storage strategies need not be restricted to collectors, they also can be practiced by hunters and gatherers. It is the degree of storage which marks the difference between collector and forager adaptive strategies, not the presence or absence of such features. Storable foods free consumers from the seasonal constraints of resource availability to a greater or lesser extent, depending upon the nature of the resource, relative availability and quality. For example, salmon procured along the lower and middle Columbia River were, and are, in better shape than those traveling further upriver into the upper Columbia and Okanagan river systems, as they retain much of their stored fat. Quality, measured in terms of muscle tone and levels of oils and fats, decreases with distance from the ocean, thus dried salmon obtained in the Okanogan and southern Similkameen systems have less nutritive value than those obtained downstream.

In the northern Columbia Plateau, storage systems associated with semi–sedentary villages were partially predicated upon seasonal runs of anadromous salmon, as well as more traditional winter hunting, until bulk processing technologies were sufficiently developed to allow full winter sedentism. Although salmon, as high protein foodstuff, were important provisions, so too were dried meat, roots and berries which often were made into pemmican which may remain edible over several seasons.

Mass food resource procurement also requires the development of specific, often complex, material culture items. Drive lanes, requiring coordinated group, have been associated with procurement of ungulates (deer and Bighorn sheep) in areas of the Cascade Range and other Plateau areas, for example. This also is the case in the fishing industry, where complex infrastructure features ranging from basketry traps and weirs for communal fishing, to individual equipment such as leisters, dip nets, hooks, sinkers and lines, are required. Thus, the material culture inventory of collectors would involve an increase in specialized material culture items associated with specific resources, as opposed to a primarily "expediency forager strategy" material culture inventory.

Once developed, large–scale storage systems would have contributed to decreased mobility associated with increased sedentism and the development of more complex cultures (see Hayden 1992 for the mid Fraser–Thompson River region as an example). Storage systems also reflect logistical organization in terms of the procurement of large quantities of more valued resources such as deer, elk, mountain goat or bighorn sheep. These may be obtained through seasonal communal hunts from seasonal residential camps or villages, to solitary stalks in all seasons. Collection of mass quantities of berries and roots suited to drying and mixing with animal flesh is reflected in the occurrence of grinding stones (handstones and mortars or hopper–mortars). Thus, one would expect to find an increase in the number of identified floral and faunal elements in sites, but a possible decrease in the number of taxa represented for collectors than hunters and gatherers (see Chatters 1984 for examples from the Wells Reservoir).

A major effect of increased efficiency in food preservation, and thus available quantities and quality of food per capita, would have been an increase in human population. Increased populations, efficient food storage, an emphasis on the production of non–subsistence material culture items, coupled with an increasing need for social patterns which determine behavioural norms, led to the development, or intensification, of social inequality and stratification as exemplified in the ethnohistoric record. Although relying heavily upon Binford's (1980) criteria, it should be noted that forager and collector strategies operate on a continuum and should not be considered mutually exclusive extremes. Binford (1980) provided a *caveat* in his discussion, stating that the forager–collector dichotomy represented a heuristic device for discussion and was not meant to be inflexible in discussions of adaptive strategies. Given the range of available resources across Plateau bioecological zones, differences in vertical zonation (i.e., low versus high relief areas), as well as idiosyncratic cultural behaviour, forager versus collector strategies should be considered as patterns practiced at many levels, with some sites representing evidence of hunting and gathering as well as incipient collecting strategies, rather than fixed competing strategies.

Working with a large database of sites and assemblages in the Wells Reservoir region of north–central Washington State, Chatters (1984) refined Binford's (1980) criteria for resource utilization tactics from a two dimensional, linear continuum into a multi–dimensional model. He defined behavioural variability dimensions for which resource utilization might be deduced from the archaeological record:

- group size (occupation area);
- duration and frequency of occupation;
- species utilization and intensification of ecological niche breadth;
- resource use planning;
- complexity and specialization of technologies, and
- variation in the use of implements facilities and features (Chatters 1984: 12).

He then developed a model by which forager versus collector strategies could be deduced from the archaeological record in terms of associations and degrees of intensity of the above factors and compared them to the known archaeological record as well as ethnographic Sanpoil–Nespelem culture.

Application of dimensional factors to site data associated with late Plateau cultural patterns (i.e. ethnographic analogy to the Sanpoil–Nespelem for sites dating less than 2,000 years old) accurately reflected measures of variation in seasonal resource exploitation patterns (*contra* Campbell 1985), although deductions regarding seasonal duration were inconclusive (Chatters 1984: 134). Chatters (1984: 131) admits that his assumptions about past cultural behaviour corresponding to ethnohistorically–recorded patterns are theoretically weak, but represent an attempt to correlate empirical archaeological data with models of resource exploitation patterns which are measurable and can be predicted empirically and tested against data from other areas. Not surprisingly, there are gaps in the data. Only two types of site were evaluated; early spring base camps versus winter/summer hunting camps and these were restricted to areas in proximity to major river drainages, not mid – to upland elevations. However, his analytical model and results are applicable on a general level for other Plateau areas, albeit those for which a detailed ethnographic record exists. Lacking ethnographic information, data from periods older than 2,000 years must be examined from a more generalized synthetic level of forager–collector analogies. Such is the case for the Similkameen.

The Problem of Sedentism in the Plateau

It is generally assumed that the development of sedentary features (e.g., mat lodges, pithouses, villages) is a function of storable surpluses. In the Plateau, the development of complex cultures has been equated with an economic reliance upon food species exhibiting specific r–type reproductive strategies. These have short reproductive cycles with many offspring, hence large numbers of storable items, such as freshwater and anadromous fish, shellfish and certain flora (Hayden 1990, 1992; Peacock 1998). There is evidence that a mixed subsistence economy based upon both r – (short reproductive cycle with many offspring) and K–type (long reproductive cycle with few offspring) resources may result in sedentism. For example, seasonal winter villages based upon stored roots have been postulated for a portion of the Methow River drainage on the eastern flank of the Cascade Range in north–central Washington (Fulkerson 1988), but only when combined with proximity to resident herds of deer. Similar mixed forager–collector strategies can be ascribed to the ethnographic Okanogan (Cline et al. 1938; Hill–Tout 1911; Teit 1930) and Similkameen (Bouchard and Kennedy 1984; Hudson 1990).

Chatters' (1989) evaluation of early pithouse structures in the Wells Reservoir area provides support to the notion that storage need not be a primary indication of sedentism. This is apparent in his Pithouse I period commencing ca. 4,500 BP. This period includes an initial development of seasonal villages based on broad–spectrum, mobile hunting and gathering strategies. The following Pithouse II pattern, dating after 3,500 BP, fits an expected collector mode based upon relatively less mobility and storage. It would appear that a multi–factoral model for sedentism is required rather than the general assumption that storable foods necessarily form the basis for changes in all forager to collector subsistence strategy settlement patterns (cf. Chatters 1984, 1989).

Chapter Summary

This chapter provides a summary of field research methods and theoretical concerns employed during data collection for the writing of this dissertation. Although there were problems and restraints concerning research designs and methods, the quality of information retrieved and temporal range of site components was sufficient to fulfill three goals:

1) construction of a culture chronology for the Similkameen Valley;
2) evaluation of the Plateau Microblade tradition; and
3) evaluation of data that might be used to determine past ethnic polities.

The information provided here and in Appendix A is a summary of 11 years of field research. Some research questions arise from this, specifically with regard to predictive modeling:

Predictive modeling should be conducted using 1:50,000 and 1:20,000 scale map sheets (*contra* Equinox Ltd 1996). Problems with 1:50,000 scale maps are discussed above. Research has indicated that 1:20,000 scale B.C. government TRIM maps provide more of the critical predictive variables including landform types, elevations, forest cover, hydrologic systems, faunal distributions and the like. Fieldwork should be conducted with hand GPS and computer–assisted mapping programs in order to increase accuracy of results. Maps are an essential part of predictive modeling. Recent software programs allow any scale of map, aerial and satellite photographs to be downloaded as bitmap files. Individual maps, or portions thereof, can then be customized and printed for low cost. Additional requirements for research conducted in heavily forested terrain such as those encountered in the research reported above are suggested, including:

sample quadrats consisting of no larger than 500 m^2 (25 ha) due to field survey difficulties associated with moderate to high relief in closed forest canopy areas. Sampling units can be determined from the existing 1000 m^2 UTM quadrats printed on both 1:50,000 and 1:20,000 scale maps, 500 m^2 quadrats be divided into 100 m^2 sub–quadrats (1 ha or 10,000 m^2) for increased sample representation, and overlays of GIS layers representing single or combined predictive variables be included. The areas predicted to have low, medium and high potential for archaeological sites can then be subjected to pedestrian ground–truthing for evaluation of the model.

Although the technique reported here is a computer–assisted technological advance over the hand–coloured map sheets of the past, the high costs of digital elevation data and appropriate software such as ARCVIEW generally prohibit use by smaller consulting firms. This was recently confirmed by research conducted in 2005–2005 by the Archaeology Department of the Upper Similkameen Indian Band for the forestry industry indicates Archaeological Overview Assessments (i.e., predictive modeling only) were charged out at a rate of $100,000.00 per watershed (Ortner 2006: 39–42). However, less expensive software such as Oziexplorer ™ and Oziexplorer3D™, combined with release of 1:50,000 NTS DEM files, makes plotting of sites much less expensive.

– CHAPTER FIVE –

SIMILKAMEEN CULTURE HISTORY

A primary goal of this thesis is the construction of a regional culture history. As indicated in Chapter 4, prior to 1993 archaeological research was narrowly focused on overview assessments without fieldwork and what fieldwork was conducted tended to be site surveys or very limited excavations. A number of field projects, oriented towards the recovery of data from which a culture history could be constructed, initiated with the first field season in 1993. Fieldwork conducted as archaeology field schools contributed the most valuable information for this goal as work focused on archaeological sites, single or multi–component, providing data at financial costs that could be borne by an educational institution with limited research funding capability. Community college faculty, unlike university–colleges and universities in Canada, are extremely unlikely to receive federal funding since two–year colleges are equated with high schools in terms of application ranking. As college field schools with crews of 20 to 30 or more have logistical needs (camping, food, transportation, access to emergency medical facilities, and the like), they focused on valley bottomland sites as upland (backcountry) site investigations were not logistically possible. Fortunately, valley bottomland occupation and short–term use sites also provided data for an evaluation of the Plateau Microblade tradition.

Although projects oriented towards construction of a culture history were funded by college endeavours (i.e., some college funds, but primarily based on fees charged to students), funding for the predictive modeling research goal had to be derived from the heritage consulting industry. These projects, mostly funded by forest companies, were undertaken by the author as a private consultant (Itkus Heritage Consulting) as this was more cost–effective than having "for profit" projects managed by college staff and administrators, especially since educational institutions require up to 20% of the contract as administrative costs. All projects reported in this thesis were conducted with the approval of the Upper and Lower Similkameen Indian Bands and included band personnel and representation.

The Similkameen Culture History Database

All sites in the following discussion have been excavated and tested for site significance by the author for the construction of a Similkameen culture history. Table 5.1 lists only those sites exhibiting diagnostic artifacts or features. Some sites tested are undated and have produced little in the way of diagnostic cultural materials with the notable exception of those recorded by Prager et al. (2004) during the Inland Pacific Connector pipeline project (see Appendix A).

There are only seven radiometrically dated archaeological sites in the Similkameen Valley and 14 radiometric assays: Cool Creek (DhQx–10); Stirling Creek Bridge (DiRa–09); Snazai'st Village (DiRa–20); Tcutcuwi'xa rock shelter (DhRa–02); Red Ants (DiRa–24), Red Bridge Camp (DhRa–13) and the Keremeos Burial (DhQw–15) sites. Table 5.2 lists sites and sample assays in chronological order calculated with CALIB Rev4.4. All samples were processed as Accelerator Mass Spectrometry (AMS) estimates from cultural ungulate bone samples, except for burnt soil from an historic hearth–like feature at Cool Creek (DhQx–10). This sample confirmed the historical nature of a feature associated with cultural materials typologically dated ca. 1,000–200 years BP. Sites of interest other than those listed in Table 5.2 are dated by typological means and are discussed in Appendix A.

Vivian (1992), working primarily in the mid– to upper Similkameen, and Salo (1987), working in the American part of the valley, summarized surface collected artifacts in the hands of private collectors. Both noted the presence of probable Windust Phase (> 8,000 BP) points. Other artifact collections observed by the author confirm these two researchers' estimates of a 9,000–year occupation span within the valley, with at least three Windust points so far noted for the Canadian Similkameen Valley to date.

Cascade Phase (8,000–4,500 BP) leaf–shaped point types are well represented in the northern Columbia Plateau, less in southern Fraser Plateau sites. An irregularly flaked dacite specimen was recovered (B. Gould, personal communication 2000) in a sub–alpine context alongside a trail on the divide between the Ashnola and Pasayten Rivers. This artifact was examined in the Upper Similkameen First Nation offices in October 2000. It exhibits characteristics of the three defined Cascade point types (Lohse 1985, 1995). Several other examples of Cascade points occur in surface and private collections (Vivian 1989b, 1992), as well as in excavations conducted by the author since 1995. Foliate (leaf–shaped) projectile points, although smaller than Cascade types, continue in Plateau archaeological sequences for at least two millennia after 4,500 BP, illustrating the difficulty of assuming cultural (ethnic) affiliation or ages based upon projectile point criteria alone.

A culture history of the Upper Similkameen Valley rests upon a small sample of radiometrically– assayed sites, all of which are multi–component. Again, Cool Creek (DhQx–10), Tcutcuwi'xa rock shelter (DhRa–02), Red Ants (DiRa–24) and Snazai'st Village (DiRa–20) were excavated on Reserve lands without benefit of an Archaeology Branch permit at the request of

Similkameen First Nations authorities. Tcutcuwi'xa rock shelter (DhRa–02) is of special concern as it is a sacred site exhibiting a large number of pictographs.

Table 5.1: Similkameen Sites

Site No.	Name	Site Type	Time Frame	Methodology
DhQw–35	Keremeos Burial	Found human remains	400 to 800 BP	Shovel and block excavation
DhQx–10	Cool Creek	Logistical camp	Historical, 200–2,500/ 4,500 BP	Shovel and evaluative tests
DhRd–04	Golddust Gravel Pit	Logistical camp	500–7,500 BP	Shovel and evaluative test
DhQx–10	Cool Creek	Logistical camp	200–4,000 BP	Shovel and evaluative tests
DiRc–67	Copper Mtn. Spring	Logistical camp	8,000–11,000 BP	Shovel test
DkRb–02	Link Lake	Logistical camp	200–1,500 BP	Shovel and evaluative test
DkRb–07	Chain Lake	Logistical camp	200–1,500 BP	Shovel and evaluative test
DiRc–66	Princeton Golf Club	Logistical camp	Post–contact, 200–7,500 BP	Shovel and evaluative tests
DiRb–01	Wolfe Lake	Residential–logistical camp	200–7,500 BP	Back dirt screenings
DiRa–09	Stirling Creek Bridge	Residential–logistical Camp	200–7,400 BP	Shovel and evaluative tests
DiRa–24	Red Ants site, IR #2	Logistical camp	500–8,000 BP	Evaluative tests
DiRa–20	Snazai'st Village	Winter village, residential camp	Post–contact, 200–4,000 BP	Shovel and evaluative tests
DhRa–02	Tcutcuwi'xa Cave	Rock shelter, Sacred site	200–4,000 BP	Evaluative tests
DhRa–13	Red Bridge Camp	Logistical camp	500–1,000 BP	Shovel and evaluative test
IPC–01 to 32	(various sites)	Post–contact mining camps, logistical camps	Post–contact, 200–8,000 BP	Shovel tests

Elders were concerned about excavations of this site, so much so that none visited during our excavations, but they were present during initial opening and final closing ceremonies. Multi–component sites [Cool Creek (DhQx–10), Stirling Creek Bridge (DiRa–09), Snazai'st Village (DiRa–20), Tcutcuwi'xa rock shelter (DhRa–02), Red Ants (DiRa–24) and Princeton Golf Club Springs (DiRc–66)] and single component sites [Copper Mountain Spring(DiRa–67), Golddust Gravel Pit (DhRb–04), Link Lake (DkRb–02), Chain Lake (DkRb–08), Red Bridge Camp (DhRa–13) and several sites located as a result of the Inland Pacific Connector project (Bussey et al. 2004), form the foundation for a culture history of the Similkameen valley.

Table 5.2: Radiometric Assays, Similkameen Valley

Site	Sample	Conventional Radiocarbon Age	Cal BP at 1σ (68%)*	Cal AD/BC at 1σ (68%)*	Probability Distribution
DhQx–10	Beta 183263	112.1 ± 0.56 pMC **			
DhQx–10	Beta 185396	130 ± 40 BP	0 – 290 ***	Cal AD 1804 – 1885 ***	0.495
DhQw–35	Beta 218919	640 + 40 BP	560–598	Cal AD 1352–1390	0.578
DhQx–10	Beta 185395	2,290 ± 40 BP	2,307–2,348	Cal BC 399 – 358	0.669
DhRa–13	Beta 168682	580 ± 40 BP	596 – 639	Cal AD 1311 – 1354	0.656
DiRa–20	Beta 145480	710 ± 40 BP	649 – 684	Cal AD 1266 – 1301	0.878
DhRa–02	NUTA 6677	1,130 ± 100 BP	953 – 1,148	Cal AD 802 – 997	0.947
DiRa–09	NUTA 4687	1,810 ± 90 BP	1,687 – 1,826	Cal AD 124 – 263	0.698
DiRa–20	Beta 145479	1,980 ± 60 BP	1,868 – 1,995	Cal BC 46 – Cal AD 82	1.000
DhRa–02	NUTA 6726	3,280 ± 150 BP	3,347 – 3,692	Cal BC 1743 – 1398	1.000
DhRa–02	NUTA 6727	3,580 ± 170 BP	3,683 – 4,091	Cal BC 2142 – 1734	0.930
DiRa–24	Beta 168683	4,750 ± 40 BP	5,503 – 5,583	Cal BC 3634 – 3554	0.733
DiRa–09	NUTA 4644	6,920 ± 100 BP	7,663 – 7,841	Cal BC 5892 – 5714	0.975
DiRa–09	NUTA 4645	7,400 ± 90 BP	8,157 – 8,332	Cal BC 6383 – 6208	0.873

* (Stuiver and Reimer 1993: 215–230)
** modern (mid–20th Century)
*** sample reported to 2 standard deviations

The primary item of material culture commonly used to determine regional chronologies for pre–contact hunter–gatherers is the projectile point. As the archaeological record for the Similkameen Valley consists primarily of logistical or residential–logistical camps of otherwise mobile foragers, a discussion of projectile points is necessary before discussing other cultural elements.

Plateau Projectile Point Chronologies

Tables 5.3 and 5.3 list known projectile points by type observed in collections, surface–collected or excavated from archaeological sites in the Similkameen Valley since 1992. Table 5.3 is a summary of point types until 1992, Table 5.4 (Appendix C) are additional points recovered by research reported here (see Appendix A). Similkameen points are compared with northern Columbia Plateau, including the Okanagan Valley, (Campbell 1985; Chatters 1984, 1986; Grabert 1968, 1970; Lohse 1985, 1995; and Vivian 1992) and the mid Fraser–Thompson and Nicola River regions (Richards and Rousseau 1997; Stryd and Rousseau 1996; Vivian 1992; Wyatt 1970) in Figure 5.5. Fine typological distinctions among Similkameen projectile point types were not attempted due to small sample size, although Lohse's (1985, 1995) analyses have increased identifiable diagnostic attributes of comparable materials.

Table 5.3: Similkameen Projectile Point Data (1992)

Type		Similkameen
1	Windust C	2
2	Cascade C	26
3	Cold Springs	5
4	Mahkin Shouldered	4
5	Lehman Oblique	3
6	Lochnore Side–notched	1
7	Shuswap 1,2,8	absent
8	Shuswap 3,4	4
9	Shuswap 5	4
10	Nespelem Bar	24
11	Rabbit Island A	18
12	Columbia Corner–notched A	6
13	Quilomene Corner–notched	29
14	Quilomene Basal–notched	5
15	Wallula Rectangular Stemmed	absent
16	Columbia Corner–notched B	absent
17a,b	Plateau Side–notched	10
N		**141**

Lohse's research has also indicated that many etically–defined types exhibit a wide range of morphological variation. Varying point size may be due to a combination of variables including, but not limited to; knapping skill, raw material type, idiosyncratic concepts of style on the part of the manufacturer, and the like as well as type of weapon system (i.e., atlatl versus bow and arrow) across time. As a result, the temporal position of non–radiometrically dated materials cannot be determined solely upon typological traits, given the wide temporal span of similar point types across the Plateaus. Rather, associated artifacts and features must also be considered where possible, as well as proximity to areas with reported types.

Table 5.5: Plateau Projectile Point Types, Temporal Distributions

	Columbia Plateau	^{14}C min	^{14}C max	Thompson–Fraser Plateau	^{14}C Min	^{14}C max
Type 1	Windust C	8,000	11,000	Plano	8,000	10,000
Type 2	Cascade A,B,C	4,000	10,000	Leaf–shaped Lanceolates	3,000	8,000
Type 3	Cold Springs Side–notched	3,500	7,000			
Type 4	Mahkin Shouldered	3,500	8,000	Shouldered Lanceolates	4,000	9,000
Type 5				Lehman Oblique–notched	4,000	6,000
Type 6				Lochnore Side–notched	3,500	5,500
Type 7				Shuswap Horizon 1, 2 and 8	2,500	4,000
Type 8				Shuswap Horizon 3 and 4	2,500	4,000
Type 9				Shuswap Horizon 5	2,500	4,000
Type 10	Nespelem Bar	3,000	5,000	Shuswap Horizon 7	1,500	3,000
Type 11	Rabbit Island A	2,000	4,000	Shuswap Horizon 6 and 7	2,400	2,800
Type 12	Columbia Corner–notched A	2,000	4,000	Corner–notched variants	1,200	2,000
Type 13	Quilomene Bar Corner–notched	2,000	3,000	Corner–notched variants	1,200	2,400
Type 14	Quilomene Bar Basal–notched	1,500	2,500	Basal–notched variants	300	2,000
Type 15	Wallulla Rectangular Stem	200	2,000			
Type 16	Columbia Corner–notched B	150	2,000	Corner–notched variants	1,200	2,000
Type 17a	Plateau Side–notched	1,500	2,000			
Type 17b	Plateau Small Side–notched	150	1,500	Kamloops Horizon Small Side–notched	150	1,200

Eighteen projectile point types, from a sample size of 217, are defined in this study (see Appendix A for figures). Defined types are primarily in accord with criteria defined by Lohse (1985, 1995). Two types, the Cold Springs Side–notched and Wallula Rectangular Stemmed, are exclusive to the Columbia Plateau and Okanagan–Similkameen area whereas five Thompson–Fraser Plateau types (Lehman Oblique–notched, Lochnore Side–notched, and Shuswap Types 1, 2, 3, 4, 5 and 8) occur in the Similkameen Valley, but not in Columbia Plateau sites (Table 5.5). All others are shared between the Columbia and Thompson– Fraser Plateaus as characterized by their presence within Similkameen Valley sites. Named types listed are the closest analogous projectile point categories from the south Fraser and northern Columbia plateaus. Descriptions follow Lohse (1985, 1995):

Type 1: Windust C (Columbia Plateau); "Plano" (Fraser Plateau)

This point type is characterized by a squat, shouldered lanceolate outline with broad stems (Lohse 1995: 6). The Windust C type is also characterized by square to rectangular basal stems varying to contracting stems with convex bases. Flaking is variable, ranging from collateral to semi–collateral. Most points exhibit biconvex cross–sections and are made of cryptocrystalline silicates. Lateral edge–grinding is present, but does not on all examples. Age estimates range from 8,000 to 10,000 BP.

Type 2: Cascade A, B, C (Columbia Plateau); "Leaf–shaped Lanceolates" (Fraser Plateau)

Cascade points are described as three types; Cascade A, B, and C. Cascade A types exhibit broad to thick unnotched lanceolate bodies with rounded or pointed bases with no evident basal constriction. Serrated blade margins occur, but are generally rare. Cascade B types are slender, unnotched lanceolate bodies with slight concave bases and little to no basal constrictions. Cascade B points are rare, and often exhibit serrated blade margins.

Published illustrations resemble irregular Windust Phase points. Cascade C points are often referred to as "Classic" Cascade points. These specimens exhibit thin lanceolate bodies with no notching and contracting, rounded to pointed bases. These are often referred to as "leaf–shaped lanceolates" or "bipoints". Serrated margins occur frequently. Age estimates range from 4,000 to 8,000 BP for Cascade A types; 6,500 to 8,500 BP for Cascade B types and 4,000 to 8,000 BP for Cascade C types. Cascade C types are also found on the Fraser Plateau, but generally date 3,000 to 8,000 BP.

Type 3: Cold Springs Side–notched (Columbia Plateau); "Large Side–notched" (Fraser Plateau)

These points are generally large with side notches, convex blade margins and lateral contracting basal margins. Stem forms are straight to expanding with straight to convex bases. Age estimates range from 3,500 to 7,000 BP on the Columbia Plateau and 4,000 to 9,000 BP on the Fraser Plateau.

Type 4: Mahkin Shouldered (Columbia Plateau); "Shouldered Lanceolates" (Fraser Plateau)

These are variable in size, but most often occur as dart or lance points with shouldered and unnotched lanceolate bodies. They exhibit convex blade margins and stem forms are straight to contracting with rounded bases. Age estimates range 3,500 to 8,000 BP.

Type 5: Lehman Oblique notched (Fraser Plateau)

These points are characteristically thin with pentagonal bodies. They exhibit obliquely–oriented V–shaped corner to side notches. Base forms are generally expanding and exhibit edge grinding. Originally referred to as hafted scrapers (Sanger 1970a), Lawhead, Stryd and Curtin (1986) re–classified them based upon the then–limited distribution within the mid Fraser–Thompson River region. Age estimates are 4,000 to 6,000 BP, but terminal dates are uncertain at this time.

Type 6: Lochnore Side–notched (Fraser Plateau)

These exhibit leaf–shaped bodies with wide side notches, heavy basal grinding and pointed to convex bases. These distinctive points were originally defined within the mid Fraser–Thompson River region as were the Lehman Oblique Side–notched form (Lawhead et al. 1986; Stryd and Rousseau 1996). Age estimates range from 3,500 to 5,500 BP, but initial and terminal dates are uncertain.

Type 7: Shuswap Horizon Types 1, 2 and 8 (Fraser Plateau)

These points exhibit roughly lanceolate body morphologies with shallow corner removals or side–notches forming rounded shoulders, concave basal margins with slight to pronounced ears (Richards and Rousseau 1987: 25). Age estimates are 2,500 to 4,000 BP in general. Types 1 and 2 date 2,800 to 4,000 BP; Type 8 dates 2,500 to 4,000 BP.

Type 8: Shuswap Horizon Types 3 and 4 (Fraser Plateau)

Type 8 points exhibit triangular body morphologies with distinctive concave basal margins and shallow side to corner–removed notches and pronounced shoulders. Stems are generally expanding with concave bases. Type 4 is a smaller variant with concave to indented bases. Age estimates range from 2,500 to 4,000 BP.

Type 9: Shuswap Horizon Type 5 (Fraser Plateau)

These are large triangular to lanceolate body forms with wide side to corner–removed notches with pronounced shoulders. Basal margins are generally concave with straight to slightly expanding stems. Age estimates are 2,500 to 4,000 BP.

Type 10: Nespelem Bar (Columbia Plateau); "Shuswap Horizon Type 7" (Fraser Plateau)

Type 10 points are typically variable in size, but are generally considered dart points. They exhibit elongate, triangular body morphology with slight shoulders, but no notches. Bases are generally convex with contracting stems. Age estimates range from 3,000 to 5,000 BP, with estimates of 1,500 to 3,000 BP for Type 7.

Type 11: Rabbit Island "A" and "B" (Columbia Plateau);"Similkameen Stemmed" (Vivian 1992) (Similkameen Valley);"Shuswap Horizon Types 6 and 7" (Columbia Plateau)

These are points with narrow triangular bodies withsquare shoulders. Bases vary from straight to contracting stems with straight to rounded bases. Age estimates range from 2,000 to 4,000 BP for Columbia Plateau and Similkameen Valley specimens, and 1,500 to 3,000 BP for Shuswap Horizon Types 6 and 7 on the Fraser Plateau. Magne and Fedge (2002) equate these with Athapaskan Kavik or Klo–kut stemmed points in central British Columbia as well as to similar point types in southern Oregon.

Type 12: Columbia Corner–notched "A" (Columbia Plateau); "Corner–notched variants" (Fraser Plateau)

Type 12 points exhibit large bodies with triangular shapes and straight to convex blade margins. Corner notches are wide and deep, sometimes called a corner–removed trait. Stems are expanding and barbs project downwards. Bases are generally straight. Age estimates range from 2,000 to 4,000 BP on the Columbia Plateau and 1,200 to 2,400 BP for south Fraser Plateau variants.

Type 13: Quilomene Corner–notched (Columbia Plateau); "Corner–notched variants" (Fraser Plateau)

In general, these corner–notched points are larger than Type 11 with thicker bodies. They exhibit straight to convex lateral blade margins. Corner notches are wide and deep with slight downward projecting barbs. Stems are generally expanding with straight bases. Age estimates range from 2,000 to 3,000 BP on the Columbia Plateau and 1,200 to 2,400 BP for south Fraser Plateau variants.

Type 14: Quilomene Bar Basal–notched A and B (Columbia Plateau); "Basal–notched variants" (Fraser Plateau)

Quilomene Bar Basal–notched points are separated into two sub–types. Sub–type B is smaller, with shorter barbs than sub–type A. Both are characterized by triangular body shape with straight to convex blade margins. Barbs are distinctive and result from deep basal notching. Stems are square to contracting with generally straight bases. Similar styles occur in the mid Fraser–Thompson and Okanagan valleys. Age estimates range from 1,500 to 2,500 BP for the Columbia Plateau and(300 to 2,000 BP for south Fraser Plateau variants.

Type 15: Wallulla Rectangular Stemmed (Columbia Plateau); "Small stemmed variants" (Fraser Plateau)

These points are invariably small, triangular arrow–sized bodies with square shoulders formed by wide, low corner notches. Stems are long, narrow and straight sided with a convex to straight basal margin. Sometimes referred to as corner–removed attributes, they also form a range of variants in the Similkameen and south Okanagan Valleys and mid Fraser–Thompson regions. Age estimates range from 150 to 2,000 BP.

Type 16: Columbia Corner–notched "B" (Columbia Plateau); "Corner–notched variants" (Fraser Plateau)

These points resemble Columbia Corner–notched A specimens, but are smaller in all aspects and most likely represent bow and arrow technologies. Age estimates range from 150 to 2,000 BP.

Type 17a,b: Plateau Side–notched (Columbia Plateau); Plateau Small Side–notched (Columbia Plateau); Kamloops Horizon small side–notched and Kamloops Horizon small multi–notched (Fraser Plateau)

Small side–notched points, smaller than the Cold Springs type, were made on triangular preforms. These generally tend to be thin in cross–sectional area and have square to rectangular bases although there is a great deal of variation in base form. Larger forms (type 17a) with thicker cross–sections pre–date very small forms. The larger varieties are referred to as Plateau side– notched (cf. Lohse 1995). Plateau small side–notched point (type 17b) bases may be straight to concave. Some exhibit a slight spur on one or both base edge margins. A south Fraser Plateau variant, the Kamloops Horizon small multi–notched form, exhibits multiple notches along one blade margin. Small side–notched points in the Similkameen fall within the size ranges of the Kamloops variant, but lack blade margin multiple notches. As such, the Kamloops small side–notched type is not known to be present in the Similkameen Valley. Age estimates for Type 17a range from 1,500 to 2,000 BP (Plateau side–notched) and Type 17b dates from 150 to 1,500 BP (Plateau small side–notched).

Similkameen Projectile Points: Patterns

Typological identification coupled with radiometric assays indicates a continuum of projectile point styles ranging from the early through late Holocene. Patterns were identified as follows:

Early Holocene (10,000–6,000 BP). Early Holocene projectile points identified in the Similkameen valley are few. No fluted points have been found, but a heavily worn, basally edge–ground lanceolate point was recovered at tree line on Crater Mountain by Lower Similkameen elder Robert Dennis in the early 1970s. The specimen was photographed by the author in 1974, but has since been misplaced. It resembles non–stemmed Plano varieties from the Columbia Plateau and Plains culture areas (Figure 5.1), such as those reported for the Goshen (Goshen–Plainview) Complex of Wyoming and Montana (Frison and Bonnichsen 1996; Irwin 1968) dating earlier than 10,000 BP.

Figure 5.1: Early Lanceolate Point (Surface Find)

At least two specimens of the Western (Intermontane) Stemmed Point Tradition characterized by the Windust Phase of 8,000–11,000 BP (Ames et al. 1981; Rice 1965, 1972; Sappington 1994) have been identified. One is in a private collection and the other a surface find near a wetland in the Interior Douglas Fir (IDF) zone southwest of the Princeton Basin. Salo (1987) reported a Windust point from the Palmer Lake area of Washington State in a private collection.

A single, large, square–based, lanceolate stemmed point was located at DiRc–67 on the Wolfe Creek headwaters near Copper Mountain (Gould et al. 2001). It was manufactured of vitreous black chert and exhibits collateral flaking and slight basal edge grinding (see Appendix A). Edge grinding is characteristic of 30% to 85% of Windust points (Ames 2000a, c; Rice 1972). Both finds are located in a southeastern flowing late Pleistocene melt water channel that was in existence while the northern arm of the Similkameen was still choked with ice (Hills 1962) and may have been connected with the potential Cathedral Lakes refugium (Hebda 1999) across the highlands. A small variant point form similar to one identified by Rice (1972: 40, fig. 4e) has been observed in a private collection by the author, but permission to draw or photograph it has not been obtained. No image has been been published of the Windust point reported at site 45OK545 in Washington State (Salo 1987).

Windust point types have a known distribution through the Kootenay valley (Choquette 1996), Okanogan Highlands (Thoms 1987), and Methow Valley (Fulkerson 1988). No Windust or Lind–Coulee variants were identified in the Chief Joseph (Campbell 1985) or Wells (Chatters 1986; Grabert 1968) reservoirs. This is most likely due to a research emphasis on riverside, versus upland, areas. This suggests that early Holocene sites are rare, deeply buried, and/or restricted to mid–to upper elevation sub–alpine ecozones in the Okanagan–Similkameen. The connecting valley system between the Methow and Similkameen valleys via the Palmer Lake area may represent a plausible cultural connecting area for the early movement north of people with this technology.

Until more Windust Phase sites are located, excavated and dated, the earliest unequivocal evidence for human occupation in the Similkameen is in the Acnol'ux Phase, but dating 7,500–6,000 BP. Vivian (1992: 149–153) recorded 26 instances of Cascade points in private collections. To this number can be added three points associated with radiocarbon estimates of ca. 6,900 and 7,400 BP at Stirling Creek (DiRa–09) and one undated complete specimen from the Princeton Golf Club Springs site (DiRc–66), see Appendix A. Both were found in residential–logistical camps associated with big game (ungulate) hunting activities. These sites are located within catchment areas exhibiting floral and faunal resources that would have attracted seasonally mobile foragers.

Mid–Holocene (6,000–2,500 BP). Mid–Holocene sites are characterized by continued use of leaf–shaped Cascade point styles, Mahkin Shouldered (the evolved Cascade "C", Lohse [1995]) and Cold Springs side–notched types. The 31 Cascade points recorded for the Similkameen (Vivian 1992: 149–153; see Appendix A) are presumed to date between 4,500 to 7,500 BP or earlier. This estimate is based upon northern Columbia and southern Fraser Plateau data and radiometric estimates from DiRa–09 (Stirling Creek): of 6,920 ± 100 and 7,400 ± 90 BP (Table 5.2). Both Mahkin Shouldered and Cold Springs side–notched points are rare to absent in the Similkameen valley. A single Mahkin Shouldered preform was recorded as a surface find at the Princeton Golf Club site (DiRc–66) (Appendix A) and another from the surface of August Lake (DiRc–56) nearby. Although Cold Springs types are found in association with Cascade points in the Columbia Plateau, no Cold Springs side notched points have yet been found in a datable context in the Similkameen valley.

Vivian (1989a: 96, 1992: 84) identified a contracting–stemmed lanceolate Windust "C'" point from an undated context in the Wolfe Creek valley several kilometers downstream of the Copper Mountain find. Typologically, this specimen with its contracting base could be characterized as a Lind Coulee–style point, but appears closer to the Mahkin Shouldered type dating 3,500–8,000 BP. This particular specimen may be a transitional late Windust–early Cascade variant as it shares characteristics with a weakly shouldered early Cascade Phase variant from the Hatwai site on the Clearwater River in the southern Columbia Plateau (Ames 2000c; Sappington 1994), as well as Windust specimens from this region. Early weakly shouldered Cascade points are also known as Mahkin Shouldered types in the Chief Joseph Dam locale (Lohse 1985) and date ca. 3,500–8,000 BP in the Columbia Plateau and 5,200–6,600 BP in the Cascade Range (Lohse 1995, Mierendorf et al. 1998: 498). Vivian reported another Windust (re–classified as Mahkin Shouldered) point from August Lake (DiRc–56 site inventory form, 1989) south of Princeton.

Northern Fraser Plateau Lehman Oblique–notched projectile points are rare in the valley. Two recorded specimens were surface collected from DiRa–09 (Vivian 1992: 140– 153). This is the first recorded occurrence of this point style outside of the mid Thompson– Fraser River region where it has been dated 3,500–5,500 BP (Copp 1997a). The occurrence of a Lochnore side–notched projectile point from DiRa–09 is of some importance as this type has never been previously located in the Okanagan–Similkameen or Columbia Plateau. It was recovered from an uncertain stratigraphic context during monitoring of mechanized sediment removal operations. This point type is considered characteristic of Nesikep Tradition (4,500–7,000 BP) foraging culture (Pokotylo and Mitchell 1998; Stryd and Rousseau 1996) oriented towards ungulate hunting with some freshwater fishing and mollusk collecting. It should be noted that Wilson et al. (1992) view both point types as characteristic of a single Lehman–Lochnore complex *contra* Stryd and Rousseau (1996) and cannot be separated due to alleged component mixing.

Index fossils of the Lehman Phase (4,000–6,000 BP) include the oblique–notched projectile point type. Stryd and Rousseau (1996) hypothesize that Lehman Phase peoples lacked the capacity to capitalize on anadromous salmon, although some were taken. The Plateau Microblade tradition appears to be lacking in this phase, although evidence compiled by Wilson et al. (1992) at the Baker site (EdQx–3) contradicts this. Consensus indicates that the Lehman Phase represents development out of earlier Nesikep Tradition cultures.

The Lochnore Phase (3,500–5,500 BP) exhibits distinctive side–notched projectile points exhibiting heavy basal grinding, as well as concave–edge side scrapers and macroblades (Stryd and Rousseau 1996). Leaf–shaped projectile points (Cascade types), use of cyptocrystalline silicates over dacites, and a distinctive leaf–shaped knife exhibiting a prominent basal striking platform are considered typical traits. One of these leaf–shaped bifaces was recovered during sediment removal operations at DiRa–09. Small circular cultural depressions with mat–lodge configurations and interior storage pits have been found at the Baker site (EdQx–43) dating ca. 3,950–4,450 BP (Wilson et al. 1992). Unlike the opportunistic Lehman Phase inhabitants of the mid Fraser–Thompson, Lochnore Phase peoples have been characterized as a mapping–on forager strategy (cf. Binford 1980) focusing on a wider variety of fauna (Rousseau et al. 1991) since sites occur in river bottomlands as opposed to upland Lehman Phase sites. Intensive use of salmon is uncertain, but some evidence of storage has been recorded (Pokotylo and Mitchell 1998; Stryd and Rousseau 1996).

Of theoretical interest is the hypothesis advocated by Stryd and Rousseau (1996) that Lochnore Phase populations derived from earlier Old Cordilleran Tradition/Cascade Phase peoples of the Interior who, in turn, derive from Coastal Old Cordilleran (Pebble Tool)/Olcott Tradition populations migrating up major rivers to exploit salmon while adapting to xeric pine–sagebrush lowlands and more mesic Douglas Fir uplands. They believe that the more riverine–oriented Lochnore Phase peoples co–existed with upland– adapted Lehman Phase foragers, but eventually absorbed them through intermarriage and/or syncretic behaviour. If this was the case, then the presence of Lehman–Lochnore complex artifacts in the salmon–free Similkameen Valley requires explanation. Although undated and lacking context, these cultural materials could represent separate excursions into that territory, or it could represent an early mixed Lochnore–Lehman group (Wilson et al. 1992) traveling together from their northern cultural base prior to the hypothesized cultural assimilation. Southward expansion into the Similkameen Valley from the mid Fraser–Thompson may explain the change from leaf–shaped projectile point technology between 4,500–7,500 BP to a number of barbed and stemmed types by ca. 4,500 BP. However, the shift to more mesic, forested conditions may also provide a partial explanation for such shifts in material culture occurring at approximately similar times in both the Fraser and Columbia Plateaus (Lohse 1995) since Lochnore–Lehman complex artifacts do not occur in the Okanagan Valley to the east.

Sites dating 4,500–2,500 BP are rare in the Canadian Similkameen Valley, consisting of the Tcutcuwi'xa rock shelter (DhRa–02), Stirling Creek (DiRa–09) and Red Ants (DiRa–24) but are more frequent south of the border at Palmer Lake (Salo 1987). Projectile points dating to this time period include three series of stemmed and notched forms: Shuswap Horizon from the southern Fraser Plateau; Rabbit Island and Nespelem Bar stemmed, and Quilomene notched series from the northern Columbia Plateau. Those formed the majority of projectile points observed by

Vivian (1992) in private collections in the valley and were also found in the 1994 to 2003 sample of Similkameen sites.

Late Holocene (2,500–150 BP). Later Holocene Similkameen sites exhibit both sizes of Plateau side–notched projectile point types (Lohse 1995), with smaller variants predominating by the second half of this temporal distribution. Specimens have been recovered from excavations and observed in private collections. Wallula rectangular types are common in the northern Columbia Plateau, as are Plateau small side–notched forms (Lohse 1985). One specimen from DhQx–10 appears similar to Athapaskan Kavik point types (Dr. M. Magne, personal communication 2003), as do Rabbit Island points (Magne and Fedje 2003). Plateau small side–notched points are similar to those defined as Kamloops small side–notched varieties characteristic of the mid Fraser–Thompson and "Athapaskan" variants from the Chilcotin (Magne and Fedje 2003; Magne and Matson 1987). Examples have been found in excavated and surface collections (Appendix A) consisting of a radiometric assay of 710 ± 40 BP on ungulate bone fragments in association with a small side–notched point at DiRa–20 and an assay of 130 ± 40 BP at DhQx–10 confirm a late age for this style. A larger Plateau side–notched point was located in the pithouse–mat lodge feature at DiRa–20. It is associated with several corner– to basally–notched atlatl points from the same feature dated 1,980 ± 60 BP. It does not conform to the Cold Springs type, although it may provide evidence of an atlatl point type being adapted later to bow and arrow technology.

Similkameen Cultural Integrative Units

The unit of Similkameen cultural integration is the phase (cf. Willey and Phillips 1958). The Plateau Microblade tradition is a technological, not cultural, complex. It is recognized that the phases outlined below are a product of an etic perspective that is hierarchical in nature and, as such, each phase is an analytic unit thought to reflect temporal, spatial and socio–cultural changes over time. Preferably, a larger number of sites would have been excavated in order to provide more data, but funding/contract requirements necessitated spending more time developing a predictive site model for middle and upper elevation areas of the valley.

Phase Definitions. Again, five phases are proposed here, ranging from 10,000 to 150 BP (Table 5.6). These are arranged in three periods: Early (10,000–7,500 BP), Middle (7,500–2,500 BP) and Late (2,500–150 BP) to provide congruence with recent syntheses of Plateau prehistory (Ames 2000a, b, c; Ames et al. 1998; Chatters and Pokotylo 1998; Pokotylo and Mitchell 1998; Roll and Hackenberger 1998). Although the evidence for these phases is based upon site excavations generally limited to the northern portions of the valley as well as surveys south to the

International Border (Copp 2003b) and observation of private collections (Vivian 1992), they are assumed to represent the area currently identified as the traditional territories of the Upper and Lower Similkameen bands (see Chapter 3).

Table 5.6: Similkameen Phases

Phase	Min (yrs BP)	Max (yrs BP)	Comments
Sxwalhani.t	200	1,500	Small notched points, possible microblades and microcores (?); field and residential camps; logistical foraging–collecting
Snazai'st	1,500	2,500	Stemmed and notched points, microblades and microcores at least to 1,800 BP; field and residential camps; logistical foraging–collecting
Tcutcuwi'xa	2,500	4,500	Stemmed and notched points, microblades and microcores; field camps/rock shelter; logistical foraging–collecting. Mt. St. Helens Yn ash fall ca. 3,500 BP.
Acnol'ux	4,500	7,500	Cascade points, microblades and microcores; small field camps; logistical foraging–collecting. Early and late sub–phases in Columbia Plateau separated by Mazama ash fall ca. 6,800 BP.
Nxacin	7,500	10,000 (?)	Windust, Cascade and Mahkin Shouldered points; small field camps; logistical foraging–collecting

The few archaeological sites investigated in the Similkameen to date are characterized by a relative lack of formed tools, with diagnostic artifacts skewed towards projectile points and Plateau Microblade tradition technologies of wedge–shaped and quartz crystal microcores and microblades. The lack of formed tools, and high densities of lithic debitage emphasize the ephemeral, short–term nature of the majority of sites excavated. The only exception so far is the Snazai'st Village (DiRa–20) site that provides potential evidence of seasonal settlement in the form of a house structure, but even this site is characterized by a lack of formed tools other than projectile points.

Based upon the small sample of sites excavated (Appendix A), it would appear that the inhabitants of the Similkameen practiced versions of logistical foraging–collecting throughout the total known span of prehistory. The larger sites excavated (DiRa–09, DiRa–20, DhQx–10 and DhRa–02) did not exhibit evidence of food storage (i.e, cache pit features), nor were bone tools or fish remains present to suggest food collecting strategies. A large (ca. 24 m^2) area of the Snazai'st Village (DiRa–20) site may exhibit evidence of root processing in an earth oven, but excavations of less than eight percent of this feature proved inconclusive for functional identification.

Of particular concern for intra– and inter–regional comparisons within the Plateaus is the fact that many radiometric estimates derive from charcoal samples, but site reports are not always clear whether the charcoal was derived from a cultural feature (e.g., hearth, post–hole) or from sediments associated with cultural materials. For example, the earliest cultural deposits in the Five Mile Rapids site are reported to have been radiometrically dated to 9,785 ± 220 BP (Ames 2000a, b, c; Cressman et al. 1960). However, the sample was a composite of charcoal flecks derived from a two–meter thick anthropogenic stratum (Ames 2000d). Butler (no date, cited in Ames 2000d) re–assessed these sediments with nine additional radiometric samples and concluded that they date ca. 6,500–7,260 cal BC (ca. 7,600–8,100 BP).

Radiometric estimates cited in this thesis derive from ungulate bone rather than charcoal as no charcoal from any excavated site was directly associated with a cultural feature. Although there are problems with bone age estimates involving ungulates ingesting environmental carbon, the stratigraphic position of two estimates above St. Helens Yn tephra at DhRa–02 and one below the ash correspond well with the accepted age of the tephra fall (Appendix A). There is no doubt that the ungulate bones dated were cultural due to their associations with other cultural materials in anthropogenic sediments, and at least two exhibited stone tool cut marks. Again, the five phases, from earliest to most recent, are defined as follows:

Nxacin Phase (7,500–10,000(?) BP). Nxacin (pronounced "In–shah–sin") means "ancestors" in the Okanagan language. As such it is considered an appropriate term for the earliest evidence of occupation in the valley. To date, evidence is only known from surface collected Windust Phase projectile points or fragments found at various locations in the American and Canadian portions of the Similkameen valley. Referred to as the Windust Phase of the Columbia Plateau, it is subsumed under the terms Western Pluvial Lake Traditions and Western Stemmed Tradition by various authors (Ames 1988; Beck and Jones1997; Dixon 1999), as well as Intermontane Stemmed Point Tradition (Carlson 1996c, 1998). It may also be present near the Coast as indicated by a broken Scottsbluff point and base found at DhRn–11 and DhRn–25 within the Stave Lake reservoir drawdown east of Vancouver, British Columbia. (Dandurand et al. 1999: 133). It closely resembles the Windust point from DiRc–67 (Gould et al. 2001), discussed previously.

The most recent find is the Windust "C" projectile point surface collected near a marsh within a late Pleistocene melt water channel southeast of Copper Mountain in the Similkameen drainage (Gould et al. 2001). Manufactured of vitreous black chert, the DiRc–67 point exhibits generalized collateral flaking with light basal edge grinding (Figure 5.2). Edge grinding was observed on 33% of similar points in assemblages Rice (1972) used to define the Windust Phase of the lower Snake River region. Ames (2000a) provides a figure of 85% edge grinding. The point is estimated to have been at least 16 to 17 cm long prior to breakage. It is virtually identical to a specimen from the Marmes Rock Shelter (Rice 1972: 36, 38 fig. 3a). Neck–width is 2.3 cm at its widest across the top of the rectangular stem. Lower blade margins 0.7 to 1.0 cm above the shoulders exhibit two shallow notches most likely associated with sinew hafting on a split shaft or fore shaft. Lateral edge notching has been observed on other Windust projectile points (cf. Rice 1972).

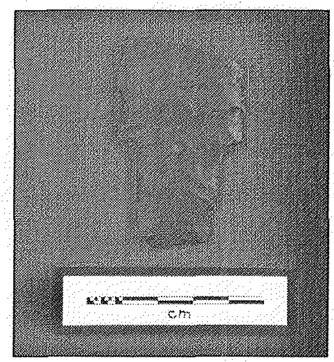

Figure 5.2: Windust Point

A single small contracting stemmed, lanceolate Windust style projectile point has been observed in a private collection near Keremeos (H. Allison Jr., personal communication 1999). Although provenience is lacking, the point resembles variants Rice (1972) referred to as a "shouldered lanceolate" (Figure 5.3). Until Windust style projectile points are located in situ with datable materials, their presence in the Similkameen valley remains demonstrated only by surface collections. The Copper Mountain Spring site (DiRc–67) and portions of the 2,000 hectare Princeton Stock Camp in the Wolfe Creek valley are scheduled for future testing by the Archaeology Department, Upper Similkameen First Nation. Hopefully, these excavations will confirm the presence of Nxacin (Windust) Phase peoples in the upper Similkameen as well as provide information about subsistence and settlement patterns.

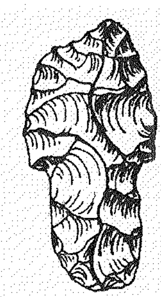

Figure 5.3: Windust Point Variant
(after Rice 1972: 63, fig. 14c)

It is hypothesized that Nxacin Phase sites in the Similkameen Valley will follow the pattern of Windust Phase sites in Washington State, mainly small mobile populations exploiting mid– to upper–elevations, generally away from river valley bottomlands. At times earlier than 10,000 BP north of the 49th Parallel, such a pattern is understandable since some valley bottoms were probably not ice–free at the time. Subsistence strategies presumably were based upon foraging, with some evidence of a foraging–collecting strategy evidenced by the Windust Phase small mat lodge structure and storage pits at the Newberry site in the Cascade Range of Oregon. Radiocarbon estimates on wooden posts provide a date of construction ca. 9,500 BP (Connolly 1999: 121). This site contains assemblages that include transitional late Windust–early Cascade Phase materials in pre–Mazama tephra contexts as well as post–Mazama artifacts. Typological similarities between the pre–and post–Mazama projectile Cascade points indicate cultural continuity between Windust and Cascade Phase occupations.

Acnol'ux Phase/Cascade Horizon (4,500–7,500 BP). Following established convention in the Plateau, the Acnol'ux (pronounced "Ashnola") Phase is a regional variant of Plateau–wide Cascade Phase designations (cf. Ames 2000a). As such, the Cascade Phase should more properly be referred to as the "Cascade Horizon" when discussed in the context of the Columbia Plateau. The Cascade Horizon is generally divided into two sub–phases based upon the pre– and post–date Mazama tephra falls dating ca. 6,800–7,000 BP and the post–Mazama introduction of Cold Springs projectile points (Ames 2000a; Ames et al. 1981, 1998; Bense 1972; Galm et al. 1981; Leonhardy and Rice 1970; Munsell 1968). Regional variants are also noted to in the mid–Columbia River early Vantage sub–phase (Galm et al. 1981); north–central Washington Karter Phase (Chatters 1984, 1986), West Cascades Olcott Phase (Wessen 1990); northwest Oregon Cascadia Phase (Beckham et al. 1981; Connolly 1986) and the southwestern Oregon Glade Tradition (Connolly 1986). All exhibit foliate or leaf–shaped projectile points (Cascade points), some with serrated blade margins (Lohse 1995, see Table 5.3 this report). It should be noted that Cascade point types (A, B and C) exhibit variable attribute traits in terms of thickness, quality of flaking and other criteria. Edge grinding is not always a defining criterion, but does occur (Figure 5.4). Mahkin Shouldered point types occur throughout in north–central Washington assemblages, and are suggested to derive from the earlier Windust C type (Lohse 1995). These resemble foliate Cascade forms, but exhibit weak shoulder configurations with contracting bases (Figure 5.4i).

A contracting stemmed, lanceolate Windust "A" (Lind Coulee), re–classified here as a Mahkin Shouldered (Figure 5.5), projectile point was recorded by Vivian (1989a, 1992) from DiRc–35. This red chert point measures 13.4 by 3.4 cm (maximum). Haft neck–width measures 2.0 cm below the shoulders. Flaking is collateral (Vivian 1989: 96, fig. 11b). This artifact was surface collected from previously excavated sediments on a colluvial fan. The site is situated at the west end of Wolfe Creek, several kilometers from the Copper Mountain Spring site (DiRc–67). A cut bank in the fan provided a stratigraphic profile indicating the presence of volcanic tephra at 100 to 110 cm below surface. This could be Mt. St. Helens Yn (ca. 3,400 BP) or Mazama (ca. 6,800 BP) tephra. The presence of an unidentified tephra layer and two paleosols indicates that the Wolfe Creek Valley has high potential for early to late–mid Holocene sites.

Vivian recorded a second potential Windust–like surface projectile point "similar to Windust points", also referred to as a Mahkin Shouldered type (Figure 5.6.). It was found on a trail at the north end of August Lake (Site Inventory Form: DiRc–56, 1989) south of Princeton. August Lake is located in the mid–elevation Ponderosa Pine Bunchgrass/Montane Spruce ecotone less than five kilometers from the Princeton Golf Club site (DiRc–66), as well as the Copper Mountain Spring site (DiRc–67). The projectile point is made of grey dacite with slight basal margin grinding and collateral flaking. It has since been repatriated to the Upper Similkameen First Nation (B. Gould, personal communication 2000).

Cascade Horizon settlement patterns consisted of small field camps with faunal assemblages indicating a foraging or foraging–collecting strategy near river bottoms, as well in upland areas associated with wetlands (Ames 1988; Chatters 1984, 1986). The Cascade Horizon indicates widespread continuity of material culture, subsistence and settlement patterns throughout the northern Columbia Plateau, as well as the southern Fraser Plateau and Cascade Range of southwestern British Columbia to Oregon. It is postulated to represent a widespread, possibly Sahaptian–speaking, culture (Hunn 2000). Cascade sites date ca. 4,500–7,500/8,000 BP in these regions.

The Cascade Phase concept is derived from Butler's (1961, 1962, 1965) Old Cordilleran Culture. Diagnostic elements included "willow" leaf–shaped projectile points that Butler designated "Cascade" points. Associated artifacts included ovate bifaces, blade and core technology, and edge–ground cobbles indicative of a generalized hunting–fishing–gathering (generalized foraging) subsistence base (Butler 1961, 1962: 56). This was originally framed as a number of working hypotheses explaining perceived widespread similarities in material culture, settlement and subsistence patterns. Butler proposed that an Old Cordilleran culture existed on both sides of the Cascade Range extending to the Great Basin–Klamath, southern Columbia Plateau and Puget Sound areas, and continued north along the cordillera to Alaska as well as south to the Andes. Daugherty (1962: 144) thought this very wide–ranging social

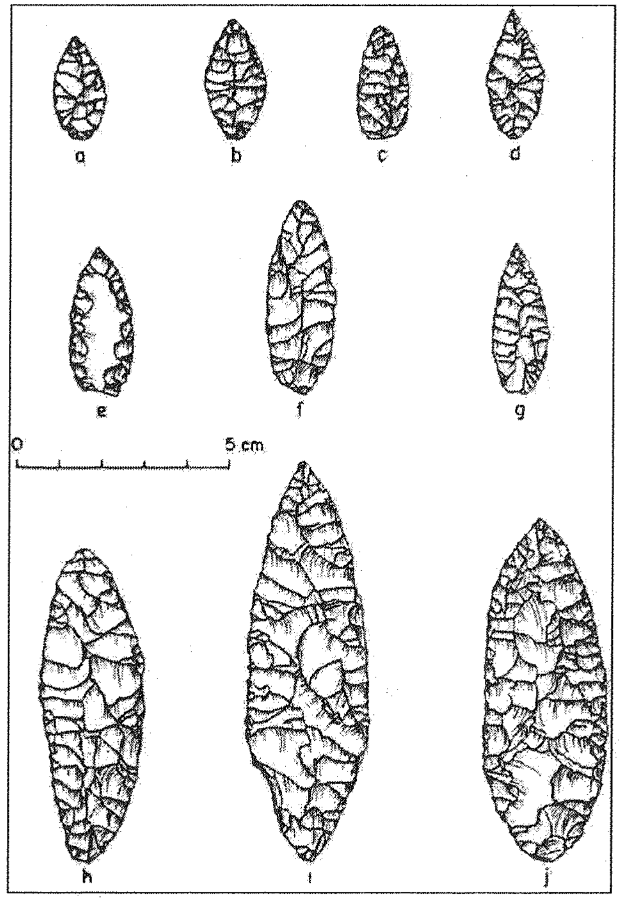

Figure 5.4: Typical Cascade Points
(after Sappington 1994)

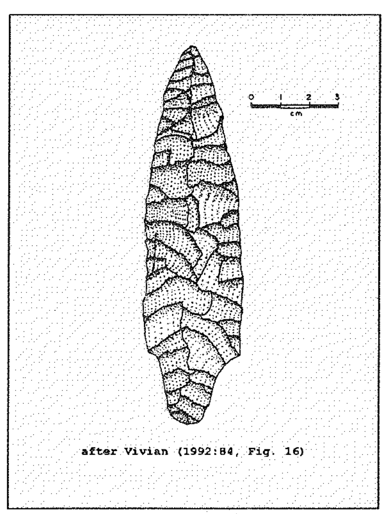

Figure 5.5: Cascade (Mahkin Shouldered) Point (DiRc–35)

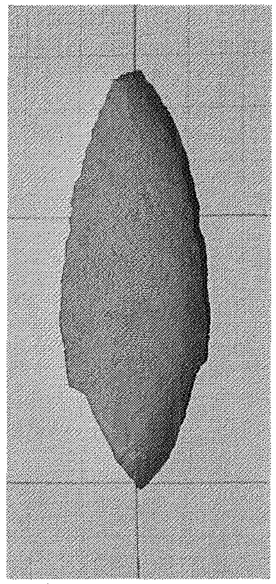

Figure 5.6: Cascade (Mahkin Shouldered) Point (DiRc–56)

inter–relationships had yet to be demonstrated, although the diagnostic material culture element was consistent with the definition of an archaeological Tradition (*sensu* Willey and Phillips 1958) in the Pacific Northwest. He referred to these Pacific Northwest assemblages as a Northwest Cordilleran Area Tradition.

Warren et al. (1968) analyzed assemblages from the lower Snake and mid– Columbia River regions that exhibited Lind Coulee and Windust stemmed projectile points, blades, edge–ground cobbles and ovate knives. These artifacts were observed to be consistently associated with one another in assemblages and were labeled the Border Columbia Complex. This complex was perceived to reflect a regional variant of the Old Cordilleran Culture/tradition. Daugherty (1962) defined a related Intermontane Western Tradition based upon Lind Coulee–style stemmed points and crescents. This tradition extended throughout the Intermontane west, but was principally proposed to explain relationships between the lower Snake River region and the Great Basin, little being known at the time of northwestern Columbia Plateau and Cascade regions. He recognized a relationship between the Old Cordilleran Culture/tradition and his Intermontane Western Tradition. This relationship has continued to be redefined within the stemmed and lanceolate projectile of the Windust Phase (8,000–11,000 BP) where Cascade–style points have been found embedded in Glacier Peak tephra, contemporaneous with early Windust Phase components at the Hatwaai site (Ames et al. 1981; Sappington 1994).

The Lind Coulee tradition was distinguished from Old Cordilleran by the occurrence of stemmed and shouldered points, concave–based points, crescents and milling stones (Warren

1968: 27–30). These characteristics were perceived to extend south from the southern Columbia Plateau to the deserts of California and Nevada. There, christened the San Dieguito Complex, it was thought to be a regional expression of early human occupants of xeric riverine and montane areas. It is now apparent that the Lind Coulee and San Dieguito Complex are older, and ancestral to the Cascade Horizon/Old Cordilleran Culture.

Nelson (1969) reviewed and revised Butler's Old Cordilleran concept by re– defining the Cascade point type. His criteria included collateral flaking reminiscent of Plano technology from east of the Rocky Mountains. Other criteria included the presence of basal striking platforms and proximal ends shaped in an ogival (i.e., pointed) arch. Butler (1969: 41) accepted this and indicated that the origins of the Old Cordilleran Culture should be found on the Plains. He considered re–classifying Old Cordilleran as a Plano tradition. However, collateral flaking is no longer considered restricted to Plano traditions, although it is apparent on most Windust Phase projectile points (see Rice 1972), but a larger sample of Cascade and Windust–style points (cf. Lohse 1995) indicates that flaking is variable in these early assemblages.

Coastal equivalents are also considered as part of the Old Cordilleran concept, exemplified by leaf–shaped (Cascade) points, edge–ground cobbles and other artifacts as defined by Butler (1961). Also defined as the Olcott Complex sites on the western Cascade foothills near Puget Sound, Kidd (1964) recognized similarities with Old Cordilleran sites, but rejected the idea that this was a cultural type. Mitchell (1971) incorporated these diagnostic materials into his Lithic Period for the Southern Coast, as did Carlson for his Early Period (1983a, b, 1988, 1990, 1995). Borden (1975) coined the term Proto–Western Tradition for similar materials found along the Pacific Northwest Coast. Matson (1976) included the Old Cordilleran for his sequence on the Lower Fraser River, as did Bergland (1983) on the Olympic Peninsula. Carlson (1998a) later exemplified Pacific Northwest Coast assemblages exhibiting leaf–shaped points, ovate knives and cobble tools as a coastal equivalent in his Cobble Tool Culture concept. The Olcott Complex continues to define Puget Sound sites of this type (Gallison 1994; Wessen 1990). That Coastal and western Old Cordilleran (Cascade) foothills assemblages resemble those of Interior sites is not in question. What the ontological and socio–economic relationships are among these concepts is uncertain. For example, the Acnol'ux Phase is entirely lacking in one of the essential diagnostic criteria, edge–ground cobbles, but exhibits a microblade technology also found in some Cascade Phase sites in the northern Columbia Plateau and Cascade Range (see discussion following). Edge–ground cobbles are also missing from Cascade components at the Layser Caves and the Judd Peaks sites. Although ground stone is rare at these later sites, represented by two ground stone fragments from

Judd Peak South and a single grinding stone at Layser Cave, Daugherty et al. (1987a, b) specifically refer to these sites as exhibiting Cascade Phase similarities.

Edge–ground cobbles are generally assumed to represent floral processing activities (Sims 1971) and would not be expected in some seasonal assemblages, i.e. occupations not associated with floral processing. The lack of this leg of the Old Cordilleran Tradition "triad" of diagnostic artifacts, but the addition of Plateau Microblade tradition technology in Similkameen sites, is considered a regional variation of a Plateau–wide Cascade Horizon.

The Acnol'ux Phase represents a Cascade Horizon variant in the Similkameen Valley. It is characterized by the earliest dated component at the Stirling Creek site (DiRa– 09) associated with radiometric estimates of ca. 6,900–7,400 BP (Appendix A). Undated components from the Princeton Golf Club site (DiRc–66) also may be included, given the presence of a Mahkin Shouldered point perform and leaf–shaped Cascade projectile points (Appendix A). Vivian's (1992: 149–152) analysis of Similkameen sites also indicated the presence of Cascade points in collections along Hayes Creek near Princeton, at Stirling Creek (DiRa–09) and at site DiRd–31, American sites included 45OK545, 546, 547 and 45OK558 in Washington State. Mahkin Shouldered points were found at DgRa–05, DiRd–13, and DiRd–24 in Canada as well as at 45OK557 in Washington State.

Unlike most Columbia Plateau manifestations of the Cascade Horizon, excavated Similkameen variants have an additional distinctive material culture marker in the manifestation of the Plateau Microblade tradition. In the northern Columbia Plateau and Cascade Range, early Cascade Phase sites consist of the following sites (Table 5.7):

Table 5.7: Acnol'ux Phase Sites with Plateau Microblade tradition Components

Site	**Location**	**Age Range (rcyrs BP)**	**Reference**
Stirling Creek	Upper Similkameen	1,800–7,400	Copp 1995, 1997a
Judd Peaks	Cascade Range	650–6,000	Daugherty et al. 1987a
Layser Cave	Cascade Range	4,000–6,700	Daugherty et al. 1987b
Princeton Golf Club	Upper Similkameen	Undated	Copp 2000d

The Judd Peaks North and South sites are Cascade Range rock shelters located in southwest Washington (Daugherty et al. 1987a,b). They are included in this discussion because Similkameen ethnographic territory extends across to the western flank of the Cascade Range. These two sites are interpreted as field camps for small groups of mobile hunters foraging in the Cascade Range uplands. The Stirling Creek and Princeton Golf Club sites are located near the banks of the Similkameen River. Stirling Creek is interpreted as a logistical field camp from which task groups sought game, berries, roots and non–subsistence items (e.g., hemp, lithics) in a mixed forager–collector strategy. The Princeton Golf Club site is situated beside a freshwater spring with access to riverine and upland resources as at Stirling Creek. It also is interpreted as a mixed foraging–collecting field camp from which task groups radiated.

All four sites are characterized by the same extremely limited range of formed tools, almost entirely restricted to projectile points and microblade cores, with microblades and debitage making up the bulk of the assemblages. Kelly's (1984) analysis of western Cascade/Puget Sound microblade and microcore assemblages showed a similar lack of formed tools. This led her to hypothesize that microblade technology was utilized by highly mobile foragers who had a vested interest in efficient expediency tools (microcores and microblades), especially in areas of limited lithic raw materials, or by a people who were not interested in expending resources procuring lithics.

Bense's (1972) analysis of excavated Cascade Phase sites in the southern Columbia Plateau concluded that settlement patterns resembled that of the highly mobile ethnohistoric Nez Perce, with small winter settlements (i.e., residential sites without house features) in river canyons, and population dispersement into upland areas in other seasons. Her analysis did not indicate changes associated with postulated climate changes in post–Mazama times (see discussion below). Ames (1988, 2000d) conversely, indicated that there were subtle differences in settlement patterns between Windust and early Cascade Phase sites in the southern Columbia Plateau. He postulated a tendency towards a collector–like strategy for the Windust Phase, with early Cascade Phase peoples utilizing a more typical forager pattern with high mobility levels over large territories. Support for Ames' model comes from studies of obsidian procurement and trade patterns in the Columbia Plateau. Hess (1997) sourced obsidian found in early Cascade Phase sites and concluded that groups focused on narrow areas (ca. 10 kilometers) over the short term, but also moved 150 to 400 kilometers over a period of two to three years. Hess (1997) also concluded that early Cascade groups moved between major river systems and uplands following major drainages, but utilized a different upland pattern. He hypothesized that groups moved across drainages, presumably following natural ridges and meadows. This pattern also has been hypothesized by researchers in the Similkameen (Copp 1995, 1997a; Hudson 1996) and is supported by historical and (presumed) pre–contact upland trails studied in the Whipsaw–Granite Creek watershed (Copp 2000c), as well as the Pasayten and Ashnola watersheds (Copp 1999e; Gould et al. 2000). A pattern of highly mobile foragers and/or forager–collectors operating within the river valleys of the Similkameen drainage as well as upland areas is envisioned for the early Cascade Horizon of the Similkameen Valley.

The terminous of the early Cascade Horizon has been set at the time of the Mazama tephra falls. Before systematic studies of the Mazama caldera (Matz 1991) were conducted, this closely spaced series of tephra falls was considered a single event. This event is associated with a radiocarbon estimate of ca. 6800 BP. After 6800 BP, a number of palaeoenvironmental studies (Alley 1976; Chatters 1984, 1986; Dalan 1985; Pellatt 1996) indicated climate change affecting regional biodiversity. This had severe impacts on central Columbia Plateau human and animal populations (Ames 2000c, d; Ames et al. 1998; Chatters 1984, 1986), when reduced river levels, elevated tree lines and expansion of xeric bioecological zones generally would have reduced local carrying capacities. However, in the higher elevations of the Similkameen Valley, these effects would have been less severe because of more mesic environments.

To date, anthropogenic sediments dating less than 6,800 BP occur at the Stirling Creek (DiRa–09) and Red Ants (DiRa–24) sites (Appendix A). Both contain Cascade points and microblade technology. Some cultural materials from the undated Princeton Golf Club site (DiRc–66) merit inclusion especially since Plateau Microblade tradition artifacts of dacite and cryptocrystalline silicates and quartz crystal are represented at both sites.

Culture history sequences for the northern Columbia Plateau (Ames 2000c; Ames et al. 1998; Chatters 1984, 1986, 1989; Galm et al. 1981) distinguish early from late Cascade Horizon sites by the occurrence of Mahkin Shouldered and Cold Springs side–notched projectile points, although these are only present in low frequencies in the Similkameen Valley. The presence of rare Lehman–Lochnore side and oblique–notched projectile points provides the first definite evidence of cultural influences from that area dating ca. 3,500–6,000 BP. The archaeological record is too sparse to be certain about the nature of north to south contacts at this time, but the presence of Cold Springs and Lehman–Lochnore complex artifacts is highly suggestive of joint use of the upper Similkameen Valley by populations originating in both Plateaus.

Cultural materials recovered at the Ryegrass Coulee site dated ca. 6,500 BP (Munsell 1968) can be included in the comparative population of southern Columbia Plateau sites. That site is an open field camp situated on the banks of the Columbia River near Vantage, Washington. It is interpreted as a field camp for forager–collectors based upon the evidence of salmon bones in anthropogenic sediments, also containing Cascade points, microcores and microblades. The Judd Peak and Layser Cave sites (Daugherty et al. 1987a, b) in the southeastern Washington State Cascade Range provide additional comparative material (see discussion above). These sites all have the common artifact denominators of Cascade–style projectile points made on a blade technology, but lack diagnostic edge–ground cobbles. They also all exhibit characteristic Plateau Microblade tradition technologies. A distinctive regional variation is that only the Stirling Creek and Princeton Golf Club sites exhibit quartz crystal microcores and microblades (Appendix A).

There are currently few known house features associated with northern Columbia and southern Fraser Plateau Cascade Horizon sites, although an early Cascade Phase upland site pithouse structure is reported at the Johnson Creek site (Pettigrew and Hodges 1985) in northern Oregon. A date of 5,960 ± 250 BP has been reported from that site, but three other assays dated closer to 5,000 BP, indicating a potential 5,000–6,000 BP span for the same feature. The next oldest structures were found at the Hatwaai site dated 4,000 to 5,800 BP (Ames et al. 1981; Sappington 1994) and at 45OK208 on the upper Columbia dated 4,590 ± 100 BP (Chatters 1984: 30). The oldest pithouse structure in the Thompson–Fraser Plateau dates 4,200–4,400 BP at the Baker site near Kamloops (Wilson et al. 1992).

To date, habitation features are rare in northern Columbia and southern Fraser Plateau early Cascade Phase sites (including the Cascade Range), although the much earlier 9,500 BP house feature at Newberry Crater (Connolly 1999) is indicative of at least one such site. Sites present are consistent with more mobile, seasonal field camps and rock shelters. No early house features have yet been identified in the Similkameen, although a recently discovered large side–entrance housepit depression associated with a surface Lehman Oblique–notched point (C. Allison, personal communication 2001) typologically dating ca. 4,000–6,000 BP in mid Fraser–Thompson locales, may prove to date from these times. A second large housepit depression with a side entrance was recorded on a terrace north of Hedley (Copp 2003a). This house type is known to be an early form in the adjacent Okanagan Valley (Grabert 1970) and also may represent early collecting strategy occupations in the Similkameen.

Tcutcuwi'xa Phase (2,500–4,500 BP). The Tcutcuwi'xa (pronounced "Chu–chu– way–ha") Phase is represented by a small sample of sites. Excavated components currently consist of the Tcutcuwi'xa Rock Shelter (DhRa–02) and possibly in strata of the Cool Creek (DhQx–10) and Stirling Creek (DiRa–09) sites. DhRa–02 contained cultural layers radiometrically dated between 3,200–3,800 BP (Appendix A), separated by a five cm thick lens of Mt. St. Helens Yn tephra. The tephra dates ca. 3,500 BP (Dr. N. Foit, personal communication 1999). DhQx–10, Component 1 is dated typologically by the occurrence of large leaf–shaped bifaces and a single stemmed Nespelem Bar point all underlying strata with small side–notched points.

A Lehman oblique–notched point also was recovered at site DiRd–13 on Asp Creek in the Tulameen Valley (Vivian 1992: 152) and a possible base fragment from DiRc–66 (Copp 2000d). A single Lochnore side–notched point base identified by A. Stryd (2000: pers. com.) was recovered from the Stirling Creek site during monitoring operations (Copp 1995, 1997a). These undated artifacts indicate the presence of mid Fraser–Thompson populations, or cultural interactions, with the Similkameen. As indicated in the previous section, the nature and context of these interactions, whether they represent population movements, trade or some other form of cultural interaction, are unknown at this time.

The only excavated sites in the Similkameen characteristic of this phase are the components at the Tcutcuwi'xa Rock Shelter (DhRa–02), dated between ca. 1,100 to 3,800 BP (Appendix A), at Stirling Creek (DiRa–09), and likely at Cool Creek (DhQx–10). Diagnostic artifacts were few, consisting of only six projectile points (leaf– shaped and stemmed varieties). Debitage consisted primarily of dacites representing later stages of reduction in low densities. No cores were found. The use of one pre–contact feature at DhRa–02, a large pit excavated sometime after the St. Helen's Yn tephra fall, was confirmed through bracketing by 3,200–3,800 BP radiocarbon assays (Appendix A). The few formed tools and low debitage densities contrast with rock shelters excavated elsewhere, especially Judd Peaks and Layser Cave (Daugherty et al. 1987a, b). This pattern, and the presence of a large number of pictographs painted on shelter walls, strongly suggests Similkameen elders' concerns about DhRa–02 as a sacred/ceremonial locus is correct.

The entire range of Tcutcuwi'xa Phase projectile points found through excavations, surveys and private collections (Vivian 1989a, 1992) include the following diagnostic types; Cascade, Lochnore side–notched, Lehman oblique–notched, Shuswap Horizon Types 1, 2, 3, 4, 5 and 8; Nespelem Bar; Rabbit Island A; and Columbia corner– notched A. Cascade, Lochnore side–notched, and Lehman oblique–notched projectile points are thought to disappear from the Fraser Plateau archaeological record by 3,000 to 4,000 BP. Notched and stemmed projectile point types other than Windust types generally occur by 4,000 BP, with the exception of the Nespelem Bar type that is introduced by 5,000 BP in the northern Columbia Plateau. The causes for replacement of earlier Cascade, Mahkin Stemmed, Lochnore, and Lehman point types by a variety of stemmed and notched forms is as yet poorly understood in both Plateaus, although this time period (< 4,500 BP) is associated with the establishment of more mesic, forested conditions

(Ames 1988; Chatters 1984, 1986, 1989; Galm et al. 1981: 94) especially an increase in fishing and root processing (Ames 1988, Chatters 1985; Peacock 1988).

That ethnic group replacement has not figured in traditional Columbia Plateau models of culture change is notable. Instead, a model of ethnic interaction advocated by Stryd and Rousseau (1996) describes perceived differences between Lehman (6,000– 5,500/4,000 BP) and Lochnore (5,500/4,750–3,900/3,500 BP) Phase assemblages of the Fraser Plateau. The Lehman Phase is considered an evolutionary outgrowth from the earlier (non–Salishan) Nesikep Tradition (7,000–4,400 BP), with subsistence strategies oriented towards riverine and upland areas focusing on ungulates, fish, and shellfish. The Lochnore Phase is considered a dry forest and riverine–adapted subsistence strategy followed by Salishan–speaking peoples moving up the Fraser River from the Coast (Stryd and Rousseau 1996) by 4,500 BP in order to exploit salmonid resources. The Lochnore Phase is perceived as initiating the Sqlelten Tradition (5,500–150 BP) that represents the local cultural development of Salishan–speakers. Stryd and Rousseau also see the Lochnore and Lehman Phase patterns as indicative of a 1,000–year overlap of two ethnic groups co–resident in the area. A partial list of diagnostic artifacts of the two phases is listed in Table 5.8:

Table 5.8: Diagnostic Lehman and Lochnore Phase Artifacts

Lehman Phase	Lochnore Phase
Lehman–oblique notched points	Lochnore side–notched points
Lanceolate knives	
Leaf–shaped knives	Oval bifaces, leaf–shaped points and knives
Circular scrapers	Round to oval scrapers
Horseshoe–shaped endscrapers	Concave–edged endscrapers
Vitreous dacites	Non–vitreous dacites
Absence of microblades	Microblade technology
	Macroblades
	Edge–battered pebbles
	Unifacial pebble choppers
	Notched pebbles

Of interest to this study is the apparent lack of microblade technology, pebble tools, macroblades, and edge–battered cobbles in Lehman Phase assemblages, although Rousseau (1990, cited in Wilson et al. 1992: 24) suggested the absence of microblades could be the result of sampling bias. Lithic raw materials favouring dacites over cryptocrystalline silicates may simply be a function of availability. With the exception of the diagnostic Lochnore side–notched projectile points, this simple trait list resembles many assemblages of the Columbia Plateau Cascade Pattern.

As discussed previously, the Wilson et al. (1992) excavations of the Baker site in the same region provided evidence of three dwellings (see discussion below) and associated artifact assemblages from nearby sites EdQx–41 and EdQx–42 was used to question the separation of Lochnore and Lehman Phase sites. He contends that sites of both phases exhibit mixed deposits *contra* Stryd and Rousseau (1996) and that there is no difference in bioecological, riverine and upland site distributions (Wilson et al. 1992: 187–190). Rather, they equate the EdQx–43 house assemblage with the more southern Indian Dan Phase of the Okanagan/Okanogan valleys. Wilson and his associates hypothesized strong connections from the Columbia Plateau at these times "there are strong influences from the Columbia Plateau into the south Thompson–Shuswap in the Middle Prehistoric period as well as influences from the Fraser–Thompson area as suggested by Lochnore– Lehman forms" (Wilson et al. 1992: 190). Typological distinctions are inferred to be indicative of different ethno–linguistic affiliations for these two phases. The use of material culture trait lists to determine ethnicity is controversial and remains to be tested for validity. Regardless of their exact cultural affiliation, Baker site storage pits with salmon bones indicate an early shift from foraging to collecting–type subsistence strategies.

Semi–subterranean pithouse structures make an appearance on the Columbia and southern Fraser Plateaus ca. 4,400–5,000 BP (Chatters 1984, 1986, 1989). Site 45OK208 on the upper Columbia was radiometrically dated to 4,590 ± 100 BP (Chatters 1984: 30) and is the earliest northern Columbia Plateau site with a definite house structure. Chatters analyzed the distribution of excavated housepit depressions and floors in the lower Snake and upper mid–Columbia areas and determined that semi–sedentary to sedentary season villages developed twice in these areas. The first period (Pithouse I) dates ca. 4,400 to 3,770 BP (Chatters 1984: 4), then abruptly ceased for close to 500 years. Pithouse structures reappear (Pithouse II) after 3,300 BP on the mid–Columbia River. The lower Snake River had the same initiation date for pithouses of 4,400 BP, but the hiatus fell between 4,060 and 3,440 BP (Chatters 1984: 4) for a period of approximately 600 years.

Chatters considered the hiatus as representing a cultural readjustment to a crisis in biodiversity along the two river ecosystems. Pithouse I people employed a mobile foraging subsistence strategy in proximity to a forest–steppe ecotone, but Pithouse II people used a collector–type strategy in proximity to river bottomlands (Chatters 1984: 16). A criticism of Chatters' synthesis is that he depends heavily upon sites generally located less than two kilometers from rivers' edge, although he includes at least one site located at a spring "a few hours walk" from the Columbia River (Chatters 1984: 9). Reid (1991) and Schalk et al. (1995) are also critical of

Chatters' perceived gap in the radiocarbon record, indicating that it may be due to settlement patterns shifts away from river canyons – possibly due to environmental stress. It would appear that systematic surveys of mid– to upper–elevations in the mid–Columbia River are needed to investigate this.

The earliest equivalent evidence for a seasonal occupation of a house feature in the southern Fraser Plateau are three mat lodge structures excavated at the Baker site (EdQx–43) in the south Thompson River valley (Wilson et al. 1992). Cultural depressions measured 3.3 x 3.1; 4.1 x 3.76; and 4.5 x 3.7 meters in diameter with depths of 35, 50 and 45 cm respectively. Interior hearth features were present, all offset from centers. All three houses exhibited interior storage pits with associated salmon bones. These structures were dated between 4,200–4,400 BP, comparable to Chatter's (1989) southern Columbia Plateau data in terms of time and the collector–type subsistence strategies indicated by salmon bones and interior pits within mat lodge houses. Closer culture similarities were seen with the Okanogan Indian Dan (Chatters 1984, 1986, 1989) and upper Columbia Kartar (Campbell 1985) Phases, rather than the local Lehman and Lochnore Phases.

Rousseau and Richards (1985) summarized southern Fraser Plateau pithouse dwellings as an integral component of their Plateau Pithouse Tradition (4,000/3,500–150 BP). The Baker site data adds another 200 to 400 years to this concept. Divided into three horizons, the Plateau Pithouse Tradition is characterized by the presence of seasonal pithouse villages with storage pits with intensive salmon exploitation documented or inferred. The Shuswap Horizon (4,400/3,500–2,400 BP) is thought to represent adaptive strategies in response to changing environments from warm and dry to cool and moist ca. 4,000 BP (Kuijt 1989). Dwellings take the form of medium to large pithouses with storage pits. The succeeding Plateau Horizon (2,400–1,200 BP) is characterized by smaller oval to circular pithouse structures that lack definable rims although central hearths are present. The Kamloops Horizon (1,200–150 BP) exhibits highly variable pithouse sizes and shapes.

The mid Fraser–Thompson Plateau Pithouse Horizons share some similarities to those of the Pithouse I and II periods developed by Chatters (1989) for the Columbia Plateau. These horizons indicate the development of forager–collector and collector–type subsistence strategies from ca. 4,500 BP to the ethnographic period. Although data are currently sparse, some pithouse or mat lodge depressions recorded in the Similkameen Valley date within this phase. Subsistence strategies are hypothesized to represent a shift from forager–collecting to a more seasonal and semi–sedentary collecting strategy particularly for those lower valley sites within a reasonable traveling distance to salmon fishing and curing stations. These are known to have existed downstream of Squantlen Falls and the Okanagan–Similkameen River confluence in Washington State and across the Okanagan Highlands divide to fishing stations at McIntyre Bluff and Okanagan Falls in Canadian territory (Chapters 2 and 3).

Snazai'st Phase (1,500–2,500 BP). The Snazai'st (pronounced "Snah–zai–ist") Phase is defined by components at four radiometrically dated and excavated Similkameen sites; Snazai'st Village (DiRa–20), Stirling Creek (DiRa–09), Tcutcuwi'xa Rock Shelter (DhRa–02), and the Cool Creek (DhQx–10) sites (Appendix A). Snazai'st means "striped rock" in the Okanagan language and refers to the distinctive layered patterns observable on the mountainsides at nearby Hedley.

The uppermost component at the Stirling Creek site contained notched projectile point forms (Quilomene Bar corner–notched, Columbia Valley corner–notched "A") and a biface cache which consisted of 28 triangular bifaces exhibiting convex to straight bases found in a cluster. These materials are associated with a radiometric assay of ca. 1,800 BP. The cache is of interest as caching behaviour has been equated with seasonal re– occupation strategies in residential camps in order to mobilize task groups (Binford 1979: 322). The presence of the biface cache suggests that the users planned to return to the site even though the bifaces were light enough to carry away (Figure 5.7). This behaviour indicates "gearing–up" strategies characteristic of logistical–residential camps by people utilizing a predominately foraging (i.e., hunting–gathering) subsistence strategy (cf. Kelly 1988: 720).

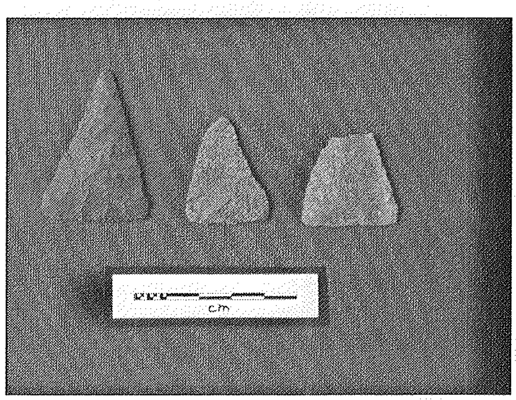

Figure 5.7: Biface cache (DiRa–09) examples

The Plateau Microblade tradition in this component of the site continued the use of dacites, cryptocrystalline silicates and quartz crystal materials for the manufacture of microcores and microblades.

Component 1 at Cool Creek (DhQx–10) exhibited two small leaf–shaped and one large Nespelem Bar point within a context of scattered hearths and ungulate bone dating to 2,290 ± 40 BP. The relative paucity of materials, compared to those of the overlying late pre–contact or protohistoric materials, suggests horizontal as well as vertical differention of components at this site. Cultural materials from the Tcutcuwi'xa Rock Shelter (DhRa–02) included only lithic debitage and a small leaf–shaped projectile point found between strata dating ca. 1,100 and 3,200 BP (Appendix A). Future excavations of the shelter are planned to determine if occupations vary horizontally, as well as vertically, in this site and enlarge the artifact sample.

Snazai'st Phase materials are best represented at the Snazai'st Village site (DiRa– 20). Initial test excavations (Copp et al. 1993, 1995c) indicated the presence of cultural materials typologically dating ca. 2,000–4,000 BP. Later test excavations in 1999 and 2000 confirmed these estimates with a radiometric assay on bone of 1,980 ± 60 BP (Appendix A). This assay derived from a sample of butchered ungulate bone from the floor of a 4.7 meter–wide circular mat lodge or small pithouse structure. Three one–meter–square excavation units were excavated. One unit covered the central portion of the house and revealed two hearths. One hearth was associated with hand–wrought iron nails and was situated about 90 cm south of the house center–point. An earlier hearth located at the center–point exhibited lithic debitage, butchered deer bones, and two projectile points.

Other artifacts included small asymmetric leaf–shaped, corner–notched and basal–notched points and a single medium side–notched projectile point. The majority of these were located in two contiguous one–meter–square units located in the southwest quadrant of the structure. Debitage consisted primarily of dacites and cryptocrystalline silicates. No formed lithic tools other than projectile points were located, nor was there evidence of microcores or microblades. The lack of the Plateau Microblade tradition artifacts in a presumed winter dwelling supports a long–held contention that microblades functioned as expediency tools during other seasons when populations were mobile. Faunal remains consisted almost entirely of deer bones exhibiting evidence of butchering and smashing for marrow extraction. No fish remains were located.

This is the only excavated house structure reported in the Similkameen Valley. With a diameter of 4.7 meters and a depth of 40 cm, it is characteristic of shallow, saucer– shaped house structures reported in the Okanagan Valley (Grabert 1970). It had a side–entrance oriented towards the river (west). Three large, flat cobbles were uncovered at the interface of floor and deeper non–cultural deposits. These may represent pole supports for a pole superstructure covered with reed mats. There was no discernible lip of roof sediments around the circumference, or below the surface sod layer. There was no evidence of a storage pits, although these may be buried beneath the toe–slope of Highway 97 that almost impacted the site.

The seasonal dwelling at DiRa–20 provided evidence that Snazai'st Phase Similkameen populations, or a segment thereof, practiced a semi–sedentary subsistence strategy. Lack of storage facilities within the tested dwelling as well as over the entire site, suggests a forager–collecting strategy where winter occupations served as residential base camps from which task–oriented groups radiated. Future excavation plans include collection of bulk sediment samples to determine if botanical residues indicate root consumption. The site is sufficiently distant from the nearest salmon fishing stations in the Okanagan and (American) Similkameen Valleys that its inhabitants most likely subsisted on stored roots and relied on winter hunting for survival.

An alternative hypothesis advocated by Robert K. Dennis of the Lower Similkameen First Nation suggested it to have been occupied by an individual, perhaps a shaman or other important person, or elders. He/she/they would have been supplied with foodstuffs since ethnographic records indicate that food served social and religious obligations as well as basic subsistence (R.K. Dennis, personal communication 2000). At least one of the remaining three cultural depressions needs to be tested to determine this. The Snazai'st Village site has provided the first direct evidence and dating for a seasonal, semi–sedentary settlement pattern in the Similkameen Valley. Interestingly, subsistence was dominated by deer hunting and was most likely accompanied by stored floral resources, especially roots as a dietary staple as opposed to salmon.

Sxwalhani.t Phase (200–1,500 BP). The Sxwalhani.t (pronounced "S–wall–hahn–it") Phase is represented at four radiometrically dated sites: Tcutcuwi'xa Rock Shelter (DhRa–02); Snazai'st Village (DiRa–20); Red Bridge (DhRa–13) camp; and the Cool Creek (DhQx–10) site. Components also are present at the Stirling Creek site (DiRa–09) where sediment mixing from pedestrian, equestrian ,and vehicular traffic has obscured relationships between the surface and underlying Snazai'st Phase component (Appendix A).

The Cool Creek (DhQx–10) site is located on the west bank of the Similkameen River where examples of Plateau small side–notched and Wallula Stemmed points were found in undisturbed deposits beneath a corral dated 130 ± 40 BP (Appendix A). Associated fauna included deer and/or sheep or goat, marmot, and beaver. Two burnt clay and ash basin–shaped hearths lacking fire–cracked rock were associated with these materials but were suspected to be intrusive since hearth features in the valley invariably include fire–cracked rock. The intrusive nature of these features was confirmed through a radiometric assay indicating the presence of modern carbon attributed to post–1950s thermonuclear testing at 112.1 BP ± 0.56 pMC (percent modern carbon), or less than 50 years BP (Dr. D. Hood, personal communication 2003).

Diagnostic artifacts from the Tcutcuwi'xa Rock Shelter associated with a radiometric estimate of 1,130 ± 100 BP included one corner–notched point and a small triangular perform (Appendix A), four sections of rolled birch bark, several nodules of red ochre, a small quartz crystal and a cryptocrystalline silicate microblade. Both the triangular perform and microblade were surface finds and cannot be assumed to derive from more recent occupations due to past vandalism and disturbance of some areas of the rock shelter. Debitage consisted of dacite and cryptocrystalline flakes representing secondary and tertiary lithic reduction stages. Faunal remains consist of fragments of ungulate (deer, wapiti, sheep/goat) with butchering marks and broken for marrow extraction.

Two areas in the northern portion of the Snazai'st Village (DiRa–20) site also provided evidence of this phase. One consisted of a 24–m^2 area of fire–altered rock measuring 5 to 10 cm deep. This was confirmed in two 1–m^2 square excavation units and probing of associated deposits. Although undated, small Plateau side–notched projectile points were found in association with the fire–altered rock feature. Projectile points of this type generally date ca. 150–1,800/1,500 BP in the Okanagan, Nicola, and mid Fraser–Thompson Valleys. Two 1–m^2 excavation units were placed in a flat area that had no surface indications of cultural activity. Several kilograms of badly fragmented and burnt or boiled ungulate bone were uncovered in association with small Plateau side–notched projectile points. A sample of unburnt bone was radiometrically assayed at 710 ± 40 BP (Appendix A).

Vivian (1992: 149–152) observed diagnostic small Plateau side–notched projectile points in collections from Hayes Creek site: DgRa–05, 12, 16; DiRc–53; DjRd–14; and DjRd– 17. The sole American site exhibiting this late period artifact was 45OK546. This confirms Grabert's (1970) and Copp's (1979) observations that small side–notched projectile points were differentially represented in the Okanagan Valley. They were most common north of the 49th Parallel. To the south, small arrow–size points are corner– and basal–notched types predominate, not rare side– notched forms. The dichotomy is assumed to indicate heavier southern Fraser Plateau influences in the Canadian portion of the northern Columbia Plateau in the last 1,500–1,600 years BP. It is assumed that sites characteristic of the Sxwalhani.t phase merge with the historic ethnographic patterns discussed in Chapter 3.

– CHAPTER 6 –

THE PLATEAU MICROBLADE TRADITION

The purpose of this chapter is to provide a synthesis and discussion of the nature of the Plateau Microblade tradition, or technological complex. The primary goal is to determine the validity of the tradition as originally defined (Sanger 1968a) through a review of spatial and temporal variables where microblades and/or microcores occur in datable contexts. Microblade technology in the Plateau is important since it has often been linked to the presence of Athapaskan–speaking populations (ARCAS Associates 1983; Carlson 1996c; Magne 2001, 2003; Magne and Fedje 2003; Magne and Matson 1984, 1987; Sanger 1967, 1968a, 1970a, b; Stryd and Rousseau 1996; Wyatt 1970). Since historical documents (see Chapter 3) indicate that Athapaskan–speaking peoples were late pre–contact and/or protohistoric inhabitants of the Similkameen Valley, it is important to evaluate a hypothesis that Athapaskan–speakers were carriers of the Plateau Microblade tradition. This evaluation is then linked to the discussion (see Chapters 7 and 8) of archaeological indications for ethnicity in terms of material cultural indices.

Although site excavations in the Similkameen Valley have not been numerous (see Chapter 4), the Sterling Creek Bridge site (DiRa–09) contained one of the largest assemblages of microblades and microcores from any site in southern British Columbia and north–central Washington State. Dating from 7,400–1,800 rcyrs BP, the lithic assemblage included a total of over 2,000 dacite, cryptocrystalline silicate, and quartz crystal microblades and microcores. Of the thousands of recorded archaeological sites in the Plateaus, there are only 105 sites recorded in British Columbia containing microblade technology. Of these, only 22 have been radiometrically dated. A similar situation is readily apparent for sites in Washington State. As such, sites exhibiting the Plateau Microblade traditions are generally rare occurences in Plateau contexts.

The Plateau Microblade tradition was defined over three decades ago, so a review of a database that has grown considerably since the late 1960s concerning origins and timing of this tradition is required, as is an evaluation of the hypothesized association of this technology with Athapaskan–speakers. It represents microcores and microblades made from wedge–shaped cores dating ca. 8,400–600 BP, possibly extending as recently as 300 BP. Terminal dates for the tradition are unclear, but it is found in many areas of the Fraser and northern Columbia Plateaus, including the Cascade Range. The majority of information concerning this tradition is drawn from site surveys, excavations and published regional and local syntheses. Major documentary sources are ARCAS Associates 1986; Baxter 1986; Beirne and Pokotylo 1979; Borden 1969, 1975; Browman and Munsell 1969; Campbell 1985; Chatters 1986; Connolly 1986, 1991; Copp 1995, 1997a; Daugherty et al. 1987a, b; Donahue 1975, 1978; Fladmark 1985; Greaves 1991, 1998; Kelly 1984; Ludowicz 1983; Mierendorf et al. 1998; Munsell 1968; Pettigrew 1980, 1981, 1990; Pettigrew and Lebow 1987; Sanger 1968a, b, 1970a; Sanger et al. 1970; Stryd and Rousseau 1996; Whitlam 1976; Wilmith 1978; and Wyatt 1970.

Diagnostic Plateau Microblade tradition Criteria

David Sanger (1968a, 1970a) originally defined the Plateau Microblade Tradition (technological tradition) based on work conducted in the Lochnore–Nesikep area. Diagnostic criteria included distinctive wedge–shaped microcores and microblades manufactured from siliceous basalts and cryptocrystalline silicates. Microblades have also been referred to as "small linear, blade–like flakes" or "linear microliths" by some American researchers, especially when microcores were lacking in assemblages (Campbell 1985: 301–303). Raw material use appears to have been depnendent upon local resource availability, with vitreous dacite dominating assemblages in the mid Fraser–Thompson River area, and cryptocrystalline silicates elsewhere.

Explanations for the presence of distinctive microblade technologies in the Plateaus range from expressions of ethno–linguistic identity (Magne and Fedje 2003; Magne and Matson 1984, 1987) to functionally specific technologies associated with certain tasks (Beirne and Pokotylo 1979; Fladmark 1986; Greaves 1991; Kelly 1984; Ludowicz 1983; Pokotylo 1978). These technologies have restricted spatial and temporal distributions in the Pacific Northwest. The focus of this chapter is to further explore these points.

Microblade Technology

Sanger's (1970a) definition of the Plateau Microblade Tradition was based upon a sample from the Lochnore–Nesikep locality in south–central British Columbia. Micorcore attributes were originally defined as:

- microblade removal from one core face;
- an apparent absence of ridge flakes (lames à crêtes) resulting from core flute face
- naturally weathered surfaces for the striking platform;
- single striking platforms indicate lack of core rotation; and
- the fluted surface contracts to a wedge–shaped keel (Sanger 1970a: 58).

Three criteria, notably the use of weathered striking platforms, removal of microblades from a single face and lack of flute surface ridge preparation flakes (lames à crêtes) appear to have been a factor of the small, localized samples available at the time and are no longer considered to be as diagnostic (Dr. M. Magne 2000: pers. com). More recent research has also shown that these traits are not necessarily valid diagnostic criteria of the entire tradition (Copp

1997a; Greaves 1991; Ludowicz 1983). This is a function of the expanded database given the much larger sample of microcores and microblades available in the 30–plus years since Sanger's studies.

Microcores exhibit the following traits (Figure 6.1):

- platform first (P_1) (Magne 1996; Morlan 1970) core reduction from tabular, cobble or pebble raw materials;
- selection for wedge–shaped tabular, cobble or pebble sections with flat platform surfaces, some of which exhibit weathering;
- bifacial edge preparation of some core faces, but not as true bifaces;
- evidence of keel battering on some cores;
- removal of microblades primarily from a single core face, but some cores show removal from one or two lateral faces; and
- rejuvenation of the core face through removal of the frontal face of the core. There is no evidence of the removal of core tablets to rejuvenate striking platforms as in the case with some Dyuktai (Flenniken 1987) or Campus–style/Denali wedge–shaped northern subarctic cores (Clark and Gottthardt 1999; Mobley 1991) and see Appendix A.

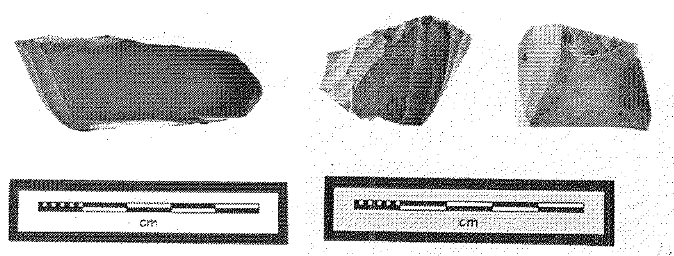

Figure 6.1: Plateau Wedge–Shaped Microcores, (DiRa–09)
(see Appendix A)

Microblades were rigourously defined. Sanger (1970a: 60) concluded that microblades were characterized by:

- detachment from a core from a single direction;
- straight to parallel blade edge margins;
- relatively thin cross–sections with relatively constant width/thickness indices;
- a striking platform/blade detachment angle of 90 degrees; and
- microcores in association.

Size is an important criterion, as a majority of Plateau microblades measure less than 30–mm long by 3 to 10–mm wide (Sanger et al. 1970; Wyatt 1970), see Figure 6.2.
Wyatt's (1970) analysis of the more than 700 microblades excavated during the 1962–64 field seasons in the Lochnore–Nesikep locality further refined microblade definition. In his discussion of microblade technologies, Wyatt (1970: 131) cited Taylor's (1962) width threshold criterion of 11 mm in order to distinguish microblades from larger bladelets and macroblades.

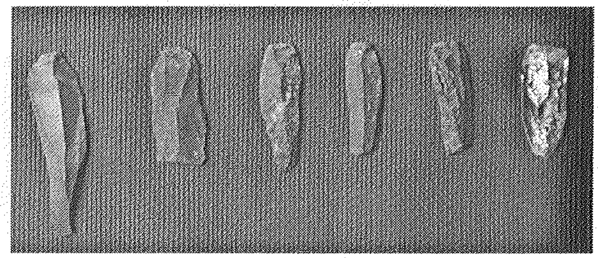

Figure 6.2: Plateau Microblades (DiRa–09)
(see Appendix A)

MacNeish (1964: 409) preferred a critical width threshold of 10 mm. Current researchers have adopted the 10 mm width threshold, although it is recognized that initial core preparation may result in flute surface microcore scars and attendant microblades exhibiting widths greater than 10 mm. It is suggested that a majority of microblades fall below 10 mm in maximum width. Other morphological and statistical criteria examined by Wyatt (1970: 131–145) include three quantitative measures: length, thickness and thickness/width index. Length was defined as "the maximum distance from proximal to distal end;" width as "the maximum distance between lateral edges;" thickness as "the maximum distance between dorsal and ventral faces ... measured at the same point, midway between proximal and distal ends;" and thickness/width index as "thickness in terms of percent of its width" (Wyatt 1970: 131–132).

Outline attributes were based upon examination of proximal and distal microblade portions. Complete microblades were defined by Wyatt (1970: 132) as

> the proximal end of a microblade whose outline has not been modified subsequent to its removal from a core, characteristically has a ventral bulb of percussion and dorsal scars of microcore preparations. At the distal end ... dorsal and ventral face (sic) converge to form a knife–like edge, or in a very few instances, a faceted distal edge.

In many instances the lateral edges and arrises meet at this end to form a pointed tip, and, in side view, convexity increases markedly toward the tip. The different morphologies of proximal and distal ends could have been considered two different attributes, but were considered definitive of the single–attribute, complete microblade.

The "square end" attribute was defined as a plane perpendicular to the ventral face. This plane is very often perpendicular to the long axis, and thus to the lateral edges and arrises (since they tend to parallel the long axis). Breaking (snapping) of a complete microblade almost certainly produced a square end. Location of the square end defines the attributes proximally square microblade, distally square microblade, and proximally–distally square microblade (Wyatt 1970: 132). The "square end" attribute is a microburin technique for snapping and removal of the proximal end (Crabtree 1982: 43), often in order to facilitate side–or end–hafting as composite tools (Figure 6.3).

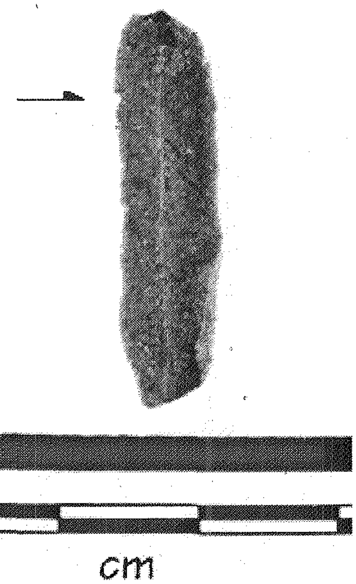

Figure 6.3: Microburin notch (upper left lateral edge)
(Site DiRa–09, see Appendix A)

Microblade cross–section attributes included "a microblade with triangular cross–section has one dorsal face, a microblade with non–triangular cross–section, more than one" (Wyatt 1970: 132). Retouched microblades tend to "show minute scars of intentional or use retouch, almost always along lateral edges" (Wyatt 1970: 132), although it is unclear whether this is evidence of hafting.

Wyatt (1970: 133) concluded his description of microblade attributes with the acknowledgement that raw material was a culturally dependent quality. Presumably, he was referring to individual preferences, idiosyncratic cultural variables (e.g., preference for colour) and relative availability of suitable raw materials. These are notably vitreous dacites in the Lochnore–Nesikep locality, but also include cryptocrystalline silicates (i.e. cherts and chalcedonies), obsidian and rare quartz crystal in other Plateau assemblages.

Review of the extant Plateau archaeological literature indicates that the above criteria, with minor modification, continue to be used to define microblade, or small, "linear blade–like flake" (Campbell 1985) and microcore assemblages. Moreover, researchers often refer to Sanger's (1970a), Sanger et al. (1970) and Wyatt's (1970) analyses as "index or type" fossils (fossiles directeurs) for this technological complex.

Plateau Microblade tradition Distributions

A document search of published and unpublished reports of sites exhibiting microblade technology (including sites with microblades only, but without microcores) for the Canadian Southern Fraser and U.S. northern Columbia Plateau regions is illustrated in Table 6.1. All radiometric estimates are in conventional radiocarbon years BP, with $t^{1/2}$ as 5,568 years.

Table 6.1: Plateau Microblade tradition Site Distribution

Area:	# sites	Age (min)	Age (max)	# dates	# cores	Core fragments	# microblades
Mid Fraser–Thompson	42	140	8,400	35	112	120	666
Okanagan–Similkameen	12	1800	7,400	4	46	32	2,182
Northern Columbia River	27	105	5,980	78	39	6	1,351
Mid–Columbia River	9	1500	6,470	3	23	0	400
Lower Columbia River	2	150	6,800	0	2	0	6
Totals:	91			120	222	158	4,599
Related Cascade Range Sites:							
Cascade Range – East	6	310	7,910	43	52	43	1,314
Cascade Range – West	8	580	7,800	10	19	4	48
Related sites – Oregon:							
Northern Oregon	1			0	1	0	0
Southwestern Oregon	6	310	8,560	23	142	0	484
Totals:	21			73	214	47	1,852

This table summarizes reported Plateau Microblade tradition sites in terms of the number of sites reported, radiocarbon estimates obtained as well as the number of items of microblade technology recovered. It includes information from Coastal Oregon as being ethnographic Athapaskan territories. Sites located in the Cascade Range and upper Skagit Valley (North Cascades Park) are included for comparison, as again, traditional Similkameen territory extended across the Cascade Range. The table indicates that the largest numbers of microblade sites are found within the mid Fraser–Thompson and northern Columbia River areas. Both have been major research foci since the late 1960s, associated with both academic and contract search. Radiometric estimates and site numbers indicate early appearances (> 5,000 BP) of the PMt in the mid Fraser–Thompson, Okanagan–Similkameen, mid to upper Columbia, Kootenay and eastern Cascades although only 22 or 105 sites have been radiometrically dated. Specific evidence of microblade technology in the Plateau and related areas thus ranges from the northern borders of the Thompson Plateau, the Kootenays, the Columbia River and portions of the Cascade Range to the Coquille and Rogue River Valleys in southwest Oregon (Figure 6.4, Table 6.2) from over 8,000 BP to probable Late Pre–contact times.

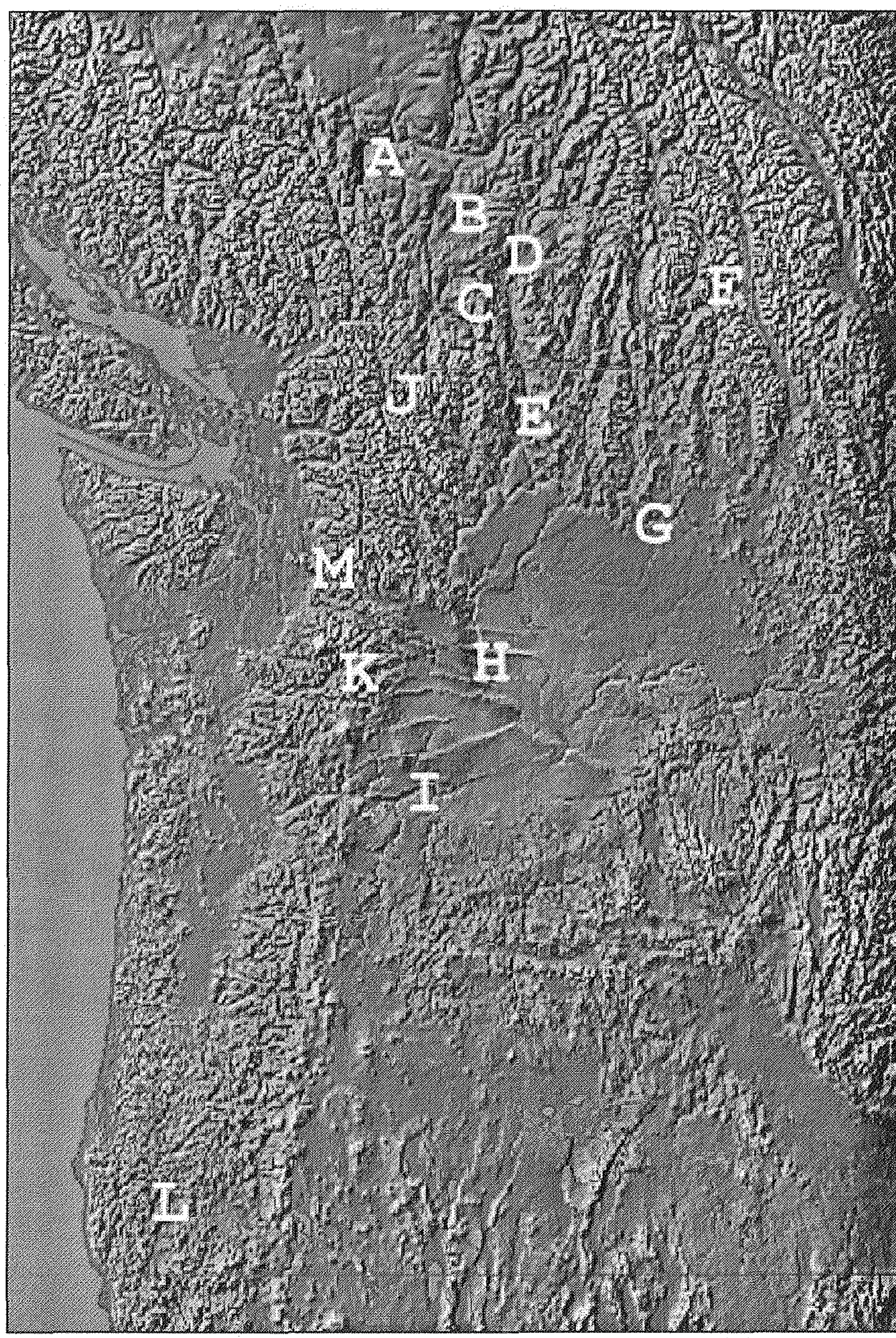

Figure 6.4: **Microblade Site Locales Discussed in Text** (after Sterner 1977, Johns Hopkins University Applied Physics Lab, used with permission)

Key:

A: Mid Fraser–Thompson
B: Nicola Valley
C: Similkameen Valley
D: Okanagan Valley
E: Okanagon Valley
F: Kootenay/Arrow Lakes
G: Upper Columbia
H: Mid–Columbia
I: Lower Columbia
J: Skagit Valley
K: Judd Peaks
L: Coquille/Rogue Valleys
M: Tolt River

The Plateau Microblade tradition discussion is limited to the physiographic, cultural and bioecological zones of the Thompson and Columbia Plateaus, but are found in some adjacent areas such as the central Rocky Mountains (Fedje 1996). A few assemblages are known on the eastern side of the Rocky Mountains in northeastern to north–central Alberta (Pyszczyk 1991; Sanger 1968b; Stevenson 1986; Wormington and Forbis 1965), and possibly as far south as Montana at the Lost Terrace site where an apparent microcore was recovered, albeit in an undated context (Greiser 1988: 126). These non–Plateau microblade industries are not discussed unless they provide reference information concerning areas adjacent to the Plateaus. Sub–boreal Fraser Plateau sites are summarized below as they occur within ethnohistoric Athapaskan territories.

The Northern Fraser Plateau (Chilcotin)

Microblade technology appears in sites of the Chilcotin region by at least 4,500 to 5,000 BP according to Donahue (1977), some in housepit feature contexts. The evidence for microblade technology in house deposits is controversial. Dating and stratigraphic associations are often not presented in sufficient detail to determine other than minimal or maximal dates. Mmicroblades associated with radiometeric estimates generally date within the last 2,500 years (Chatters and Pokotylo 1998: 89–92; Clark 2001: 109,117,126). A date of 465 ± 150 BC (ca. 2,500 BP) was reported from a multiple component pithouse structure with associated microblades at Natalkuz Lake (Borden 1952).

Later pithouse features with apparent microblades in three sites near Anahim Lake (Wilmeth 1978). He reported the presence of 105 microblades, but no microcores, in association with pithouse structures, with mixed components, dating ca. AD 1 to 400, AD 699 to 703 and AD 1740–1900. Potlatch site microblades were found within the Potlatch house (130 + 80 BP) associated with charred wood from house floor sediments, Tshandu (120 +130 BP) from a cache pit in the house floor, Spalyan Bato (1,695 ± 90 BP) from charcoal in house floor sediments), Bes Yaz (1,615 ± 80 BP) from charcoal in house floor sediments) and Tlokut (1,870 ± 75 BP) from charcoal in early component house sediments (Wilmeth 1978: 145–158). Goose Point site microblades were found in house floor sediments from Bes Tco (170 ± 55 BP), dated on a bone scatter; (245 ± 75 BP) from charcoal in the house floor, and (790 ± 205 BP) from charcoal in a post–hole. The Danitcko site house dated 1,247 ± 57 BP and 1,251 ± 57 BP, with estimates were derived from roof beams located above house floor sediments. The microblades were found in house fill, floor, bench and exterior (roof) deposits as recently as 160 BP and as early as ca. 1700 BP.

Wilmeth (1978: 111–116, 145–158) indicated that considerable mixing of components would explain microblades dating less than 1,600 BP, suggested that later microblades derive from underlying house and non–house deposits dating 1,600–2,000 BP. However, it is also possible that microblades were used as recently as the Protohistoric period at this site, given that 14 of 57 specimens (25%) in these structures were found within the latest house floor sediments. Support for late microblade manufacture may also be present in terms of; a fragment of a microblade core found at the protohistoric (ca. AD 1745) Chinlac site (Borden 1952), as well as microblades and a single microcore at the protohistoric Ulgatcho site (Donahue 1973).

This data from the Chilcotin parallels evidence for post–2,000 BP use of microblade technology in the southern Fraser (EdRg–1, EcRg–1, EcRg–2AA, EeRb–140, EeRj–55); Arrow Lakes (DiQj–5); Northern Columbia Plateau (45DO326, 45OK258, 45DO204, 45DO242, 45DO243, 45OK288); Cascade Range (Judd Peak North, Judd Peak South); Skagit Valley (45WH253); and Williamette Valley (35DO182, 35JA189 and 35JA190), see Table 6.2 and discussions following.

Here, the Plateau Microblade tradition is primarily limited to the physiographic, cultural and bioecological zones of the Thompson and Columbia Plateaus. Detailed discussion of sub–boreal Fraser Plateau sites is beyond the focus of this study as most data exists in government (gray literature) documents that, at this time, are difficult and expensive to access given that the provincial Archaeology Branch no longer has a loan function for its library.

Thompson Plateau Microblade tradition

The earliest known appearance of Thompson Plateau microblade technology dates 7,700–8,400 BP at the Landels site (EdRi–11) in the highlands south of the Fraser River (Rousseau et al. 1991). The Drynoch Slide site in the Fraser Canyon dated ca. 7,500 BP (Borden 1969; Sanger 1970a) and the early component at the Stirling Creek Bridge site in the Similkameen Valley at 6,900–7,400 BP (Copp 1995, 1997a) are the next oldest. These three site assemblages constitute the earliest evidence of the Plateau Microblade tradition in the Thompson Plateau. A convenient temporal marker is the main Mazama tephra fall, dated ca. 6,800 BP (Matz 1991), which all three sites pre–date.

Most information about the Plateau Microblade tradition derives from that mid Fraser–Thompson River region and nearby areas of south–central British Columbia. After Sangers (1968a; 1970a,b) pioneering efforts, work in the general vicinity continued with investigations of sites in the immediate mid Thompson–Fraser locale (Stryd 1973), upper Hat Creek Valley (Pokotylo 1978) and Highland Valley localities (ARCAS Associates 1983, 1986). Work by

Rousseau et al. (1991) in the Oregon Jack Creek locality, Busseys (1995) investigations at EeRf–1 near Savona, and Dr. G. Nicholas' (personal communication 1998) investigations of microblade components near Kamloops at EeRb–140 and EeRb–144 contributed to an expanded database.

Okanagan and Similkameen Plateau Microblade tradition Dates

In the Okanagan Valley, a microblade component at the Marron Lake site (DiQ2–2) dated ca. 2,500 BP (Grabert 1968, 1970). More recently, this author (Appendix A) recorded microblade–bearing assemblages at sites DiRa–09 (Stirling Creek Bridge), DhRb–04 (Golddust Gravel), DiRc–66 (Princeton Golf Club Springs), DhRa–02 (Tcutcuwixa rockshelter), DkRb–02 (Link Lake) and DiRb–01 (Wolfe Lake) in the Upper Similkameen Valley. However, the latter three sites each produced only a single microblade each.

Combining the mid Fraser–Thompson, Okanagan and Similkameen Valleys provides a database of 53 microblade sites with associated radiocarbon estimates of 140–8,400 BP (Table 6.2) and a total microblade industry sample of 156 microcores, 150 micocore fragments and 2,576 microblades or microblade fragments. These numbers constitute approximately 55% of known microcores, 76% of core fragments and 44% of microblades known from the Thompson and Columbia plateaus and eastern Cascades.

There is a bimodal distribution by time showing 21 sites (54%) dating less than 5,000 BP, ten (26%) are found within the 5,000–6,000 BP timeframe and eight (21%) at greater than 6,000 BP. Microblade technology has generally been assumed to disappear from the archaeological record by 2,400/2,000–1,800 B.P. in the Thompson Plateau (Copp 1997a; Richards and Rousseau 1987). Nine sites (23%) date less than 2,000 BP (Figure 6.5).

Various sites in the mid Fraser–Thompson and Highland Valleys, as well as the work of Mierendorf et al. (1998) in the Skagit drainage of the Cascade Range in northwest Washington, suggest termination dates of 600 BP or later. However, radiometric estimates found in association with microblade technologies dating less than 1,000 BP have been rejected by investigators under the assumption that recent dates may not be correct; reflecting sample contamination or component mixing (ARCAS Associates 1986; Beirne and Pokotylo 1979; Mierendorf et al. 1998). For example, Dr. G. Nicolas (personal communication 2006) questions, but does not entirely discount the possibility of proto–historic microblades occuring stratrigraphically above a radiometric estimate of 160 ± 50 BP at site EeRb–140 near Kamloops.

Table 6.2: Radiometrically–dated Plateau Microblade tradition Sites

Site	^{14}C	1σ	Cultural Association
EdRg–1	140	80	Kamloops phase/Protohistoric (?)
EeRb–140 (Kamloops)	160	50	Kamloops phase/Protohistoric (?)
EcRg–1	210	60	Quiltanton Complex (?)
Houth Creek (EeRj–55)	600	40	Kamloops phase
EcRg–2AA (mat lodge)	1,120	170	Quiltanton Complex mat lodge floor
Houth Creek (EeRj–55)	1,220	70	Kamloops phase
EcRg–2AA (mat lodge)	1,490	150	Quiltanton Complex mat lodge floor
Stirling Creek (DiRa–09)	1,800	90	Snazaist Phase
EcRg–2AA (mat lodge)	1,920	210	Quiltanton Complex mat lodge floor
Marron Lake (DiQw–02)	2,500	100	Chiliwist phase
Lochnore (EdRk–7) z. 1	2,605	140	Nesikep Tradition Housepit 2 sample
Lochnore (EdRk–7) z. 1	2,670	140	Nesikep Tradition Housepit 2 sample
Lochnore (EdRk–7) z. 1	2,680	100	Nesikep Tradition Housepit 2 sample
Lochnore (EdRk–7) z. 1	3,220	90	Nesikep Tradition Housepit 2 sample
Landels (EdRi–11)	3,250	70	Lochnore phase
Lochnore (EdRk–7) z. 1	3,280	125	Nesikep Tradition Housepit 2 sample
3 Sisters shelter (EdRi–2)	3,470	80	Lochnore phase
Cache Creek (EeRh–3)	3,920	65	Nesikep Tradition
Savona (EeRf–1)	4,220	70	Lochnore/early Nesikep phases
Savona (EeRf–1)	4,310	60	Lochnore/early Nesikep phases
Savona (EeRf–1)	4,310	60	Lochnore/early Nesikep phases
Monte Creek (EdQx–41)	5,100	110	Lochnore phase
EeRb–144 (Kamloops)	5,170	60	Middle Period
EeRb–144 (Kamloops)	5,250	50	Middle Period
Savona (EeRf–1)	5,390	60	Lochnore/early Nesikep phases
Monte Creek (EdQx–41)	5,480	100	Lochnore phase
Landels (EdRi–11)	5,480	70	Lochnore phase
Savona (EeRf–1)	5,480	70	Lochnore/early Nesikep phases
Savona (EeRf–1)	5,540	70	Lochnore/early Nesikep phases
Savona (EeRf–1)	5,670	60	Lochnore/early Nesikep phases
Monte Creek (EdQx–42)	5,920	130	Lochnore phase
Landels (EdRi–11)	6,000	80	mixed Lochnore/early Nesikep
Monte Creek (EdQx–42)	6,290	100	Lochnore phase
Lehman (EdRk–8) z. 2	6,650	110	early Nesikep Tradition
Stirling Creek (DiRa–09)	6,920	100	Acnolux Phase
Stirling Creek (DiRa–09)	7,400	90	Acnolux Phase
Drynoch Slide	7,530	230	Pre–Mazama
Landels (EdRi–11)	7,670	80	Pre–Mazama
Landels (EdRi–11)	8,400	80	Pre–Mazama

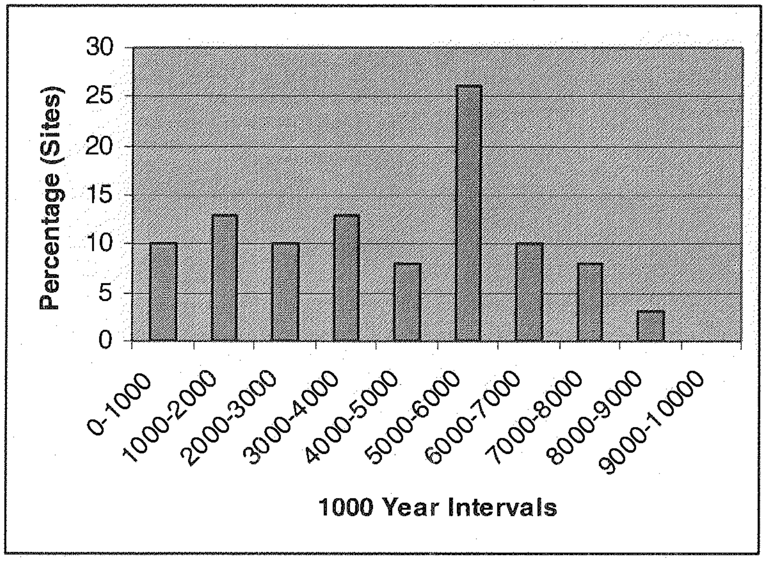

Figure 6.5: Thompson Plateau PMt Components

Radiocarbon estimates associated with Thompson Plateau microblade assemblages, with rare exceptions, were conducted on charcoal samples. Many such estimates, especially from earlier site reports, lack specific provenience. Instead, they are related only to a feature, such as a housepit floor deposit or a cultural stratum within a site. Without more detailed provenience information, it is difficult to ascertain the validity of their cultural association, especially when an author mentions that bone or charcoal were submitted as combined samples – presumably from the same feature or cultural stratum. Relatively few estimates derive from single bones. Single bone samples are considered to provide more reliable cultural associations than charcoal, given the possibility of non–cultural or mixed origins for burned wood in archaeological sites, unless the sample derives from a specific feature such as a hearth or post. The early dates from EdRi–11 (Landels) and DiRa–09 (Stirling Creek) derive from single deer bones. Otherwise, bone samples are often reported as combined numbers or weight, reducing reliability compared to a single bone specimen. A site–by–site critical evaluation of individual radiocarbon estimates was not conducted for research reported here due to the difficulty of deriving specific sample information from many site reports. These criticisms also hold for radiocarbon estimates discussed for northern Columbia Plateau and Cascade Range sites.

Thirty–nine radiocarbon estimates have been obtained on sites in the southern Fraser Plateau, including the Canadian Okanagan and Similkameen Valleys. Estimates derive from 24 sites, some with multiple components (see Table 6.3). When divided into 1,000–year time intervals, it is apparent that some intervals are represented by very few sites primarily those with multiple components. In fact, almost half of the estimates (18 of 39 sites) were obtained from cultural features or zones of only three sites (EcRg–2AA, EdRk–7 zone 1 and EeRf–1), indicating that a majority of sites have been dated by typological, geoarchaeological, or other methods. Again, only 22 sites have been radiometrically dated. Even though sites EcRg–2AA, EdRk7 zone 1 (both house floor components) and EdRf–1 comprise multiple age estimates, it is apparent that there is a better sample of Plateau microblade material in 24 separate sites dating from 600 to 8,400 BP in the southern Fraser Plateau than was available when Sanger (1970a) first defined the tradition.

Table 6.3: Multiple Radiocarbon Estimates on the Same Component

Age Range (rcyrs BP)	# Samples	# Sites	Comments
< 1,000	3	3	probable mixing of historic/protohistoric materials
1,000–2,000	5	3	three estimates derive from EcRg–2AA house floor
2,000–3,000	4	2	three estimates derive from EdRk–7 z.1
3,000–4,000	5	4	five estimates derive from same EdRk–7 z.1 house floor sample
4,000–5,000	3	1	three estimates derive from EeRf–1
5,000–6,000	10	6	four samples derive from EeRf–1
6,000–7,000	4	4	
7,000–8,000	3	3	
> 8000	1	1	
Totals:	39	24	

Northern Columbia Plateau and Cascade Range Plateau Microblade traditions

The Plateau Microblade tradition occurs along the Columbia River drainage, in north–central Washington at Kettle Falls where it seems likely to occur by at least by 8,800 BP, as well as in several components dating from ca. 6,800–1,400 BP (Chance and Chance 1982, 1985); 7,000–2,200 BP in the Wells Reservoir (Chatters 1986) and 7,000–3,000 BP in the Chief Joseph Reservoir (Campbell 1985). Due to the intensity of research in the Chief Joseph and Wells Reservoir areas of the upper Columbia River, sites with a microblade industry have larger numbers of radiometric assays in that area, indicating continuous use in some types of sites for at least 7,000 years or more. Sites exhibiting evidence of a microblade industry in this area date ca. 6,000–600 BP (see Table 6.4, Appendix C).

Figure 6.6 illustrates the temporal distribution of Northern Columbia Plateau sites where 99% (77 of 78 sites) date 5,000 BP or less. Twenty–eight percent (28%), or 22 of 78 sites, date less than 2,000 BP.

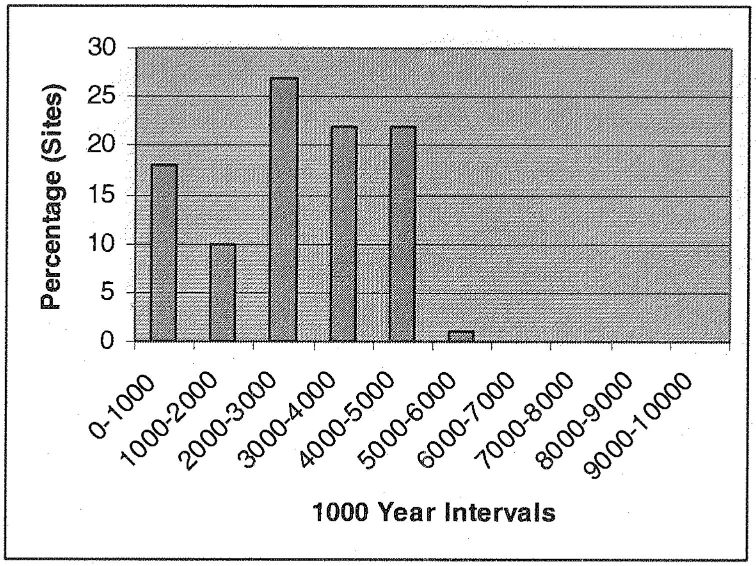

Figure 6.6: Northern Columbia Plateau PMt Components

Mid– to Lower Columbia River Sites. In areas east of the Cascade Range on the Columbia Plateau, Munsell (1968) recovered a microblade and core component at Ryegrass Coulee that post–dated the Mazama tephra fall (ca. 6,800 BP) and continued to ca. 3,500 BP. Farther south, on the eastern flank of the south–central Cascades, Rice (1968: 12) reported a single microblade and four small, blade–like flakes from the Umtanum Creek site dating ca. 3,500–2,800 BP. Osborne (1967) reported a limited occurrence of microblades in the Lower Grand Coulee area. Although radiometrically undated, Osborne (1967) hypothesized the following ages based upon typological similarities with other dated assemblages: Windy Spring (45GR88), Sun Lakes (45GR90), and Pictograph Springs (45GR91) at 2,500–1,500 BP and South Cave (45GR94) at 2,500–1,000 BP. In Hells Canyon, Caldwell and Mallory (1967: 137, plate 17m), provide a photograph of an "Ovoid Cutting Tool – Group 1" that resembles a Plateau microcore. Although no microblades or linear flakes were described, and none have since been reported, it is plausible that microblade technology was present in this area (Table 6.5).

With a sample of only four sites, the mid to lower Columbia PMt site temporal distribution is evenly split between sites dated less than 2,000 BP and those dated 6,000–7,000 BP.

Table 6.5: Mid to Lower Columbia Radiocarbon estimates

Site	Date	1σ	Comments
Windy Spring (45GR88)	1,080	200	1,500–4,500 BP (date rejected by researcher)
Ryegrass Coulee (45KT88)	6,470	80	above Mazama tephra in cultural sediments
Site	**Date**	**1σ**	**Comments**
Ryegrass Coulee (45KT88)	6,790	340	below Mazama tephra in uncertain cultural sediments
Lower Columbia:			
Meir Site			proto historic house (AD 1400–1813)

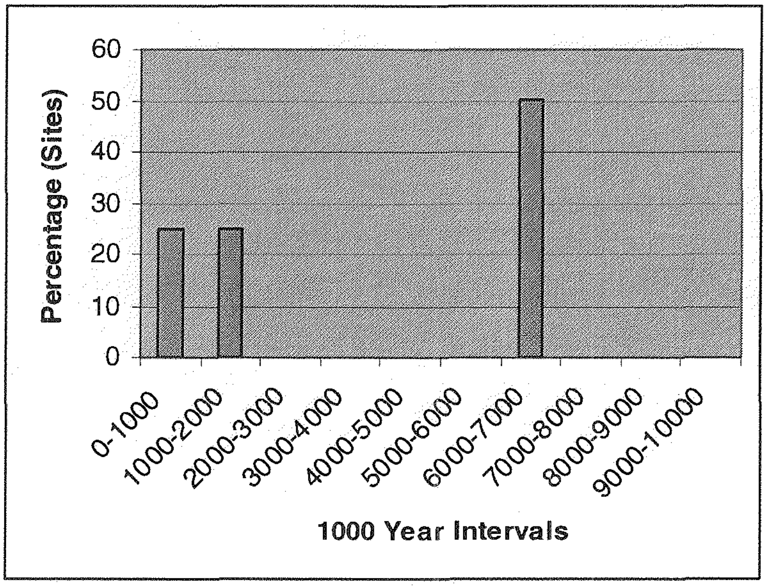

Figure 6.7: Mid to Lower Columbia Components

Cascade Microblade tradition Sites. Archaeological sites located within the eastern foothills of the Cascade Range as well as on the western flank in the Skagit River Valley provide evidence for microblade technology coeval to, and related to the Plateau Micorblade tradtion. The term Cascade Microblade tradition (CMt) is proposed for this data.

Cascade (East) Sites: Cascadia, Judd Peak and Layser Caves. Microblade assemblages are also known from two rock shelter sites near Mt. Rainer in Oregon; the Judd Peak and Layser Cave sites (Daugherty et al. 1987a, b). The Judd Peak assemblage dated 7,000–300 BP and Layser Cave at 7,500–3,400 BP. Cascadia Cave in northern Oregon also exhibits microblade assemblages dating 8,000–3,000 BP (Baxter 1986; Newman 1966) (Table 6.6).

Table 6.6: Cascade (East) Radiocarbon Estimates

Site	Date	1σ	Cultural Affiliation
Judd Peak South	310	90	Strata ½
Judd Peak South	350	50	Strata ½
Judd Peak North	650	50	Strata D–G: 650–1,070 BP
Judd Peak North	780	80	Strata D–G: 650–1,070 BP
Judd Peak North	800	70	Strata D–G: 650–1,070 BP
Judd Peak South	860	90	Stratum 2
Judd Peak North	1,010	50	Strata D–G: 650–1,070 BP
Judd Peak South	1,030	60	Stratum 2
Judd Peak North	1,070	120	Strata D–G: 650–1,070 BP
Judd Peak South	1,150	60	Stratum 2
Judd Peak South	1,249	120	Stratum 2
Layser Cave	3,980	70	Stratum 1
Layser Cave	5,200	70	Stratum 2
Judd Peak South	5,930	120	Stratum 5
Judd Peak South	5,970	100	Stratum 5
Layser Cave	6,445	120	Stratum 9
Layser Cave	6,650	120	Stratum 10
Cascadia Cave	7,910	280	3,000–8,000 BP: Cascade Phase

Figure 6.8 illustrates the temporal distribution of eastern Cascade PMt site where 30% (6 of 17 sites) dated 5,000 BP or earlier and 64% (11 of 17 sites) dated 2,000 BP or less. Only one site dated 3,000–4,000 BP.

Cascade (West) Sites: Skagit Valley, Cascade Divide and Tolt River. Mierendorf et al. (1998, 2006) report evidence of microblades in the Skagit Valley highlands near Ross Lake and Cascade Divide localities, with age estimates ranging from ca. 600 to 7,800 BP. They (Mierendorf et al. 1998) rejected a Late Period date of 380 ± 80 BP at site 45WH253 with an occurrence of only two microblades, as no microcores were present (Mierendorf et al. 1998: 370) and see Table 6.7. These are included here.

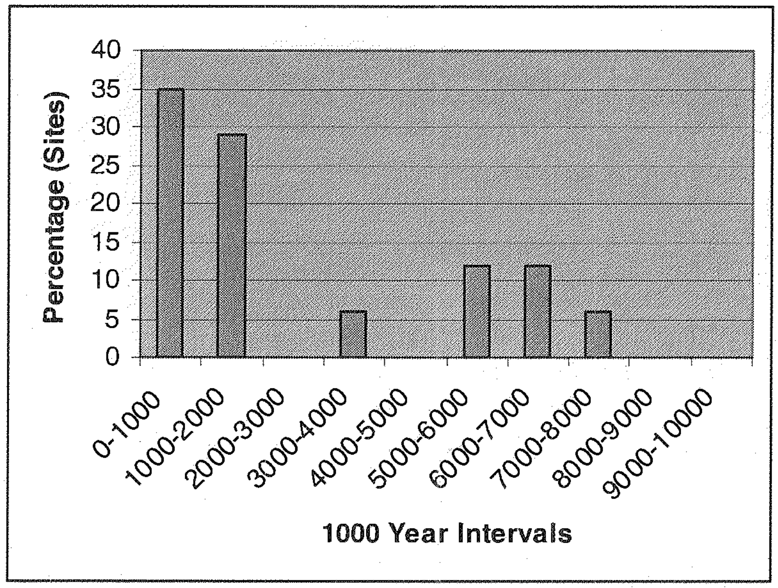

Figure 6.8: Cascade (East) Radiocarbon Estimates

Undated, disturbed components at the Hozameen Campground (45WH79) and the North Lightning Creek #10 (45WH286) sites included chert and quartz crystal microcores and microblades. Artifacts included diagnostic early stemmed lanceolate (Windust and Mahkin Shouldered), lanceolate (Cascade), Lochnore and Cold Springs side–notched, contracting stemmed (Nespelem Bar and Rabbit Island series) and various late Holocene corner–notched projectile points, indicating site occupations from early to late time periods (Mierendorf et al. 1998: 245–249, fig. 11.1a–11.1e). Mierendorf et al. (1998: 195) suggest microblade technology in these undated, mixed component sites most likely dates ca. 4,000–2,000 BP. A non–microblade component at the Cascade Pass site (45CH221) exhibited a Quilomene Bar point associated with a radiometric estimate on cultural hearth charcoal of 2,050 ± 80 BP (Mierendorf et al. 2006: 17) suggests microblades may have not been in use at some sites by this time.

Two microcores and 12, all manufactured of quartz crystal, were recovered from excavations at the Cascade Pass site (45CH221) on the crest of the northern Cascade Range in North Cascades National Park. These are associated with radiometric estimates on cultural hearth charcoal samples of 6,730 ± 70 and 7,730 ± 70 BP (Mierendorf et al. 2006: 17). These estimates fit well with stratigraphically associated dates for other volcanic tephra, e.g. Mt. St. Helens W at AD 1480–1482; Mt. St. Helens Y at ca. 3,500 cal BP; Glacier Peak–Dusty Creek at 5,800 cal BP and Mazama 0 at 7,650 cal BP (Mierendorf et al. 2006: 4).

Table 6.7: Cascade (West) Radiocarbon Estimates

Site	Date	1σ	Cultural Affiliation
Skagit (45WH253)	580	80	Cascade to Late period
Skagit (45WH283)	1,380	110	Late period
Skagit (45WH241)	1,430	90	Late period
Tolt River (45KI464)	1,710	110	Late period
Skagit (45WH300)	1,750	60	Late Middle to early Late period
Skagit (45WH300)	1,940	90	early Late period
Tolt River (45KI464)	4,120	130	Tolt River Phase (3,600–7,100 BP)
Tolt River (45KI464)	6,107	178	Tolt River Phase (3,600–7,100 BP)
Cascade Pass (45CH221)	6,730	70	Cascade
Cascade Pass (45Ch221)	7,730	70	Cascade

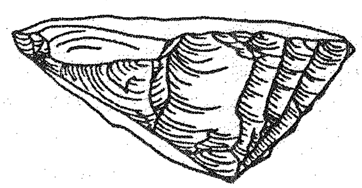

Figure 6.9: Skagit Valley Microcore (45WH283, surface)
(Mirendorf et al. 1998: 187, figure 10.26)

The occurrence of microcores (see Figure 6.8) and microblades in both dated and undated Upper Skagit Valley sites on the coast side of the Cascade Range indicate a Cascade Microblade tradition radiometrically dated as early as ca. 7,800 BP. Microblades commonly appear to continue in use until ca. 4,000 BP and then appear sporadically until ca. 600 BP or later as indicated by the apparent absence of microblade technology after ca. 4,000 BP at the Cascade Pass site (45CH221) but its continued presence in Skagit River Valley sites dated less than 2,000 BP (Table 6.7). Furthermore, the occurrence of quartz crystal raw materials is in common with the Similkameen Valley as well as the southern Northwest Coast (Croes 1995; Flenniken 1981; Kelly 1984; Mitchell 1968; Morgan 1999). Further south, the Tolt River (Stuweyuq$^{w)}$ site (45KI464) provided evidence of middle to late Holocene microblade technologies in quartz crystal, CCS and crystalline volcanic rock (CVR) (Onat et al. 2001 a, b). Five microblade cores were recovered; two chert, two quartz crystal and one CVR. Also recovered were four core rejuvenation flakes and 14 microblades (Onat et al. 2001b: 7–65 to 7–67, 7–155 to 7–157). The majority of this material derived from upper terrace mid–Holocene deposits dated 4,120 ± 120 to 6,107 ± 178 BP (Onat et al. 2001b: 6–10, table 6.4). A terminal date is suggested by a single quartz crystal core associated with a radiometric estimate of 1,710 ± 110 BP originating from later–Holocene deposits. The earliest occurrence is dated by two microblades deriving from early Holocene deposits suggested to date as early as 9,300 BP based on sedimentological analysis (Onat et al. 2001b: 8.197, 9.72).

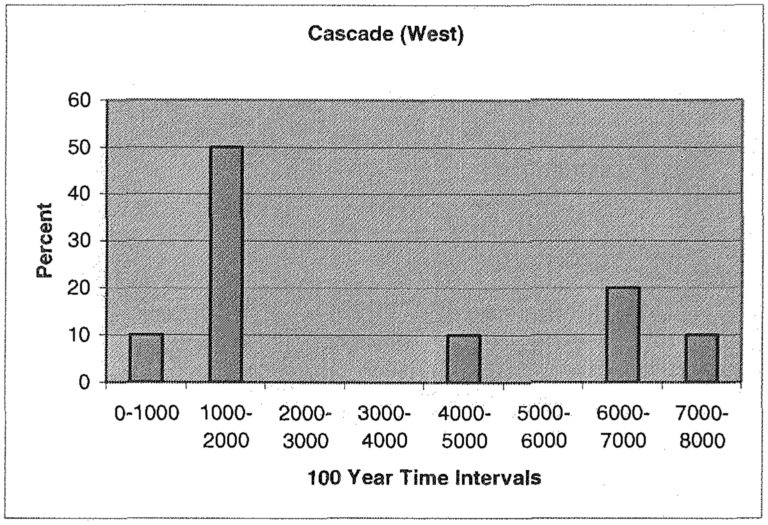

Figure 6.10: Cascade (West) Radiocarbon Estimates

Plateau and Cascade Microblade traditions: Summary

A microblade industry based upon wedge–shaped cores of basalt, cryptocrytalline silicates and rare quartz crystal has been a long–standing technology beginning ca. 8,000 BP throughout the Plateau regions of the Pacific Northwest, especially in the mid Fraser–Thompson, Okanagan–Similkameen and flanks of the Cascade Range. Sites appear by 5,000–6,000 BP in the northern Columbia River drainage and persist to 2,000 BP or later. The mid to lower Columbia sites date 6,000–7,000 BP and also persist to 2,000 BP, or later, although reported sites at any time are rare. This suggests the mid to lower Columbia River region maintained closer technological and cultural ties with the non–microblade cultures of the Great Basin to the south. A lack of reported microblade technology in the Snake River valley supports this conclusion.

The Cascade Microblade tradition i dates as early as Plateau Microblade tradition sites, or possibly earlier at the Tolt River site, and indicates similar Cascade and Plateau cultures were long–standing patterns of ca. 8,000 years or more. The Skagit River shows a similar temporal range with evidence dating ca. 6,000 to 8,000 BP and possibly within the last 500–600 years.

The preceeding discussion assumes that sites lacking microcores or microcore fragments, but exhibiting microblades or small linear blade–like flakes, represent a microblade/microcore technology. As small linear blade–like flakes identical to microblades can be produced during the manufacture of bifaces and bipolar core reduction (M. Rousseau, personal communication 2005), an examination of dated Plateau site components exhibiting microcores and/or micorocore fragments alone should provide reliable estimates of age and geographic distribution of the Plateau Microblade tradition. Table 6.8 (Appendix C) illustrates these data for the Plateau and related sites in the Cascade Range.

The distribution of radiocarbon assays strongly suggests that the Plateau Microblade tradition began by at least 7,500–8,000 BP and continued as late as 300–600 BP. Although most authors cite component mixing as explanations for radiometric assays of less than 2,000 BP, and this is a valid concern, these represent about 30% of known PMt radiometric assays of site components exhibiting microcores and/or microcore fragments.

In summary, the PMt and CMt evidence begins before 8,000 BP and continues as late as 300–600 BP, although most sites pre–date 3,500 to 2,500 BP. The terminal date of this technology has yet to be firmly established, but estimates of less than 600 BP have been recorded at Judd Peak South, Skagit (45WH253), Highland Valley (EcRg–1), Kamloops (EbRb–140), and Okanogan (45DO326, 45DO204, 45DO242) sites. The temporal pattern can be interpreted to support a Coastal to Interior movement of populations or technology upriver at least along the Fraser. The lack of earlier microblade–bearing sites along the mid to lower Columbia suggests that this drainage did not serve as a major conduit. Northern Columbia sites are not as early as those of the mid Fraser–Thompson or Okanagan–Similkameen, suggesting movement southwards from these centers. Alternatively, movement may also have been southwards from the Kootenay–Rocky Mountain areas following the upper Columbia drainage. Calibrated radiometric estimates for this discussion are presented in Appendix D.

The Coquille Microblade tradition of Oregon

A surface find of a microcore on Sauvie Island at the confluence of the Williamette and Columbia Rivers (Pettigrew 1978, 1981) was thought to be evidence of a microblade industry in Oregon, as were microcores and small, linear blades in assemblages at Coquille and Rogue River sites (Connolly 1991; Connolly et al. 1994). These areas are of interest because of their ethnohistoric Athapaskan–speaking populations and the hypothesis that microblades are associated with pre–contact migrations of these peoples into areas south of the subarctic and proximity to the Columbia Plateau.

Of 23 radiocarbon dates reported, 17 (74%) fall within the last 2,000 years (Table 6.9). This is well within the late pre–contact period associated with hypothesized Athapaskan migrations from the north. On the other hand, 26% of the mean assays date between 2,000–9,000 BP indicating the appearance of microblade technologies well before a defined late, post AD 1200 Athapaskan–speaking culture group had arisen in the North (cf. Morlan 1973; Shwinkin 1979). This suggests technology spread by diffusion, but does not rule out population movements. As such, the Standley and Rogue River sites fall within an "Athapaskan" time frame, but the Coquille River, Marial and one component of the Rogue River sites pre–date potential Athapaskan–speaking resident populations. Removing site components that lack microcores leaves three sites with radiometrically– dated components (Table 6.10).

Figure 6.11 and Table 6.11 indicate the presence of microblade technology as early as that of the Thompson Plateau, although site sample sizes are smaller. Of interest are the 74% (17 of 23 components) dating 2,000 BP or less. As this region is an ethnographic Athapaskan–speaking area, the presence of microblades and small stemmed (Kavik/Klo–kut variant) projectile points suggest that here, at least, an Athapaskan population can be confidently identified from the archaeological record (see Chapter 7).

Table 6.9: Coquille Microblade tradition Components

Site	Date	1σ	Age Range
Standley (35D0182)	310	50	260–360 BP
Rogue River (35JA190)	310	70	240–380 BP
Standley (35D0182)	410	60	350–470 BP
Standley (35D0182)	440	50	390–490 BP
Rogue River (34JA189)	680	90	590–770 BP
Rogue River (34JA189)	710	80	630–790 BP
Rogue River (34JA189)	810	130	680–940 BP
Standley (35D0182)	980	60	930–1,040 BP
Standley (35D0182)	990	70	920–1060 BP
Standley (35D0182)	1,060	50	990–1,110 BP
Rogue River (34JA189)	1,150	80	1,070–1,230 BP
Standley (35D0182)	1,180	70	1,110–1,250 BP
Rogue River (34JA189)	1,320	110	1,210–1,430 BP
Standley (35D0182)	1,480	70	1,410–1,550 BP
Rogue River (34JA189)	1,700	80	1,680–1,780 BP
Rogue River (34JA189)	1,700	120	1,580–1,820 BP
Standley (35D0182)	1,720	80	1,640–1,800 BP
Standley (35D0182)	2,300	50	2,250–2,350BP
Standley (35D0182)	2,350	80	2,270–2,430 BP
Rogue River (34JA189)	4,456	80	4,376–4,536 BP
Coquille River (35DO47)	5,859	120	5,739–5,979 BP
Coquille River (35DO47)	6,485	80	6,480–6,565 BP
Marial (35CU84)	8,560	90	8,470–8,650 BP

Originally defined by Pettigrew (1978) as the Coquille Microblade Industry, microcores and microblades from two sites, 35DO13 and 35DO47, were compared with the Lochnore–Nesikep sample and the sample from Ryegrass Coulee. Although southern Oregon microcores were smaller than the Lochnore–Nesikep and Ryegrass Coulee site samples in terms of core height and maximum flute length, Pettigrew (1978) concluded that Sangers Plateau Microblade Tradition could be extended to include the Coquille assemblages.

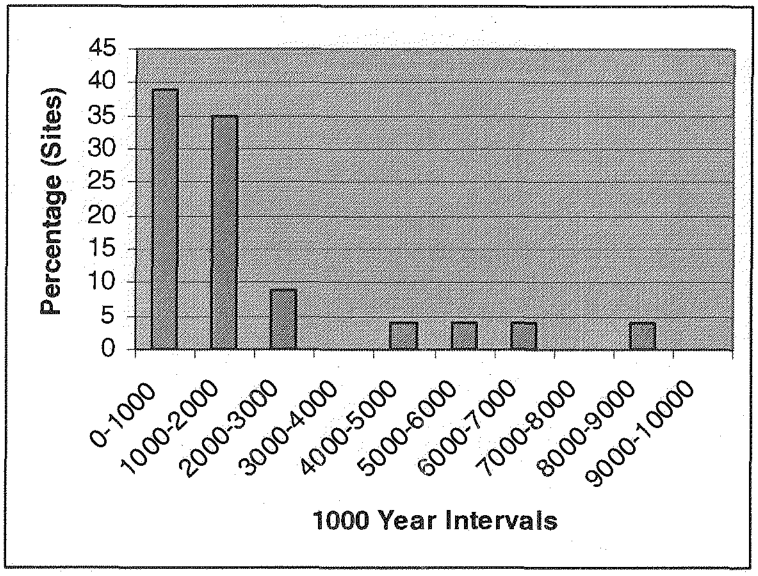

Figure 6.11: Coquille Microblade tradition Temporal Distribtion

Table 6.10: Southern Oregon Dated Sites with Microcores

Sites	^{14}C	1σ	Cores	References
Coquille River (35DO47)	5,859	120	19	Pettigrew and LeBow 1987
Rogue River (34JA189)	1,700	80	28	Connolly et al. 1994
Rogue River (34JA189)	1,150	80	8	Connolly et al. 1994
Rogue River (34JA189)	680	90	11	Connolly et al. 1994
Standley (35D0182)	310	50	10	Connolly 1991
Rogue River (35JA190)	310	70	12	Connolly et al. 1994

Connolly's (1991) and Connolly et al. (1994) research at 35DO182 (the Standley site) in the Camas Valley and sites 35JA189 and 35JA190 on the Upper Rogue River included a sample of 42 potential microcores similar to the Coquille River specimens, as well as a review of a reported microblade assemblage from 35CU84 (the Marial site). This re–analysis led him to conclude that these were all non–microblade technologies, primarily because microcore specimens examined were small. Although Connolly's (1991: 91, fig. 25) assemblage analyses included 99 "linear microliths" which fit Wyatt's (1970) criteria for microblade width and width/thickness index measurements, he rejected them as microblades. Similarly, he defined the microcores as "fluted scrapers," or later as "thick butt endscrapers" (Connolly 1991; Connolly et al. 1994) rejecting them as evidence for true microblade technology. Examination of line drawings of his "fluted scrapers" indicates that these artifacts are indeed wedge–shaped microcores (Connolly 1991: 76, fig. 39 a–f), albeit small examples (see Figure 6.12 below).

Citing Cook's (1968) analysis of a small sample of Denali–type cores from Alaska and the Yukon as scrapers with distinctive edge use–wear characteristics, Connolly deduced that the "diminutive" cores from 35DO182, 35JA189 and 35JA190 reflect function, rather than form – with distinctive edge–wear evidence of use as scraping implements. However, microblade cores may also serve as scrapers as suggested by two microcores exhibiting scraper–like edgewear from Namu (Hutchings 1996: 169, figure 2) as well as numerous examples from late Pleistocene Siberian contexts (Goebel 2002: 124).

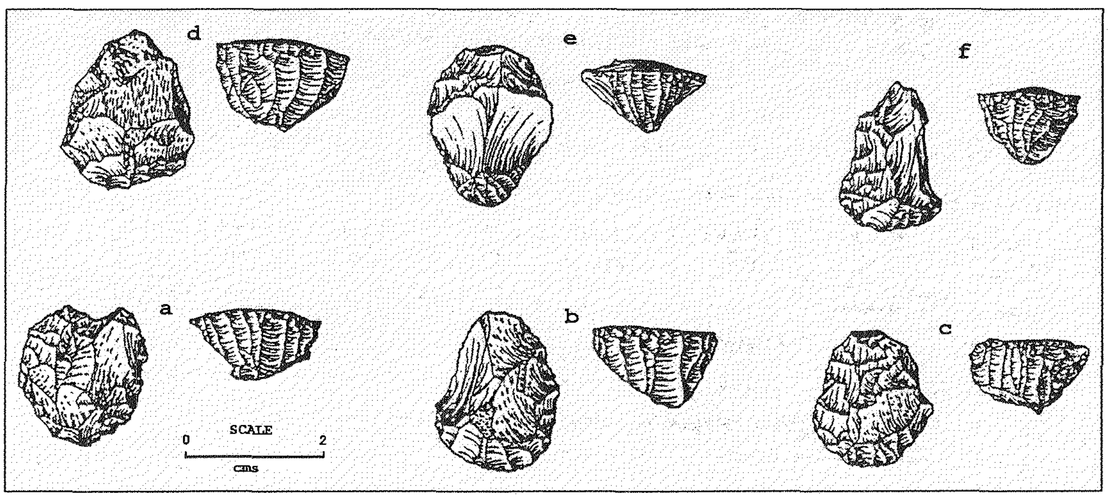

Figure 6.12: Coquille Microcores
(after Connolly 1991: 76, figure 39 a–f, rotated 180 degrees from original)

Small, linear microliths also have been deduced to be a random by–product (i.e. unused debitage) of the endscraper manufacturing sequence (Connolly 1991: 86). Corroborative evidence was cited from Kelly's (1984) analysis of Chehalis Valley microblade assemblages in which replication experiments indicated that microblades could be fortuitously produced during bifacial reduction sequences. Thus, rather than a distinctive microblade industry, Connolly (1991: 87) concluded that "while blades may be intentionally produced ... the mechanics of the technology are such that if structural ridges are systematically utilized in any lithic reduction process, blades will be inevitably, or fortuitously, produced".

Connolly did not examine assemblages for the presence of utilized and/or retouched microblades. Such materials are without associated microres in many assemblages of the Plateau Microblade tradition east of the Cascade Range as reported by ARCAS Associates 1983: 43–44, 148–151; 1986: 189–195, 237; Beirne and Pokotylo 1979: 3–13; Campbell 1985: 304–311; Chatters 1984: A119–A122; Greaves 1991: 141–147, 151–154, 233–235, 306–328; Ludowicz 1983: 90,107, table 1; Mohs 1981: 51–59; Rousseau et al. 1991: 36; Sanger 1970a: 50–69; Whitlam 1976: 25–40, 1980: 54–56; and Wyatt 1972: 4, 162 (see Table 6.2). Dr. R. Carlson (personal communication 1998) indicated that early research in south–central Coastal British Columbian microblade site assemblages lacked evidence for microcores until much larger excavation samples were obtained. This could be an explanation for the apparent lack of these tools.

Between 1991 and 1998 Connolly, and others working on the west side of the Cascade Range in southern Oregon, appear to have rejected the evidence for a microblade industry in the area. Dr. L. Gilsen (personal communication 1998), commenting as the acting Oregon state archaeologist, confirmed that there is a consensus among archaeologists working in that state that a microblade industry is not present in southwestern Oregon west of the Cascades. This interpretation appears to be erroneous. The Coquille Microblade tradition is a valid technocomplex in this area and appears to have more in common with the Plateau Microblade tradition than with microblade traditions of the Coast.

The Problem of Late (< 2,000 BP) Microblade Technology

Evidence for a distinctive Plateau microblade technology can be reliably dated from ca. 8,400 BP to a least 600 BP on the Thompson and northern Columbia Plateau, as well as in sites found on the central to eastern Cascade Range. It is worth repeating the relevant data from above to illustrate that 37% (7/19) of radiometric estimates on sites containing microcores and fragments date less than 2,000 BP (Table 6.11).

Site types favour small field camps, but also include a few larger residential camps. Some housepit assemblages on major river drainages also exhibit this technology, although usually thought to be the result of component mixing. Greaves' (1991) analysis of mid Fraser–Thompson River microblade site assemblages indicated that upland logistical camps tend to have higher frequencies of microcores and microblades. This is due to their function as expedient cutting tools by mobile foragers. With an increase in semi–sedentary village occupations beginning ca. 4,500 BP in both Plateaus and an emphasis on less mobile lifestyles, the utility of microblade technology appears to have declined except when required in upland hunting and processing camps and stations. Although increasing amounts of resources were put into the Plateau Pithouse Tradition pattern, hunting–processing camps and stations. Although increasing amounts of resources were put into the Plateau Pithouse Tradition pattern, hunting and floral processing activities still required the use of this small, but efficient, expedient technology.

The late persistence of large dart–sized projectile points in many Plateau assemblages alongside smaller, arrow–sized points, appear to indicate persistence of an atlatl technology. The Quiltanton Lake antler atlatl, (site EcRg–Y–1) dated 1950 ± 100 BP (Keddie 2003: 1), comes from the Highland Valley where late use of microblades is apparent (see previous discussions). Mobile foragers in highland areas may have found two weapon systems beneficial. Personal experience with this weapon suggests that atlatls may have been useful in open landscapes such as grasslands and above treeline, whereas the bow and arrow may have been more efficient in closed canopy forests. This is a function of kinesics; atlatl darts requires an erect stance and at least two steps and space to rotate the throwing arm, whereas an arrow can be launched from a bow standing still or even from a crouching position. Atlatl dart points may also have been manufactured from bone or antler points inset with snapped microblades. This may explain the high proportion of snapped microblades in Plateau assemblages, although there is currently no evidence of microblade–inset dart points in Plateau sites.

Despite a historic tendency to dismiss Plateau Microblade tradition evidence that is less than 2,000 years old, evidence continues to mount that such technology persisted in both Plateaus as late as 300–600 BP (Ames at al 1999; ARCAS Associates 1986; Daugherty et al. 1987a; Mierendorf et al. 1988; Dr. G. Nicholas, personal communication 1998). Until the 1980s, most investigators tended to support Sanger's (1968a) assertion that microcores and microblades disappear from the archaeological record by ca. 3,000–4,500 years B.P., although this was based upon a relatively small sample of sites. Similarly, evidence for very late use of this technology in the form of two microblade cores found in possible association with a ca. AD 1400–1830 plank house at the Meir site on the Lower Columbia River (Ames et al. 1999) suggests that this expedient technology did not disappear throughout all areas of the Plateaus until the late pre–contact or protohistoric periods. However, it is not clear if the Meir site microblades are earlier artifacts mixed with refuse from the protohistoric house.

Table 6.11: Microcores and/or Fragments by Region and ^{14}C Age Estimate

	^{14}C	1σ	cores	core fragments	microblades
Thompson	140	80	126	128	4,559
Plateau:	140	50			
	1,120	170			
	3,250	70			
	3,920	65			
	4,220	70			
	6,000	80			
	6,650	110			
	7,670	80			
Okanagan–	1,800	90	46	32	2,173
Similkameen:	2,500	100			
	6,920	100			
Similkameen	7,400	90			
Columbia	105	55	57	5	1,148
Plateau:	800	50			
	1,080	200			
	2,750	75			
	3,090	390			
	6,470	80			
Totals			229	165	7,880
Oregon:	310	50	113	0	127
Coquille	310	70			
Microblade	680	90			
Tradition	1,150	80			
	1,700	80			
	5,859	120			
	8,560	90			
Cascades:	310	90	68	34	1,208
Cascade	650	50			
Microblade	860	90			
Tradition	1,380	110			
	1,430	90			
	1,710	110			
	4,120	130			
	5,200	70			
	5,930	120			
	6,107	178			
	6,445	120			
	6,650	120			
	6,730	70			
	7,730	70			
	7,910	280			

Component mixing has been advocated for most Fraser Plateau sites where associations of housepit floor deposits with microblades or microcores have been reported (see ARCAS Associates [1983, 1986] for the Highland Valley specifically). Stryd (1973) originally thought microblade technology to be absent from Lillooet housepit components dating more recently than ca. 2,800 BP. His later work (ARCAS Associates 1986), however, makes note of in situ microblade technology in some Shuswap Phase (2,400–3,500 BP) housepit components.

To illustrate the problem, at EcRg–02 in the Highland Valley there is a reported Quiltanton Complex, representing an hypothesized late Athapaskan population (ca. 1,000–2,150 BP), association of microblades and cores with a subsurface mat lodge dwelling floor. Radiocarbon estimates of 1,120 ± 170 BP, 1,490 ± 150 BP and 1,920 ± 210 BP are interpreted to represent component mixing or contamination (ARCAS Associates 1983), rather than true Late Period technologies.

Microblades apparently have not been found in situ in Plateau pithouse living floor assemblages. Instead, component mixing is invoked to explain their presence in pithouse floors. Greaves (1991), working in the Subarctic, postulated that riverine sites with microblade components generally pre–date pithouse structures and thus occur in roof deposits due to mixing, since these artifacts also occur in non–pithouse structure portions of these sites. Conversely, Ludowicz (1983: 160) considered associations of microblade technology with cultural depressions as indicative of possible use in winter village situations in the mid Fraser–Thompson rivernie locales, but indicated that they could also derive from mixed, earlier sediments used to construct pithouse roofs. The 2,000 BP housepit floor sub–assemblage from the Snazaist village site (DiRa–20) also lacks these tools (Appendix A). To date, the question of a definite association of Plateau Microblade tradition artifacts with pithouse floors cannot be adequately answered although consensus appears to be that microblades and microcores found in pithouse features are an artefact of roof construction mixing earlier and later site components (contra ARCAS Associates 1986).

It is evident that the majority of reported microblade assembages are associated with non–pithouse, upland seasonal occupation sites and activities (Beirne and Pokotylo 1979; Grabert 1970; Pokotylo 1978; Dr. A. Stryd, personal communication 1994) as well as recent intra–site and intra–assemblage analyses (ARCAS Associates 1983; Ludowicz 1983) of various upland south–central British Columbia sites. Ludowicz (1983: 160) conducted anlyses indicating that microcores were manufactured at base camps and were better represented there, whereas microblades and exhausted microcores were more common in short–term field camp situations.

Chance and Chance (1985: 164–166) refer to technological difficulties associated with working argillaceous silicates at Kettle Falls by classifying small, microblade like flakes as "micro–lamellar" blades in the Mission Point aspect (ca. AD 600) of the Sinaikst Period (AD 300–1400). Similar small, lamellar flakes resembling microblades, some identified as such, some not, occur in the Goldendale site (Warren et al. 1963) and were also recovered from Chief Joseph Dam (Campbell 1985: 304–309) and Wells Reservoirs (Chatters 1984: appendix D, D2) sites. Browman and Munsell (1972: 546–548) recognized a number of Columbia Plateau sites with microblades or microblade–like flakes and microcores. These were sometimes classified as "domed scrapers" at Wenas Creek (Warren 1968: 66, 74), or the "ovoid cutting tool" from Hells Canyon in the Snake River drainage (Caldwell and Mallory 1967: 137, plate 17m). Browman and Munsell (1972: 546) included materials from the Ryegrass Coulee, Indian Dan, Schaake Village, Wenas Creek, and Goldendale sites along the lower Columbia River drainage. Additionally, microblades and/or microcres were recorded from the Potholes, Central Ferry, and sites located in the Lower Granite and Little Goose Reservoirs in Washington as well as various sites along the Snake River and Birch Creek areas in Idaho; and other sites in north and central Oregon (see Browman and Munsell 1972: 546–548 for details). All sites post–date the Mazama ash fall, with suggested age ranges possibly as recent as 1,000 BP. Choquette (1996: 48–50) reported a microblade technology including microcores, core rejuvenation flakes and microblades from DhQj–14 in the Canadian Kootenays that he compared to the early occupation Shonitkwu Period assemblages at Kettle Falls.

Some later coastal components, such as at Hoko River and San Juan/Gulf Islands/Fraser Delta sites, exhibit quartz crystal microblades or quartz microliths persisting to ca. 1,500–2,800 BP (Borden 1970, 1975; Carlson 1990; Connolly 1991; Flenniken 1981; Mitchell 1990). Connolly (1991) indicated that bipolar reduction of small cobbles and pebbles throughout the Glade Tradition (300–9,000 BP) may explain the disappearance of microblade and core technologies in some areas. He may be correct as several researchers (ARCAS Associates 1986; Chance and Chance 1985; Greaves 1991; Richards and Rousseau 1987; Rousseau et al. 1991; Turnbull 1977) report increased bipolar reduction strategies over time from Early to Late periods of the Plateau. Fladmark (1989: 212–216) has also stated that the Transitional Complex of the Queen Charlotte Islands where more expediently produced bipolar cores replaced microblade core technology characteristic of the Early Coast Microblade Complex (Coastal Microblade Tradition) by ca. 4,200–4,500 BP.

Microblade versus Microlithic Techologies

There has been a general reluctance to recognize apparent Plateau Microblade tradition microblades, if they are not associated with microcores, in the northern Columbia Plateau and in Oregon. In both the Wells and Chief Joseph Reservoir sites, Chatters (1986) and Campbell (1985) identify microblades as "small, linear blades", unless associated with microcores. Although small, linear blades may have been occasionally produced during biface thinning techniques (cf. Campbell 1986; Kelly 1984) and hesitated to label them as a true microblade technology. This is a valid concern, although four sites contained definite microcore and microblade associations: 45OK419 (Chatters 1986), 45DO273, 45DO282, and 45DO326 (Campbell 1985). However, these typologies did not include primary microblades (lames à crête). In total, those four sites contained 24 microcores, one (1) microcore rejuvenation flake, and 446 microblades (Table 6.1), or approximately 5% of all microcores and microblades from the Thompson and northwest Columbia Plateau, including the eastern Cascades.

Greaves (1991: 205) recognized the problem of distinguishing between intentionally manufactured, versus fortuitous microblades in her report on experimental replication of microcores and microblades. She determined that it is difficult to distinguish between biface thinning flakes and initial core preparation debitage. However, she also indicated that microblades produced after the fluted surface has been adequately prepared, as well as cores rejected due to internal flaws, and exhausted cores, are all readily distinguishable as microcore and microblade technology. Mackies replicative experiments (Mackie 1987, cited in Greaves 1991: 186–189) support these conclusions, although he was working in obsidian not cryptocrystalline silicates (e.g., chalcedonies and cherts).

Raw material may restrict size, shape, and frequency of microblade separation from cores, as well as the manner of rejuvenating fluted core surfaces. Thus, obsidian seems to correlate with coastal conical core shapes, whereas basalts and cryptocrytalline silicates tend to be associated with wedge–shaped core production. A notable exception is the Subarctic Ice Mountain Microblade Complex where obsidian cores do not conform to conical shapes (Fladmark 1985: 169–181).

Flenniken (1987) points out wedge–shaped cores with fluted surfaces can be produced by bifacial preparation of the core blank. As such, many of the small, linear blades found in sites in the Columbia Plateau with and without microblade cores, may represent initial stages of core production. This seems plausible, especially since the majority of Columbia Plateau microblade cores which Campbell (1985) and Chatters (1986) analyzed were made of cryptocrystalline silicates, which may have required more preparation and re–working in order to produce microblades than those manufactured from vitreous dacites or obsidian. Flenniken (cited in Daugherty et al. 1987a: 73, 84) was able to produce acceptable microblades from cryptocrytalline silicate wedge–shaped cores by experimentation with hand–held cores and pressure flaking implements. This indicates that core retention devices (e.g., Callahan 1985; Flenniken 1987; Hayashi 1968; Kobayashi 1970; Solberger and Patterson 1983; Tabarev 1997) probably represent only one aspect of possible reduction strategies. Microcore keel crushing such as is sometimes evident in the Plateau Microblade tradition, might indicate core retention devices or may simply result from resting the core on a solid surface, or anvil. Dr. M. Magne (personal communication 2000) related a story of an unnamed artifact replication expert who was able to produce microblades by holding the core and prying them off with his thumbnail. Although this is anecdotal, there appears little doubt that there are multiple methods for producing these small tools.

Again, Flenniken's (1981) work with the bipolar microlithic (i.e., non–microblade) technology of the Hoko River site indicates that small, linear flakes with parallel to expanding distal edges can be produced by bipolar pebble reduction. While this technique is not recognized in mid to upper Columbia River sites, a bipolar reduction technique is present in sites in the Coquille and Williamette River valleys (Connolly 1991; Pettigrew 1978, 1980, 1981). These studies list pièces esquilleés (bipolar wedges) as part of the artifact inventory, they are considered to be exhausted bipolar cores (Flenniken 1981). Bipolar cores recorded at the Tolt River site (45KI464) (Onat et al. 2001b: 7.60 to 7.65) may represent a continuum from microblade to bipolar reduction strategies,as was the case in the Queen Charlotte Islands (Fladmark 1989: 212–216), cited previously.

Similarly, Mierendorf et al. (1998: 371) state that a small core and linear flake technology that does not fall within the parameters of microblade technologies in the northern Cascades, forms part of a "non–microblade microlith technology on the Olympic Peninsula." They cite Kennedy and Oda's findings of microblades and "other small flake types" in an assemblage from a high elevation site in the central Cascades of Washington State (Kennedy and Oda 1988, cited in Mierendorf et al. 1988: 371, 427). Debitage analysis of Plateau Pithhouse Tradition and earlier Nesikep Tradition components at the Landels site (EdRi–11) [Rousseau et al. 1991] in south–central British Columbia suggests that the Plateau Microblade technology may have begun to be replaced by a bipolar reduction strategy in some areas (but not the Similkameen) by ca. 2,500 BP. Also, some later coastal components, including the Transitional Complex of the Queen Charlotte

Islands, at Hoko River, and San Juan/Gulf Islands/Fraser Delta sites exhibit quartz crystal microblades or bipolar reduced microliths persisting from 2,800–1,500 BP (Borden 1970, 1975; Carlson 1960; Dr. K. Fladmark, personal communication 2001; Flenniken 1981; Mitchell 1990), indicating a need for quick, expedient and small cutting implements.

A difference between Thompson and Columbia Plateau assemblages appears in the reported frequency of snapped microblades. These are missing either proximal or distal ends (Campbell 1985). The significance of such occurrences may be the result of sample bias or simply reliance on screen mesh sizes that fail to capture a significant number of microblade fragments (Daugherty et al. 1987b), although it is assumed that snapped microblades were used in the manufacture of hafted composite tools (see Chance and Chance 1982: 246, fig. 109; Daugherty et al. 1987a: 123, figure 21; and Tabarev 1997 for illustrations). Munsell (1968: 130) speculated that microblades, snapped or whole, might have been hafted in very soft tissues such as milkwood or tule rush stems – neither of which leave microscopic hafting wear. Croes (1995, 2003) recovered at least one end–hafted complete quartz crystal microblade in the Hoko River wet site dating ca. 2,500 BP, along with several hafted microliths. These were found set in square cross–section wooden handles, split at the top for the microblades or microliths and bound with cedar bark, spruce root or cherry bark (see Croes 1995: 180–183, figures 4.108 to 4.109). All appear to have been utilized for generalized cutting purposes such as processing fish, meat and/or floral resources. Identification of use–wear and residue analyses of small samples of microblades from the Chief Joseph Dam Project and Highland Valley have been reported (ARCAS Associates 1986; Campbell 1985; Greaves 1991; and Rousseau et al. 1991). They support generalized cutting tasks, often of soft tissue that leave few wear marks.

It is difficult to make comparisons among microblade assemblages in the Thompson and Columbia Plateaus because researchers have not used similar analytical or descriptive techniques. An examination of Columbian Plateau microblade and small, linear blade site assemblages utilizing attribute lists and analysis techniques (see ARCAS Associates 1983, 1986; Beirne and Pokotylo 1979; Croes 1995; Flenniken 1987; Greaves 1991; Kelly 1984; Ludowicz 1983; Sanger et al. 1970; and Wyatt 1970) would be required to make meaningful comparisons.

Ludowicz (1983) and Greaves (1991) studied interassemblage variability between riverine and upland areas in the mid Fraser–Thompson River area, including the nearby Upper Hat Creek and Highland valleys. Ludowiczs analysis indicated that upland sites exhibited high frequencies of expedient tools as indicated by frequencies of microblades, core rejuvenation flakes and microcores relative to riverine sites. Interpreting this as evidence for a collector strategy at base (residential) camps, she indicates that this pattern is evidence of a shift from foraging to at least a partial collecting strategy prior to the establishment of visible sedentary villages (1983: 160).

Greaves study of microblade and non–microblade assemblages in the nearby Upper Hat Creek and Highland Valleys equated the presence/absence of microcores and microblades with residential and field camp situations. Microcores were manufactured at residential camps, what Chatters (1984) and Kelly (1988) call "gearing up" for specific tasks. These patterns reflect higher incidences of core preparation flakes in residential camps versus microblade debitage and core rejuvenation flakes exhibitied at field camps where a majority of struck microblades were utilized. She concluded that, while microcore technology was correlated with high residential and logistical mobility in the Highland Valley, it was only correlated with high residential mobility in the Upper Hat Creek assemblages. This pattern emphasizes the utility of hafted, small cutting–edge tools in both forager and mixed forager–colector activities where small multi–purpose tools are of value (i.e. in processing meat and for preparation/processing of floral resourcesas well as composite tool manufacture). She concluded that the microblade industry most likely had a multiplicity of functions (roles) across the range of Plateau environments and settlement–subsistence systems

Support for Greaves' model can be found in the concept of risk assessment concerning stone tools and subsistence procurement. Bamforth and Bleed (1997) and Torrence (1989) point out that risk of tool failure, associated with hunting and foraging/collecting activities while mobile, can be associated with the cost of tool production and maintenance. Similar arguments for portability have been advanced for data from a non–microblade using area (Carson Sink, Nevada). Kelly (1988: 718) suggests biface–thinning flakes served much the same purpose as microblades. Projectile points and bifaces appear to be less costly to produce than microblade cores, given the steps required in manufacture, since microblades serve as insets in more costly composite tools (spears, arrows, hafted cutting tools). Alternatively, microblades may not have been a syncretic technological adaptation in areas outside their known Plateau distribution for cultural reasons.

Basically, the main advantage of microblade technology is savings in weight for mobile foragers. Although wood, bone or antler hafts require a greater expenditure of labour but microblade insets can be produced in quantity from one or two light cores as a maintenance activity. As such, it reduces risk factors by carrying and maintaining both microblade and biface technologies while mobile.

Microblade Technologies and Ethnicity

A tendency to equate ethnicity to microblade technologies, at least within the south–central Interior Plateau of British Columbia, is broached in the above discussions. Hypotheses that microblade technologies were, or might have been, representative of late (post–2,000 BP) Thompson Plateau Athapaskan populations are well documented (ARCAS Associates 1983; Carlson 1996c; Magne 2001, 2003; Magne and Fedje 2003; Magne and Matson 1984, 1987; Sanger 1967, 1968a, 1970a, b; Stryd and Rousseau 1996; Wyatt 1970). Connolly (1991) and Pettigrew (1978, 1980, 1981) found a microblade technology in the Coquille and Rogue River Valleys, areas of ethnohistoric Athapaskan occupation, which supports this view although Sanger 1970a: 108) thought this technocomplex too early (ca. < 9,000 BP) to be identified with proto–Athapaskan populations. Figure 6.14 illustrates ethnohistoric Athapaskan–speaking areas of North America that may indicate their presence for the last millennium if a series of migrations dating to the White River tephra fall is correct.

Microblade technologies also occur in (assumed) non–Athapaskan ethno–linguistic areas, from Early through Middle and Later Period times. Included are the Arctic, northern Northwest Coast (Ackerman 1996; Fladmark 1970, 1975, 1979a,b; 1982, 1986); Central Northwest Coast (Carlson 1990, 1996b, c; Coupland 1996); southern Northwest Coast (Carlson 1990, 1996b, c; Grabert 1979; Matson 1976, 1996); Kootenays (Choquette 1996; Fedje et al. 1995); the eastern side of the Rocky Mountains in Alberta (LeBlanc and Ives 1986; Pyszczyk 1991; Sanger 1968b; Stevenson 1986; Wormington and Forbis 1965), and Andrefsky's (2004) research in the Snake River area. All are historically non–Athapaskan areas in which microblade technology probably represent technological diffusion (cf. Carlson 1996c: 36).

Linguistic evidence (Hoijer 1956; Hymes 1957; Kinkade et al. 1998) suggests an Athapaskan Plateau presence at a time depth of 1,000 years. Non–Athapaskan (Salish and Penutian) populations are thought to have occupied the Plateau prior to this time. Alternatively, Magne and Fedje (2003) suggest population movements of Athapaskans into the Interior along major rivers such as the Fraser and Columbia as early as 7,500 BP. So, depending upon which hypothesis ultimately can be validated, Plateau Athapaskan populations are either fairly late migrants or occur as early as proto–Salish and Penutian populations.

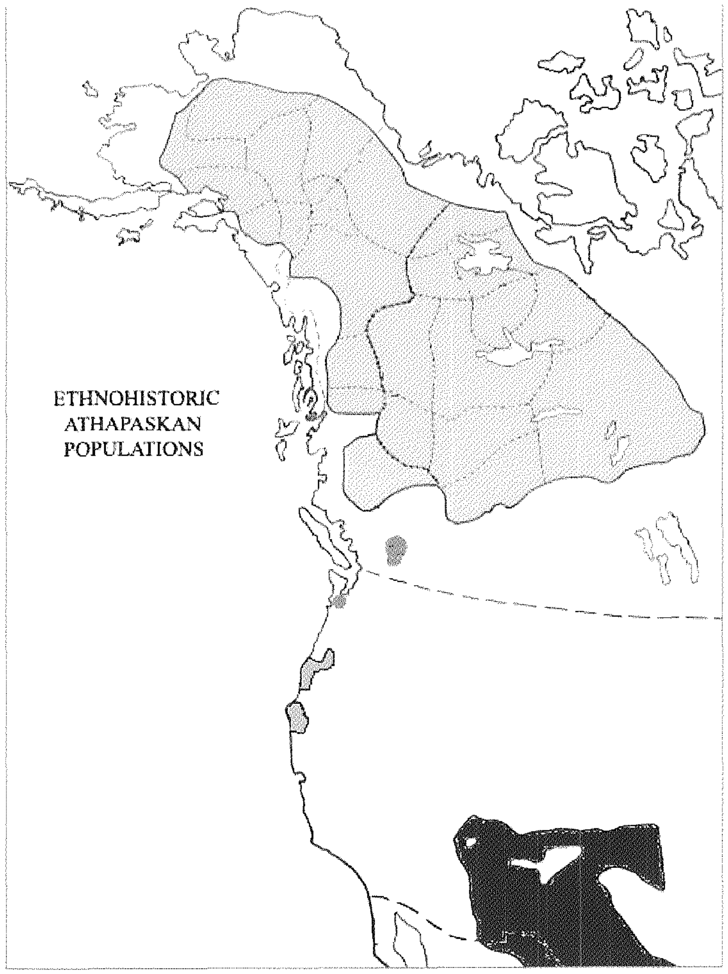

Figure 6.13: Ethnohistoric Athapaskan–speakers
(after http://ehl.santafe.edu/maps/Na–Dene.gif)

Microblade technologies, if they can be branded with an Athapaskan label, occur with some regularity in the Skagit highland and upper Ross Lake areas (Mierendorf et al. 1998); Fraser Canyon (Haley 1996; Pokotylo and Mitchell 1998); mid Fraser–Thompson (Stryd and Rousseau 1996); Okanagan Valley (Grabert 1968, 1970); Similkameen Valley (Copp, see Appendix A); and northern Columbia Plateau along the Columbia River (Campbell 1985; Chatters 1986; Munsell 1968) as well as on the central and eastern slopes of the Cascade Range (Baxter 1986; Daugherty et al. 1987a, b). These areas include Salishan and Penutian–speaking groups today and, according to lexicostatistical studies (Hunn 2000; Kinkade et al. 1998; Suttles and Elmendorf 1963), this has been so for several millennia. The exception is the protohistoric and early historical linguistic evidence for the Athapaskan–speaking Nicola–Similkameen (see Chapter 3, and Figure 6.13 above).

Of note is the hypothesized co–residency of Salishan– versus Athapaskan–speaking populations in the mid Fraser–Thompson river region postulated by Stryd and Rousseau (1996), in which Athapaskan–speaking populations exploited upland valley regions, whereas Salishan–speakers populated river bottomlands. However, unless one assumes an early microblade using proto–Athapaskan population over a wide area historically occupied by other linguistic groups – most of whom Carlson (1979, 1983b, 1990, 1996a, b, c) thinks have been in their traditional territories for millennia viz the Northwest and Coastal Microblade Traditions), other mechanisms may have been responsible for this wide–spread technological phenomenon. These include the previously discussed long–standing cultural interactions through mechanisms such as trade or marriage and stimulus diffusion.

Whichever explanation is favoured, it is evident that associating microblade technologies solely with Athapaskan languages does not necessarily reflect contemporary and past ethno–linguistic diversity across the Pacific Northwest, although it is a hypothesis that certainly bears testing. Carlson (1996c: 36) noted the correlation between Athapaskan and larger Na–Dene territories with early microblade distributions, a pervasive indication that this technology was most likely spread through diffusion to non–Athapasakan neighbours, while not discounting Late Period (ca. 1250 BP) Athapaskan migrations stimulated by the White River ash fall discussed previously.

Microblade Technology: Foraging Versus Collecting Strategies

An alternative to linking microblade technocomplexes to ethnicity is an ecological–functional approach. Examination of radiometrically dated archaeological sites exhibiting attributes of the Plateau Microblade tradition in the Thompson and Columbia Plateaus as well as the Cascade Range, provides an explanation favouring functionality. Both the Thompson and Columbia Plateau patterns appear similar with relatively few sites of any kind (with microblades or not) dating prior to 5,000 BP. Sites increase in numbers from 5,000–2,000 BP and increase again after 2,000 BP. The pattern in the Cascade Range is different prior to 2,000 BP. Relatively few sites pre–date ca. 2,000 BP, but there is an increase after ca. 2,000–600 BP. There are plausible explanations for this discrepancy, ranging from a general lack of sites before 2,000 BP because these upland ranges were not exploited as heavily then, to lack of coverage by archaeologists. A highly plausible hypothesis is that sites increased after 2,000 BP due to more efficient collecting versus foraging strategies, including storage of anadromous salmon, producing increased population densities.

In both Thompson and north Columbia Plateaus, semi–sedentary pithouse or mat lodge clusters (i.e., single to small villages) generally post–date 5,000 BP (Ames et al. 1998; Campbell 1985; Chatters 1984; Richards and Rousseau 1987; Wilson et al. 1992; Stryd and Rousseau 1996). Researchers in both plateaus attribute this increase in semi–sedentary occupations to increasing utilization, and dependence upon, storable food sources. Storable food sources such as roots, berries and salmon often have been invoked for the intensification of Plateau cultures – especially those situated on, or in close proximity to, major salmon–bearing watersheds such as the Columbia and Fraser River systems.

The pattern of radiometrically–dated sites in the Plateau suggests an increase in occupation, hence population, with increased sedentism from 4,200–3,200 BP (Chatters 1995). Both Plateaus exhibis increases in sites ca. 4,400–3,800 BP (cf. Andrefsky 2004: 30; Rousseau 2004: 13) and, after a hiatus in the Columbia Plateau, again ca. 3,000–2,200 BP (Chatters 1984). These peaks may correlate with increasing sedentism associated with an increasing emphasis on fish and other storable foodstuffs within river valley systems. Increased sedentism is correlated with a decline in expedient tool manufacture, especially in village residential sites. Microblades are extremely useful in foraging situations due to their high cutting edge to weight ratio of cores to blades, and their functional flexibility (cf. Greaves 1991). With a decline in mobility, it is suggested that microblade technologies also declined relative to the use of expedient flake tools (unretouched, utilized and retouched flakes and cobble spall tools). Thus, collector–mode strategies, with increasing sedentism, acted against the continued use of the microblade industry, except for those sectors of the population who continued to forage in areas other than those in close proximity to salmon streams and villages. A suggested environmental stimulus for increased sedentism in seasonal villages that do not display microblade technology is advocated. The shift from a foraging to a collecting strategy can be correlated with environmental change, particularly in the more xeric northern Columbia Plateau ca. 5,500 BP or later.

Ames (1998), Ames et al. (2000d), and Chatters (1995) correlate an apparent gap in village chronology along the northern Columbia River with increased sediment loads resulting from climatic shifts to more moist conditions ca. 3,000–3,500 BP. They argue that sedentism based on stored foods may have been interrupted during warmer temperature regimes as decreased precipitation lowered river levels and increased water temperatures. Salmonid species are very susceptible to both conditions. Declines in salmonid capture may have required a return to an earlier foraging subsistence pattern during this period.

Jaehnig (cited in Babitt 2000) suggested that a discontinuity in radiometric estimates is a more plausible explanation for the 500–year hiatus. He contends that the hiatus may represent a "plateau" in radiocarbon reservoir factors and not, in fact, the cessation of village life. Alternatively, a centuries–long disruption of storable salmonid resources may have had the effect of moving villages away from river terrace locales into upland areas. Mid–Columbia River archaeological CRM surveys have mandated river terrace and related areas, not uplands. Since Chatters' (1995) data are based on less than two–dozen village sites, this is a plausible explanation, but so is a return to more mobile non–village lifestyles. Only systematic surveys in upland areas away from the Columbia River lowlands will answer this. Foragers may engage in limited collecting strategies, just as collectors continue to rely upon some foraging practices. As such, the archaeological record should support sites characteristic of forager–collecting and collecting–foraging data. These include all types of sites from field and residential camps to semi–sedentary winter villages.

The pattern in the eastern Cascade Range and Canadian Similkameen Valley, both noted for a lack of salmonids, is interpreted as a continuation of the basic foraging (hunting and gathering) patterns in upland areas, since sites continue to emphasize a microblade industry, whereas salmon–rich regions (i.e., especially housepit village sites) indicate a declining usage of this technology. Climatic changes, especially warm–dry Altithermal to later warm–moist or cool–moist temperature shifts, are hypothesized to have little impact on human populations on the eastern flanks and uplands of the Cascade Range. Bioecological information presented in Chapter 2 indicates that floral and faunal communities only shifted as much as ± 100 meters in elevation depending upon climatic changes (Pellatt 1996). Table 3.2 illustrates the number of animal species present in extant bioecological Similkameen Valley zones. Although some animal resource species are sensitive to open versus closed–canopy forest regimes, contemporary forest cover in the valley varies from completely open to closed canopies. Upward shifts in bioecological zones during the Altithermal would have produced open or partially closed canopy conditions in areas of modern closed canopy – especially the mid– to upper–elevations of the Cascade and Okanagan Ranges. Species that favour open canopy forests include most of the Artiodactyls (deer, sheep and goat). Post–glacial warmer, moister temperature regimes would allow movements of these species down or across slopes as well as north or south. The development of more closed canopy forest regimes, such as those being experienced currently, would cause a retraction and limitation of these resources. Populations of foragers or forager–collectors would have adjusted their settlement patterns in accordance.

Since the Similkameen Valley exhibits high bioecological resource variation north to south and in terms of elevation today, as it has at times in the past, then it may always have been an area of limited sedentism. Ethographically recorded villages are scarce north of the Ashnola River. Most cluster in the more arid southern valley, especially near the ecotone between steppe–prairie and forest at Keremeos Creek and the Ashnola River confluences with the Similkameen River. Both areas are closer to areas south of Squantlen Falls in the United States where salmonids were available. Consequently, it is postulated that semi–sedentary villages were more limited in areas of the valley north of the Keremeos Creek–Ashnola River areas and that upriver portions of the Similkameen may have been been partially depopulated in the Fall and Winter by families moving to villages south of the 49th Parallel where salmon were available, at least in mid–to–late precontact times. Village sites may once have been present in the Princeton Basin. However, any evidence of these has long since been eradicated by industrial development of river terraces between the confluences of the Similkameen and Tulameen Rivers and suitable areas downstream.

A collector strategy in areas with sufficient root and fish for winter storage obviated the need for the more expedient microblade tools required by mobile foraging (cf. Kelly 1988: 719–721). However, segments of a collector–strategy population may have continued in a foraging mode, especially if needs driven by increased population size required extended forays into upland forests. This may explain the infrequent occurrence of microblade technology in seasonal village sites. As storable roots and anadromous salmonids are stable, predictable resources required for village over–wintering the relative lack of storable protein (especially anadromous salmonids) in the Canadian Similkameen required an increased emphasis on hunting and stored roots for survival in winter. Consequently few winter villages are present. A dependency upon earlier foraging subsistence strategies not tied to winter storables would have contributed to the retention of microblade technologies in this area.

Chapter Summary

The Plateau Microblade tradition can be correlated with foraging and mixed foraging–collecting strategies dating from at least ca. 8,400 to 600 BP, or later. The relatively rare occurrence of microcores and microblades in residential camps and villages associated with storage and sedentism is considered to be a function of a replacement of expedient tools, especially microblades, by simple flake tools in such settings. Microcore size and the capability of producing dozens of small cutting tools from each core, indicate that their value was in providing multi–purpose cutting tools in situations where low weight and mobility were valued over heavier, curated tool forms. These situations include hunting and gathering activities conducted by generalized foragers or by a foraging component operating within an overall collecting strategy. As such, the Plateau Microblade tradition is reaffirmed as a valid technological tradition (or technocomplex) throughout the Interior Plateau of southern British Columbia and northern Washington, including the east flank of the Cascade Range. Whether, or not, microblade technology can be correlated with Athapaskan–speaking populations is a question for the following chapter however, the available data indicates this technology was present from early Holocene times in the Similkameen Valley, as well as the Columbia and Thompson Plateaus.

– CHAPTER 7 –

ETHNICITY AND THE ARCHAEOLOGICAL RECORD

The presence of a protohistoric Similkameen–Athapaskan (Stewix), population has been discussed in earlier chapters of this thesis. Documentary evidence indicates a time–depth of at least 200 years for Stewix–speakers, with earlier populations hypothesized, possibly on the order of several millennia. As such, the problem of identifying specific ethno–linguistic populations in the archaeological record must be addressed. Ethnicity, archaeological ethics and political concerns among archaeologists and indigenous peoples are issues of concern (cf. Creamer 1990: 130–140; Singleton and Orser 2003: 143–152; Smith 2004: 16–57; Tarlow 2006: 199–216; Watkins 2000, 2003: 129–141, among others). Past Athapaskan–speaking populations in the Similkameen valley must be considered in light of other lines of investigation including biogenetics, ecology, linguistics and archaeology.

Early 20th Century archaeologists in the West tended to equate archaeological material culture markers with ethnicity (Trigger 1989: 182–186, 244). The identification of ethnicity from the archaeological record has been renewed over the last few decades with the rise of post–processual schools of thought and the implementation of landscape archaeologies (cf. Kohl 1998). However, equating material culture and ethnicity remains fraught with difficulties and not simply because of the fluid nature of ethnicity as a self–identifying variable by any number of indigenous peoples and/or polities. In order to address the identification of a Stewix presence in pre–contact Similkameen Valley sites it is necessary to discuss the nature of potential ethnic, material culture identifiers.

What is prehistoric ethnic identity? This is a fundamental issue for contemporary archaeologists. Indeed, a fundamental question is whether archaeology as a field is even capable of distinguishing ethnic traits from a pre–contact, non–ceramic archaeological record. An ethnic group may be defined as "a self–perceived group of people who hold in common a set of traditions not shared by others with whom they are in contact" (De Vos 1975: 9). Traditions refer to discrete cultural behaviour patterns that continue diachronically across generational time and would include language as a primary defining trait. Traditional behaviours tend to include shared patterns of subsistence strategies, social organizational variables usually dealing with kinship, and ideological or worldview beliefs about the nature of reality in addition to linguistic commonalities. These shared patterns of behaviour and beliefs provide an historical continuity to the emic perspectives of "us" versus "them" which is a hallmark of an ethnic group. Such patterns also provide a sense of boundedness, or boundaries between territories (shared or not) perceived to separate ethnic groups. These boundaries need not be physical in the sense of geographic ranges, but could take the form of linguistic or ideological differences that serve to distinguish groups. Boundaries are important for contemporary ethnic groups, but they may not have been so for pre–contact populations, as the socio–economic–political issues were not comparable (cf. Meskell 2002: 286). It is questionable that pre–contact foraging groups 7000 years ago were concerned with defining and mapping traditional territories to the same extent as required currently for land claims and Aboriginal rights issues.

In Chapter 3, the identity of ethnohistoric populations residing within the study area was presented using etic criteria including linguistic affinities and locations within specific watersheds. This is the etic perspective based upon ethnolinguistic and other socio–economic–political affiliations established by anthropologists and archaeologists. However, the emic perspective presented by the Okanagan Nation Alliance (2000) differs slightly from the etic taxonomy (Table 7.1), although criteria used for self–identification are not provided:

Table 7.1: Ethnohistoric Interior Salish Emic and Etic Cultural Affiliations

Emic (Okanagan Nation Alliance)	Etic (non–First Nation)
Okanagan (*Syilk*): *suknaqinx* (North)	Northern Okanagan
senq'a?tikw (South)	Southern Okanagan (*Sinkaietk*)
Similkameen/Methow: *smelqmix*	Similkameen Okanagan: Similkameen Athapaskan (*Stewix*); and Methow
Slocan: *sen?ickstx*	Lakes (*Senijextee*)
Arrow Lakes: *s?alt'ikwet*	Lakes (*Senijextee*)
Colville/Kettle: *senxwya?lpitkw*	Colville
Sanpoil: *senp?wilx*	Sanpoil–Nespelem
	Sinkiuse

It is evident that there are situational differences between the taxonomies enlisted by the scientific and Aboriginal communities. The etic perspective includes language as an obvious criterion, but includes other cultural variables including location – usually defined by watersheds. The emic perspective appears similar, but differs in some aspects. A specific example is the equation of Similkameen and Methow "peoples" (identified by contemporary Okanagan–Similkameen). Most likely this is due to the ethnohistoric story (Chapter 3) where a Methow hunting party contributed to a pre–existing Similkameen cultural mileu, although there is no mention of the Similkameen–Athapaskans (Stewix). This may be due, in part, to concerns held by contemporary Similkameen that identification of a different ethnolinguistic group might have a negative impact on land claims.

Until recently, archaeologists seem to have adopted the dogmatic premise that ethnic identity can be directly correlated with material and social aspects of the archaeological record. While this may be validated through careful investigation and correlation of the archaeological record, if viewed within the context of socio–cultural theories on the nature of ethnic identity, there appears to be a bias, intentional or otherwise, that ethnicity equates to single cultural traditions in the broadest sense of the word. This equation of ethno–archaeological identity appears to be most easily assigned to historic cultures, whether they are relatively simple foragers or complex nation–states. These labels assume that both cultures consisted of single, homeostatic cultural traditions rather than complex, ever–changing social networks of populations with wide ranges of individual and sub–population degrees of behavioural and adaptive variation. Historic Iroquoian ceramics as ethno–linguistic identifiers are a good example (Pendergast 1981). These labels assume that both cultures consisted of single, homeostatic cultural traditions rather than complex, ever–changing social networks of populations with wide ranges of behaviourial and adaptive variation. However, as Jones (1997: 100) indicates, identification of ethnicity is more fluid in practice ...

> Ethnicity is a multidimensional phenomenon constituted in different ways in different social domains. Representations of ethnicity involve the dialectical opposition of situationally relevant cultural practices and historical experiences associated with different cultural traditions. Consequently *there is rarely a one–to–one relationship between representations of ethnicity and the entire range of cultural practices and social conditions associated with a particular group.* (emphasis added)

There is value for pre–contact ethnicity or ethno–linguistic identification by language sub–family and/or family that may be roughly equated with archaeologically defined cultural traditions. These span several millennia (cf. Hunn 2000; Kinkade et al. 1998: 67–69) for Athapaskan, Salishan and Penutian archaeology in the Plateaus. However, a lack of ethnohistoric congruence is evident in Table 7.1 and Figure 7.1, indicating that emic and etic criteria vary depending upon cultural references and interpretations of defining variable significance.

Taxonomic means of classifying societies tend to follow a more–or–less rigid econonomically–based hierarchy, which ranges from foragers, through complex or transegalitarian collectors, pastoralists, horticulturalists, agro–pastoralists, fishers, agriculturalists to industrial levels of ever increasing complexity (cf. Fried 1975: 32–35; Service 1971). This hierarchical model is based on modes of subsistence, production, distribution and consumption of resources, and levels of social organization ranging from bands, through tribes (also known as segmentary lineage societies), chiefdoms to state–associated levels of authoritarian control. Such control is most evident at the levels of chiefdom and state, but relatively lacking for bands and tribes (Arnold 2004: 171–181; Bettinger 1991: 1–29).

Co–resident, hunting and gathering groups sharing common territory, language and kinship (i.e., bands) may be generally perceived to be a single cultural, hence ethnic, tradition. Such views are based upon variables characterized by shared language, traditions, worldview, subsistence strategies and environmental variables distinguishing groups. The etic viewpoint has generally been to classify foragers as discrete units event thought they were characterized by dispersed groups of co–resident families operating within discrete territories. Territoriality may be more a perception of control over resource areas than discrete physiographic and/or geographic areas with permanent boundaries. Territory is a flexible concept varying with changing environmental, subsistence and social variables. This was probably the case in a majority of foraging societies.

From an emic perspective, band members refer to themselves as people of specified, but flexible, geographic regions (Anastasio 1972; Chance et al. 1977: 255–268). From an etic perspective, they can be considered as separate from all other such groups. These could be defined as ethnic groups because they practised reciprocal exogamy and patrilocality with others like themselves, even though they were relatively free to change residential affiliations. However, 20th century nation–state emic perspectives assume such small groups to be ethnically unified even when the people concerned may perceive no affiliation beyond the residential band level. One must be careful not to confuse the concept of ethnicity, mainly defined by ethnolinguistics and partially defined by emically–determined behaviourial and physiographic boundaries, with social differences that define kinship or kin–based associations in band–level societies. Kinship groups perceive themselves to be interdependent units of society whereas ethnic groups perceive themselves to be independent units distinct from all other such units (De Vos 1975: 9). Even populations sharing territory, language and common behaviours may fracture along self–identified social boundaries, defining themselves as ethnic groups distinct from their neighbours. Such is the case with the Tutsi and Hutu (pastoralists versus agriculturalists) of Rwanda (Lowe et al. 1997). As to the converse, the Hupa (Athapaskan), Yurok (Algonquian) and Karok (Hokan) live in northern California along the Klamath and Trinity River valleys. Despite speaking unrelated languages, they live very similar lifestyles and it is difficult to determine from which many artifacts, hence ethnic affiliation, derive (Dr. R. Carlson, personal communication 2006).

How then would archaeologists identify the ethnicity of two such differing polities? Minor differences in lifestyles across geographic space might be deduced (or inferred) to be of ethnic origin, especially if the overall patterns of subsistence–residential spheres indicate a commonality of life–style. These commonalities, at least for past foraging societies, tend to be extracted from the archaeological record through minute variations in shared artifact types (cf. Helmer 1977; Ives 1990; Magne and Fedje 2003; Magne and Matson 1987). Residential units, for example, present a much more difficult situation in terms of deducing ethnic identity primarily because differences in subsistence, settlement patterns, ideology and architectural features are on a much smaller scale. As these units appear to represent a more homogenous, patterned life–way because of the observable organic cultural patterns (as opposed to the primarily inorganic record of the archaeological past), it would be likely that they would be assigned a single ethnic identity.

The archaeology of the Similkameen presents an analogous situation. Except for the Snazai'st Village (DiRa–20), all investigated sites represent field camps or small residential camps characterized by a foraging subsistence strategy. The primary subsistence strategy represented by field camps and seasonal residential camps was hunting and gathering. As such, it is expected that assemblages would reflect continuity in terms of the types and densities of artifacts and features, given the common nature of site function across time. Camps represented highly mobile groups where individuals employed expedient technologies (as discussed in previous chapters). Given the combination of function (hunting/gathering) and high mobility emphasizing expediency, then it should not be surprising that projectile point styles changed across time and space, but other technological attributes varied only slightly (i.e., microcores, microblades, flake cores, and core reduction strategies). Since projectile points have been found to be reliable indicators of temporal change, it is not surprising that they also have been considered as indicators of ethnic boundaries or territories (see discussion below).

A problem with the etic distinction of ethnicity is due to the way in which archaeologists and other social scientists perceive and arrange data into apparently coherent patterns that presumably reflect differences in patterning across time and space. Typologies of archaeologically defined cultures tend to focus on presumed evolutionary differences that are inherently unilineal (band to state, and forager to industrialist). Because of this analytical framework cultural differences such as ethnicity have tended to be of minor concerns in the study of the past. Today, the rationale for discussing ethnicity among prehistoric hunter–gatherers in Canada, as elsewhere, has more to do with the establishment of Aboriginal rights and Aboriginal title and land claims and other political issues, than theoretical ethnic identity or issues concerning cultural evolution and adaptation.

We ask questions concerning the "why" and "how" of cultural evolution but rarely concern ourselves with the complex ways cultures are integrated in terms of the social polities and sub–polities from which they are constructed. That this is beginning to change is evident by a number of recent publications attempting to deal with such questions (cf. Gathercole and Lowenthal 1990; Hodder 1982a,b; 1989, 1991; Shennan 1989: 1–32; Ucko 1990: ix–xxx). Archaeological studies tend to the diachronic perspective and should allow for sufficient time to track "ethnic" trends. By developing methodologies that control temporal variables correlated to material culture and environments, then identification and analyses of sub–cultural or ethnic factors influencing cultural development should be possible.

Hunter–gatherer Ethnicity and the Archaeological Record

Until anthropological research indicates otherwise, pre–contact foraging societies in Northwest North America will be assumed to represent a traditional etic framework of uni–cultural ethnic polities characterized under the rubric of the generalized terms "band","tribe", and "chiefdom". These can, and have been, identified in the cultural anthropological and archaeological record according to established criteria, such as culture area variables, linguistics, physical anthropology, settlement patterns, land–use patterns, material culture studies, art and semiotic analyses, ethnological, and ethnohistorical studies, as well as ethnoarchaeology. Past identification of ethnic groups in the archaeological record of Northwest North America have been based on contrasting historically–defined, or etic, culture area geographic and ecological variables, with historic linguistic groups and similarities in subsistence strategies and/or material culture (e.g., Kroeber 1939; Suttles 1990). The imposition of an etic typology has been considered necessary due to a lack of agreement among contact period native populations about cultural relatedness. While general agreement exists among anthropologists as to the utility of the band and chiefdom (complex societies) classifications, less congruence is evident at the definition of the tribe or segmentary society (i.e., transegalitarian) level (Fried 1975: 32–35).

Recent theoretical perspectives have shifted away from such evolutionary–linear frameworks to focus on variation observed within and between classificatory units. Binford (2001) for example, stresses subsistence security (population density versus carrying capacity) of foragers and forager–collectors. He examines how stress and risk– reduction strategies contribute to social stratification. That is, generalized foragers practice balanced reciprocity and have low population densities and carrying capacities, whereas complex forager–collectors practice more negative reciprocity with higher populations, carrying capacities and hierarchical elite social strata (cf. Hayden 1992: 526). It is beyond the scope of this discussion to resolve this problem, but it is important to point out that theoretical disputes, such as the identification of the taxonomic level of an historic and/or pre–contact society, predispose researchers to think of the database within constrained limits. This however, is the nature of scientific inquiry, although a more multi–dimensional model of the nature of human societies is clearly called for (cf. Jones 1997: 100).

In terms of the area in question, portions of the Pacific Northwest and Interior Plateau culture areas have been divided by languages – Athapaskan, Salishan and Sahaptin families and sub–families (Suttles 1990: 5, Thompson and Kinkade 1990: 30–35) – as well as by physiographic provinces; the Plateaus. However, as already noted, archaeological material culture does not necessarily clearly reflect equivalent ethno–linguistic classifications for these groups. These historic linguistic families and their geographic social correlates ("ethnic environments") can be shown to have inhabited specific regions or territories. For example, ethnohistoric Athapaskan speakers are known to have occupied the northern Interior Plateau to the more northern region of the province, in an ecological zone roughly equated with sub–boreal and boreal forests. This is the Athapaskan ethno–linguistic ("ethnic") region from which they expanded south at various times in the past and ultimately adapted to non–boreal forest ecozones (Magne and Fedje 2003; Workman 1977).

South of this area, from the western margins of the Kootenays to the southern Northwest Coast and extending to the Columbia River region of Washington State, is the Plateau Salishan ethno–linguistic/ethnic region. Mid– to Lower Columbia River ethno–linguistic groups fall within the Sahaptin family of Penutian languages (Kinkade et al. 1998: 51, 58–61). The material culture typological system commonly employed for the Plateau is *assumed* to have existed for several centuries to several millennia (Hunn 2000; Kinkade et al. 1998: 67–69).

In order to test the assumed cultural discreteness and ethnic integrity of ethno–linguistic group correlates, a multi–disciplinary approach is required. The establishment of ethnic identification may be possible from detailed studies of the archaeological database (even though it is known to be incomplete) in relation to the subdisciplines of historical linguistics, oral traditions, ethnography, ethnohistory, ethnoarchaeology and forensic anthropology, especially ancient DNA (aDNA) studies. The latter data might provide distinctive Athapaskan, Salishan and Sahaptin biological signatures for pre–contact populations. For example; an attempt towards this was made on the 9000–year–old Kennewick remains from Columbia Park, Washington, but proved unsuccessful (Smith et al. 2000). On the other hand, the Kwaday Dan Ts'Inchi mummified remains from British Columbia dated ca. 556 to 600 BP, although not subjected to aDNA study at the time of writing, exhibit potential for this line of analysis. Hackenberger (2000) reviewed bio–archaeological studies up to AD 2000, but none had produced results for Plateau populations based upon DNA evidence. The recent (AD 2006) recovery of ca. 700 BP human remains from the Similkameen Valley (site DhQw–35, see Appendix A) is a likely candidate for aDNA studies although these are only in initial stages at the time of writing.

Only through multi–disciplinary approaches can archaeological correlates of peoples who hold in common self–perceived behaviourial and territorial differences from other such groups (De Vos 1975: 5–41), including linguistic variables, be satisfactorily derived. This requires the combination of the etic, or scientific hypothetico–deductive approaches of archaeology, anthropology and related disciplines, as well as an appreciation and respect for the native emic perspectives of the descendants of the peoples who left the archaeological record. That there may be clashes in such perspectives between social scientists and some Aboriginal peoples is to be expected. Cultural relativism insists that social scientists respect the native, or emic, perspective of history and prehistory, but it does not mean a cessation of the scientific perspective. An archaeologist caught in such a situation may attempt to present the etic perspective to synthesize a common ground, hoping that the archaeological perspective will be syncretized into native perspectives, or simply realize that real differences in perceptions exist and refrain from proselytizing.

The correlation of archaeological cultures with ethno–linguistic groups in the Pacific Northwest has been promoted mostly by Carlson (1979, 1983, 1990, 1996c) with the early distributions of different technologies correlating with different ethno–linguistic groups: foliate biface and pebble tools with Salish–Wakashan, intermontane stemmed points with Penutian, and microblades with Na–Dene speakers. Cressman (Cressman et al. 1960) had previously linked the earliest component at Five Mile Rapids to Penutian speakers, and both Borden (1968) and Dumond (1969) had linked microblades to Na–Dene speakers. Carlson's (1996c: 215) contention is that these correlations are only valid for the period of initial settlement, before the processes of acculturation and borrowing levelled technological differences among founding populations.

The Nature of Ethnic Variables.

Historic large–scale social groups of British Columbia have been commonly referred to generically as "tribes" or "chiefdoms". These polities are also labelled by linguistic terminology. These can be self–identifiers (e.g., Haida, Tlingit, Okanagan) or applied by others (e.g., Chaudière, Nez Perce). The merging of ethno–linguistic and geographic regions into assumed ethnic territories has been discussed above. The term "band" has been retained in reference to specific regional polities, a result of the implementation of the Canadian Reserve system developed after AD 1885.

Ethnological Data. Ethnological data includes documents that record specifics of native cultures in written form. These are logs, journals and diaries of Eurocanadian explorers, traders, missionaries, settlers and others who came into direct contact with Aboriginal peoples in the 19th century as well as later writings by and about native peoples. These sources include those of early anthropologists, as well as records written by literate Aboriginal peoples and provide a more diachronic perspective. Ethnohistoric documents form an important record of early and later native cultures of the province. Archaeologists and anthropologists continue to use ethnographic information to help their understanding of remote cultural times. However, the nature of that information must be carefully considered in terms of accuracy and consistency. Such critical ethnographic source analysis is necessary to understand how information becomes established as "fact" even though it may be questionable (cf. Jones 1997: 1–5; Simonsen et al. 1997: 22).

Ethnographic source analysis is a method by which historic documents are viewed critically and analyzed for possible flaws, such as small sample size (few informants), or whether the informants were reliable or even qualified to discuss certain aspects of their culture. Detailed observations of contact period Aboriginal cultures were made and recorded, but how much of those records are an accurate and dispassionate record of the times? Source analysis requires an examination of the information recorded by ethnographers or non–academic observer for sources of bias. For example, one must determine the nature and type of their training accomplished, as well as research design. James Teit (1900, 1930) is the source of numerous oft–referenced ethnographies of Salishan peoples. Trained by F. Boas and his associates, Teit produced these ethnographies under the editorial scrutiny of Boas.

Teit was not an academic, in that his livelihood did not depend upon his ethnographic studies. His value as a field ethnologist derives from his marriage within the Nlaka'pamux First Nation and his fluency in their language. This allowed him a rather unique position between a field observer and collaborator for Boas, and a participant in his wife's culture during a time of change and stress. In Teit's obituary, Boas (1922: 490–491) stated that the quality of his work was "full and accurate" because of his fluency in the languages of the area and that "practically our whole knowledge of the material culture, social organization, customs, beliefs and tales ... is based on his work." Although his major works involved the Thompson (Nlaka'pamux) and Shuswap (Teit 1900), he also produced significant works on other Salishan peoples, notably the Okanagan, Sinkaeitk (South Okanogan), Sanpoil and Nez Perce (Teit 1930). Of significance for contemporary scholars was his penchant for relating all the cultural activities of these peoples to the Thompson. Consequently, his ethnographies may be biased by his use of the Thompson as a comparative base. This may, or may not, have obscured significant cultural differences between groups given that Teit observed more similarities than differences among Plateau groups.

The ubiquity and impact of Teit's work can be illustrated by the following anecdote. The author was conducting an Archaeological Impact Assessment study of portions of Nicola Tribal Association territory north of Okanagan–Similkameen lands. The study required the active input and participation of a Nicola elder, who represented a repository of traditional knowledge and who was familiar with such archaeological projects from previous participation in a number of them. The elder consistently provided information when asked and volunteered other information, including myths concerning the local landscape. However, on some queries he deferred answering for some time, usually several days. After one such hiatus, he admitted he had waited to answer specific queries until he could consult his major source. This source turned out not to be another elder, but the works of James Teit! Teit's work has come full circle. His information, derived from First Nations' informants, has in at least one case, become Aboriginal "traditional knowledge", or "read back" (Dr. G. Nicholas, personal communication 2006).

The second primary ethnographic source for the Salish was Charles Hill–Tout. Unlike Teit, he was an academic trained at Oxford. However, like Teit, he was an avocational anthropologist. He appeared to have alienated Boas, but his reports to the Ethnological Survey of Canada were recognized in their own right (Maude 1978: 16). He produced ethnographies of the Thompson (Hill–Tout 1900) and northern Okanagan (Hill–Tout 1911), although he did not have the advantage of being a "marginal native", like Teit in that he had little linguistic facility of local languages and preferred to work with indigenous English–speaking informants (Wickwire 1993: 554).

Hill–Tout (1911: 131) agreed with Teit's use of the Thompson as a comparative base, stating that the Okanak'en (Okanagan) "culture followed so closely that of the neighbouring divisions, that a description of one is virtually a description of another. Teit's account of

Thompson culture might have been written, with a few minor and unimportant points of difference, for the Okanak'en." He disagreed with Teit's findings of a "non–hierarchical, non–hereditary and consensus–based political structure" (Wickwire 1993: 554), referring instead to a form of paramount chiefdom system most likely instigated by Eurocanadian authorities and/or through the influence of the Church.

Of the two, it would appear that Teit's information is a more reliable record of early contact and protohistoric cultures, given diachronic studies conducted in informants' language. However, Hill–Tout's data are also important as they provide a counterpoint to Teit in terms of impacts of colonialism on native cultures of the area.

Ethnicity and Archaeological (Cultural) Units.

Archaeologists often develop local and regional cultural–historic models or culture history sequences by synthesizing large cultural analytic units (phases, complexes, stages, patterns, traditions and horizons). While the concept of the phase (Willey and Philips 1958: 22) forms a necessary understanding of etically–derived patterns across time in a specific, limited regional area, the broader units are attempts to create synthetic, generalized patterns of pre–contact culture areas.

Richards and Rousseau (1987) created major analytical units for the Late Pre–contact Plateau Pithouse Tradition as a partial replacement of Sanger's (1970a) later Nesikep Tradition in the south Fraser Plateau. This tradition ties together regional differences in settlement–subsistence patterns and bioecological zones, based on a common pattern of pithouse villages dependent upon intensive salmon exploitation and/or root gathering. Internal cultural changes are characterized by three regional horizons; Shuswap (3,500–2,500 BP), Plateau (2,500–1,200 BP) and Kamloops (1,200–200 BP).

Fladmark (1982) created synthetic–analytic cultural historic units stressing adaptive differences expressed in site assemblages and components from differing bioecological, physiographic and historic culture zones that may be lost within the larger units. His view of the Plateau culture area is one of a mosaic of cultures, past and present (Fladmark 1982: 124–125) in which populations found themselves resident within specific areas (i.e., watersheds) separated by mountainous terrain. Fladmark hypothesized that micro–cultural units separated, but not isolated, from one another may be "the only typical long–standing regional pattern" in the Plateaus. As such, he divided Plateau prehistory in terms of three large–scale diagnostic periods: Early (8,000–10,000 BP or earlier), Middle (8,000–3,500/3,000 BP) and Late (3,500/3,000 to historic).

Historical, non–ethnographic, records also may be suspect, in the sense that they were written by people who may have considered themselves to be of a dominant culture relative to the people about whom they were writing. Consequently, these reflect colonialist attitudes of the times, especially during the decades when the Reserve system was being established (Wickwire 1980: 62–67, Simonsen et al. 1997: 22). It resulted in the disenfranchisement of native peoples from traditional resource areas. Political–economic biases of the fur trade era, which preceded Eurocanadian settlers in the province, naturally were reflected in the official journals of Hudson's Bay Company factors. When native peoples are mentioned, they are usually engaged in commercial activities. Although less visible in official journals, private journals indicated the importance of native individuals and communities to the trade – especially since many of the Company's men were the recipients of preferential trading relationships established as a result of common–law marriages with native women. These writings should be viewed from the perspective of the social contexts of the times in which they were written. However, such ethnographic and historic documents do provide useful information about contact period settlement patterns and land–use data, which can be compared to the ethnographic present, as well as the archaeological record. Of particular utility are 19th and early 20th–century maps documenting historic settlement, land–use and reserve patterns.

These examples illustrate that the ethnographic and historic writings about native peoples must be analysed and re–interpreted with respect to the social, political, economic and moral systems of the times in which they were written. Non–critical acceptance of archaeological, ethnographic and historic documents means incorporating past biases into current understanding of the historic native context. That error allowed Chief Justice McEachern to dismiss Gitskan Wet'suwet'en land claims in the Supreme Court of British Columbia (McEachern 1991; see also Fisher 1992 and Riddington 1992). In his decision, McEachern appears to have accepted 19th century *opinion* as *fact* without considering the perspectives (*habitus*) of the times. The 19th century written testimony of fur traders and other chroniclers of native life often tells us about the colonialist and essentially imperialist and ethnocentric attitudes of the writers and the culture from which their opinions derive, as well as native culture.

Ethnolinguistics and Cultural Affiliation

Diagnostic lithic and organic artifacts (e.g., projectile points, carved wooden objects) are often used to distinguish native polities and cultures in British Columbia. Such material culture traits are thought to reflect relationships among First Nations' languages, cultures, and territories. However, it may be an erroneous assumption to equate linguistic congruence with cultural or ethnic identity, especially for historic Plateau peoples operating at the band level of society. These relationships reflect a non–native, essentially 19th century Euro–centric perception of the nature of social–territorial relationships. Both Athapaskan and Salishan language families include a great deal of linguistic diversity. It is at the level of the sub–family that cultural–ethnic integrity is commonly assumed. For example, the Salishan family has been historically divided into three sub–groups: Interior, Coastal and Bella Coola. Each sub–group can then be linguistically divided into smaller languages; the Interior has the Thompson, Okanagan–Similkameen, Sinkaietk and others. Athapaskan can likewise be divided along lines of linguistic continuity and discontinuity according to semantic, syntactical and lexicostatistical means (Kinkade et al. 1998: 49–51, 67–69).

Since language is the principal criterion that distinguishes ethnic groups, anthropologists and archaeologists have also tended to associate linguistic sub–groups – aligned by geographic and ecological factors – with ethnicity. Shaw (2001: 49–52) indicated dialect differences could be demonstrated for the Okanagan language over the length and breadth of traditional territories in Canada (Okanagan Nation Alliance) and northwestern Washington (Colville Confederated Tribes). She emphasized that "Okanagan" is a continuum of small dialectical changes related to discrete localities and/or geographic sub–regions that probably existed in pre–contact times. She contends this continuum to have been disrupted by colonial and post–colonial influences (that) produced more isolated dialect "archipelagos" (e.g., Colville–Okanogan, *nilxcin,* versus Similkameen–Okanagan, *smelqmix* – see Table 8.1). These terms reflect local identities determined by geographic locations, that is, major riverine watersheds. For example, the term for "ancestor", *nxacin*, is the same in Similkameen–Okanagan and Colville–Okanogan (cf. Mattina 1987: 294). Soapberry, however, is *sxwalhani.t* in Similkameen–Okanagan, not *sx*^{w}*amilp* as in Colville–Okanogan (Mattina 1987: 341). The impact of the fur trade may have fuelled additional linguistic changes, adding to the archipelago effect. Mourning Dove (1990: 121) recorded the archaic Colville–Okanogan term for beaver as *stun'whu* that Mattina (1987: 186) lists as *stunx.* She maintained that this changed in colonial times to *skalweetza* or "money fur", a term not recognized by Mattina (1987), but indicative of the type of extant dialectical variation in existence by the late 19th to mid–20th centuries.

Several historical sources document the existence of an Athapaskan ethno–linguistic group in the Nicola–Similkameen during the latter part of the 19th century (see Chapter 3). What little archaeology has been conducted in the Nicola and Similkameen valleys has focused in part on the identification of Athapaskan speaking populations in the archaeological record (see Wyatt

[1970] for the Nicola Valley; Copp [1995, 1997a] and [Vivian 1992] for the Similkameen) relative to Salishan–speaking populations. This approach may be more relevant for late pre–contact times (ca. 2,000–200 BP), but less so for earlier pre–contact time periods if the hypothesized migration of Athapaskan–speakers was precipitated ca. 1,200 BP by a White River tephra fall (West and Donaldson 2001: 240). Economic stress precipitated by environmental effects caused by the ash fall is thought to have triggered human population dislocations (cf. Workman 1977). The Athapaskan question centres about ways to identify ethno–linguistic populations in the archaeological and ethnographic records.

Lexicostatistics (Glottochronology). Bouchard and Kennedy's (1984; Kennedy and Bouchard 1985, 1998) ethnographic research in the Okanagan–Similkameen area of Canada and the United States supports the past presence of the Nicola–Similkameen Athapaskans through the retention of "Okanaganized" Athapaskan place names. These place names occur in the south Okanagan valley from a point north of Oliver south to Osoyoos near the 49th Parallel. Additional terms also were located as far south as Tonasket in the American Okanogan valley. This indicates a larger area for Athapaskans than Teit's (1930) map of ethnolinguistic boundaries shows "Nicola" (Nicola and Similkameen Athapaskan) extending at least to the latitude of Keremeos in the Similkameen valley. Indeed, it would appear that their distribution was recorded much further south as well as east. Kinkade et al. (1998) reviewed the evidence for an Athapaskan presence in the Similkameen and concluded that it was limited to the last several hundred years. The vocabulary lists preserved indicated a shallow time depth, albeit one affiliated with Chilcotin Athapaskans.

The origins and timings of ethnolinguistically–defined populations have been a concern since the work of Powell (1891) and Sapir (1929, 1949) [both cited in Hunn 2000]. They classified North American ethnolinguistic groups into a number of distinct families, separated by linguistic differences. A distinct migratory wave from northeast Asia is thought to have resulted in the ethnohistoric distribution of Na–Dene languages. These include Athapaskan–Eyak and Tlingit. Haida, once classified as Na–Dene, is no longer considered part of this group. Several outlying groups of Athapaskan speakers range from the Nicola valley (now extinct), along the Pacific Northwest Coast, to as far south as the Navajo of the American Southwest. These groups are considered to have less time depth, that is, less than 1,500 to 2,000 years, due to migrations precipitated by the White River tephra fall dated ca. 1,250 BP. However, earlier or later migrations may have occurred stimulated by economic, social pressures or idiosyncratic behaviour.

Salish and Sahaptin Ethnolinguistics. Ethnographic languages within the general study area are Salish and Sahaptin. Origins and inter–relationships of these ethnolinguistic groups have been summarized by Hunn (2000) and Kinkade et al. (1998). Again, it is recognized that language and material culture do not necessarily correlate, particularly in non–ceramic areas and especially since many ethnohistoric groups were bilingual (Hunn 2000; Kinkade et al. 1998). Linguists and archaeologists have attempted to correlate the two from the perspective of the ethnohistoric and archaeological records. Ethnohistoric and linguistic studies (Hunn 2000; Ray 1936: 111–112; Rigsby 1964: 29, 1996) indicate that a common feature amongst Plateau peoples was a lack of identification to a tribal level. People identified primarily with the village community in which they were currently living or as their natal place. They might also identify themselves in terms of a common language (Hunn 2000). One can see the regeneration of this in recent efforts to teach the Okanagan language in Similkameen Valley public schools. Similkameen elder Hazel Squakin (personal communication 2000) believes so strongly in the connection between language and ethnic identification that she devotes a great deal of her time to language teaching so that "our traditions and way of life will not be forgotten by the young". This is a sentiment echoed by Osoyoos (Nk'mip) Band Chief Clarence Louie, the Canadian Native Economic Developer of the Year 2000 award recipient stated

> Native people should never be in business at the expense of their language and culture. Success must not mean that you forego or forget your heritage. If making money is more important than your Aboriginal heritage, then you have compromised your identity as an Aboriginal corporation (Louie 2000: 4).

Recent syntheses of Salish and Sahaptin origins by Hunn (2000) and Kinkade et al. (1988) summarize the last 100 years of study. They include criticisms of lexicostatistical and glottochronological methodology, but maintain that the techniques are valid and significant to the archaeological record. Hunn (2000), in particular, did so under contract in order to determine the cultural affiliation of the Kennewick human remains, but was careful to state that irrefutable linkages were not possible so that such linkages needed to be expressed in terms of probabilities and liklihoods.

The 20th century "linguistic palaeontology" of Salish and Sahaptin research is best summarized in Hunn (2000), Kinkade et al. (1998), Rigsby (1996), Suttles (1987, 1990), as well as Suttles and Elmendorf (1963). Several general points can be made concerning the antiquity of the Salish and Sahaptin languages:

- Contemporary tribal (American) and First Nation (Canadian) units are a construct of the 19^{th} and 20^{th} centuries and may have little bearing on emic identification prior to this time.

- These constructs have syncretically entered the lexicons, worldviews and political realities of 20th –century indigenous peoples and should not be construed as cultural aberrations;
- Plateau peoples identified with the village level of socio–economic–political integration (the polity) and identification has been etically extended to include larger riverine–montane territories (e.g., *Okanagan – Similkameen*);
- The existence of specific terms for bioresources (flora and fauna) indicates a level of cultural significance to the people and may provide evidence for longevity of occupation and/or past climatic change;
- The existence of specific terms for geographic features (place names) is an indication of familiarity with the area. Continuity of terms determined through glottochronology is an indication of time depth (population continuity) as well as displacement;
- Oral traditions and place names may record catastrophic events that happened in "deep time" (i.e., > 10,000 years BP);
- Bilingualism may reflect long–term contact between different linguistic groups who maintain discrete cultural affiliations from one another;
- Proto–Salishan reconstructions (Kinkade 1991; Suttles 1987; Suttles and Elmendorf 1963) suggest a coastal Salish origin. Glottochronological studies (Elmendorf 1965; Suttles and Elmendorf 1963; Swadesh 1950) indicate Salish expansions up the Fraser River between 4,500–5,500 years BP into xeric forested riverine regions (see Chapter 6 for a discussion of the Lochnore Phase Salish expansion data) from coastal homelands located between Puget Sound and the Strait of Georgia;
- Proto–Penutian (Sahaptin) habitats consisted of xeric grassland–steppe environments characteristic of much of the Columbia and south Fraser Plateaus; and
- Glottochronological studies (Hunn 2000) suggest a Columbia Plateau time depth for Proto–Penutian (Sahaptin) of 8,000 to 9,000 BP.

Hunn (2000) concluded that linguistic evidence clearly supports the presence of Sahaptin or its direct Proto–Sahaptian ancestor in the Columbia Basin by 2,000 to 5,000 BP. He extrapolates from this to state that Proto–Sahaptian was likely to have been spoken there prior to an expansion of Interior Salishan languages ca. 4,000 to 5,000 BP. A Penutian affiliation back to 8,000 BP or greater seems speculative, but he also states that there is no viable alternative to it given the state of the data and methodology employed. Similar studies suggesting a 4,500 to 5,500 BP Salish expansion into the mid Fraser–Thompson area of British Columbia appear to correlate with two distinctive archaeological datasets in the area (Stryd and Rousseau 1996: 198–200). The Lochnore phase is thought to document a Salish expansion and eventual replacement of Proto–Sahaptian Lehman Phase peoples in this area of the Interior Plateau (see Chapter 6).

Divergent views of the power of linguistic models to determine the time depth of ethnolinguistic populations persist. Hunn (2000) appears comfortable assessing age ranges of 5,000 BP and speculates that genetic antecedents may be extrapolated back to 8,000 BP or older. Archaeologists working on the Fraser Plateau (Stryd and Rousseau 1996) also support a 5,000–year time span for an initial incursion of Salish/Proto–Salish into the mid Fraser–Thompson River region, replacing earlier Proto–Sahaptian populations. However, a major methodological concern of these methods rests upon a determination of mutation rates for languages. As with models purporting to determine age estimates through mitochondrial–DNA analysis, linguistic and genetic mutation rates are known to vary, so rates are averaged. The evolutionary model of punctuated equilibria (Gould and Eldridge 1977) has its counterpart in lexicostatistics in the form of the Great English Vowel Shift of the 12^{th} to 14^{th} centuries AD (e.g., Menzer 2000). As such, until linguists can establish rates of change for any language group, temporal estimates different ethnolinguistic divergences, hence population movements may be suspect unless associated with other criteria (e.g. migrations stimulated by volcanic activity), although perhaps broadly accurate within a time scale of several millennia. With error factors reckoned in millennia, the timing of the presence/absence of Athapaskan–speaking populations in the Similkameen valley must be considered in light of other lines of investigation including biogenetics, ecology, linguistics and archaeology.

Plateau Bioarchaeological Data.

Biological studies in dental morphology and genetics originally appeared to support Greenberg's (1987) linguistic hypothesis, indicating three separate population migrations from Siberia to the New World, with an Athapaskan and other Amerind presence after the PalaeoIndians but before the ancestral Inuit. Alternatively, recent research (Bolnick et al. 2004: 519–523), that compared genetic and linguistic models, refutes a simple tripartite system, going so far as to state that Greenberg's "Amerind" did not exist and that the evidence to date supports multiple entries, the majority most likely along the Pacific Coast.

Genetic evidence in the form of Gm haemoglobin allotypes has been used to calculate genetic distance between populations. For example, O'Rourke et al. (1985) provide genetic evidence suggestive of an early (initial) migration from western Beringia followed by at least two later migrations (cf. Greenberg 1996; Greenberg et al. 1986) assumed to represent ancestral Na–Dene and Eskimo–Aleut peoples. The initial proto–Amerind population expanded, either along the coast (Fladmark 1979b, 1982; Gruhn 1988, 1997), or through the interior of British Columbia to form the ancestral populations of the Okanagan–Similkameen otherwise identified as variants of the Cascade Horizon (4,500–7,500 BP) (see Chapter 6).

Mitochondrial–DNA, stable isotopes, and other biological attributes of human population show promise in the search for ways in which the nature and time depth of ethnolinguistic/ethnic communities may be determined. Very little of this type of information is currently available for the Interior Plateau of British Columbia and northern Washington State. Human remains from the Okanagan–Similkameen are rare. Those examined have not been studied beyond the establishment of standard forensic information such as age, sex, stature and pathology. Radiometric dating of human remains, or typological dates based upon associated culture materials, provides limited information. Ethnic affiliation is generally assumed with the First Nations band(s) in whose traditional territory the remains are found. Population information of any type for the Similkameen is currently non–existent, let alone for the probable full 10,000–plus years of human occupation in the area.

Human teeth are often found in archaeological sites and have potential for determination of a pre–contact individual's region of birth. Price (2000) has successfully determined that human dental remains retain an isotopic signature, identifiable via mass spectrometry, traceable to a specific geographic locale. $Strontium^{87/86}$ isotopic ratios may vary according to variation in bedrock type. Strontium enters local soil and ground water and thence into the food chain. Strontium and calcium form dentine in teeth. Dental enamel forms during infancy and early childhood with little post–childhood addition. Strontium in bones is gradually replaced through cellular growth – ergo, a tooth sample may be used to separate natal origins as long as the strontium signature for the region is known. This technique has been used successfully in Europe and Mesoamerica (Price 2000) and could potentially be used in cases where isotopic carbon and DNA studies cannot be conducted due to sample deterioration or cultural practices (i.e., First Nations' research conflicts). The recent (June 2006, see Appendix A) recovery of pre–contact human remains in Lower Similkameen Indian band territory (Copp 2006) has provided bone and dental samples that may be used in the future for this type of analysis. In the meantime, a bone sample submitted for radiocarbon assay yielded an estimate of 640 ± 40 BP. Stable isotope analyses ($d^{13}C$ and $d^{14}N$) provided percentages at –16.4 % and +16.0 % respectively, indicating a ca. 50 ± 10 % marine (i.e., salmon) diet (Dr. B. Chisholm, personal communication 2006). A dental sample will likely provide a baseline for Nicola–Okanagan– Similkameeen mtDNA analyses.

Limited DNA information from adjacent areas is available and provides a comparative database, but is mostly restricted to later periods. Middle to early pre–contact remains are elusive and subject to serious concerns around First Nations' issues and, in the United States, the North American Graves Protection and Repatriation Act (NAGPRA). Two samples of early Plateau peoples are currently available: the Gore Creek (EeQw–48) and Kennewick skeletal remains. Both represent adult males associated with early riverine foraging–fishing societies. The Gore Creek remains were located in the south Thompson River Valley in traditional Secwepemc territory. The site consists of the post–cranial skeleton of a young adult male buried by a mudflow. All skeletal elements were recovered from a stratum below Mazama tephra. Radiometeric dating of a skeletal element resulted in an estimate of 8,250 ± 115 BP. (Cybulski et al. 1981). Artifacts were entirely lacking, but the $d^{13}C$ ratio indicated a diet of 8 ± 10% marine protein. The most likely source of marine protein for this upriver locale is salmon (Chisholm and Nelson 1983: 85–86).

The Kennewick remains were found in north–central Washington State on a bank of the Columbia River near its confluence with the Snake River. A summary statement of research conducted on skeletal remains of an adult male found below Mazama tephra with a Cascade point embedded in his illium (Babbitt 2000) includes the following relevant information:
calibrated radiometric assays on skeletal elements based on a delta carbon–13 value of –14.9%, indicating a postulated marine (salmon) diet of 70% provides a range of 8,340–7,200 cal ^{14}C years BP (Taylor et al. 1998).

Radiometric assays and typological analysis of the leaf–shaped projectile point indicate a cultural affiliation transitional between late Windust (13,000–9,000 cal BP) and early Cascade (9,000–7,600 cal BP) Phases. Subsistence was based on a foraging strategy, involving hunting of large to small game, fishing and plant gathering without benefit of storage facilities. This suggests a highly mobile and wide–ranging set of small localized populations (bands) exploiting varied bioecological zones.

Kennewick's morphometric attributes do not correlate with any living Holocene native or non–native group in North America. However, speculation that such early populations represent a pre–existing (pre–"Indian") gene pool cannot be substantiated by DNA or linguistic studies (cf. Ames 2000 a–d; Ames et al. 2001).

Both sets of early Plateau human remains suggest an early emphasis on salmon, coupled with generalized foraging (hunting and gathering) resource strategies. Archaeological sites of pre–Mazama tephra times indicate small groups of highly mobile people capable of exploiting varied bioecological zones based from short–term occupation logistical or opportunistic camps located on river terraces and, probably, in montane areas.

Analysis of the limited sample of human remains from the Middle to Later pre–contact periods provides further information about past Plateau peoples' demographics, health and other information (cf. Campbell 1990). However, it has not been assessed from the perspective establishing ethnolinguistic or ethnic affiliation, as this requires methods of DNA analysis on living and archaeological samples and populations. Thus, to date, such information is not available.

Ecological Considerations. The earliest known evidence for human occupation in the Similkameen valley has been established at 7,400 BP (8,200 cal BP) (Copp 1996b, 1997a). Indications that populations inhabited the valley system prior to this takes the form of rare surface finds of Cascade and Windust projectile points. Again, one possible Paleoindian Plainview–like lanceolate point with collateral flaking and edge grinding also was observed in 1974 by the author in a private collection (Chapter 5). Current models for initial colonization of the Pacific Northwest, including interior British Columbia and Washington State, assume movement up the Fraser and Columbia Rivers from the coast. Alternatively, a Holocene–only Interior route has been postulated, with populations moving north to south from the Yukon (Eastern Beringia) through the boreal and sub–boreal forests of the Fraser Plateau, including the trans–plateaus montane regions of the Okanagan–Similkameen (Magne and Fedje 2003; Stryd and Rousseau 1996: 198–200,). Both scenarios have merit and a combined model may ultimately be the most elegant model of colonization.

A linguistic–ecological model for early colonization of the trans–plateaus developed by Rogers (1985; Rogers et al. 1990) postulated a distribution of historic Aboriginal ethnolinguistic groups related to late glacial ice–margin and biogeographical zones dating to terminal Wisonsin times. Rogers (1985) explains the discontinuous language family distributions, where some areas express great diversity whereas others exhibit much less, as the result of geographic barriers that no longer exist. These barriers are correlated to the 18,000 BP Wisconsinian maxima when Cordilleran ice impeded colonization. Rogers assumes that the large degree of linguistic diversity in the Pacific Northwest is a function of great time depth, in common with most linguists for data on a global basis. A basic assumption is the greater the time depth of a language in a specific region, the greater the resultant linguistic diversity. This appears to be the case for the Salishan and Athapaskan languages (cf. Carlson 1990, 1996c). Rogers et al. (1990) emphasized a perceived relationship between linguistic diversity and barriers to language and/or population migration/mobility. In terms of late Wisconsin environments the critical variables were the size, extent and longevity of Cordilleran ice that filled plateau valleys. Peri– and para–glacial phenomena would define post–glacial biogeographic areas, especially within south–central British Columbia where the resultant valley systems trend north to south more predominately than east to west. Since the Okanagan–Similkameen river systems form the northernmost extension of the arid and semi–arid Sonoran biogeographical zone, it would not be surprising to link its earliest expressions of human occupation with the Columbia Plateau rather than north to the Fraser Plateau.

Rogers et al. (1990) postulate that early populations would form discrete linguistic groups within such boundaries with more integrity within, than between, groups. There is merit to this premise, especially in terms of geographic variables. The trans–plateaus montane areas of south–central British Columbia include major and minor river drainage and basin systems (i.e., Thompson–Fraser, Nicola, and Okanagan–Similkameen). With the exception of the Nicola–Similkameen Athapaskans, these montane–riverine systems have historically been the domain of the Salishan language family. This family can be split into mulitiple language groups or dialects (Kennedy and Bouchard 1998; see Chapter 1). According to Rogers' et al. (1990) model, this linguistic diversification would have resulted from the combination of geographic limits to mobility as well as time depth.

On the other hand, north–central Washington State exhibits languages of the Penutian (Sahaptin) family group historically located in the drier Columbia Plateau and eastern Cascade foothills. Applying Rogers' et al. (1990) logic, the Columbia Plateau and eastern Cascades would have been colonized initially by proto–Sahaptin speakers (Kennewick population?) who migrated up the Columbia during the terminal Pleistocene or very early Holocene. Similarly, the first south–central Interior British Columbian populations would have moved up the Fraser River and tributaries to colonize the trans–plateaus region (a Gore Creek population?). These populations would have been comprised of proto–Salish speakers. Both populations would have been derived from early coastal colonists, although not necessarily from a single parent stock. Initially, these populations should be represented by similar generalized foraging subsistence and settlement patterns. These patterns do exist and have been defined archaeologically as the Windust and Cascade Phases in the Columbia Plateau (proto–Sahaptin), as well as in Cascade Horizon (proto–Salish) equivalent cultural complexes in Canada (cf. Carlson 1990, 1996c; Stryd and Rousseau 1996).

The converse, replacement of pre–existing Coastal peoples by Interior–adapted groups has been postulated during the Skeena phase (3,600–3,200 BP) at Kitselas Canyon on the Skeena River (Allaire 1978, 1979 cited in Fladmark et. al. 1988: 237). This hypothesis suggests a trend that is the reverse of that hypothesized for more southern Coastal and Plateau areas.
The central Chilcotin Plateau and Southern Cariboo areas appear to exhibit culture history sequences extending back 3,500 years. Pokotylo and Mitchell (1998: 101) summarized this evidence as likely being similar to that of the mid–Fraser sequence discussed above. Although

highly speculative, this could include pre–3,500 BP proto–Sahaptin populations inhabiting the Fraser Plateau. However, lexicostatistical (glottochronological) estimates of ethno–linguistic groups are suspect in methodology and application (see above).

As noted previously, Stryd and Rousseau (1996) postulated adaptive strategies for the Fraser–Thompson River region including; 1) montane–oriented generalized foraging and 2) riverine–based foraging fishing. The latter is seen as associated with a proto–Salish expansion into the area, whereas the former could reflect earlier generalized foragers who failed to capitalize on anadromous salmonid stocks.

Initial occupations of areas south of Cordilleran ice by proto–Sahaptin groups may be hypothesized. These peoples exhibit evidence of an early use of anadromous salmon at the Dalles and at Kettle Falls, both on the Columbia River, between ca. 9,000–10,000 BP (Chance and Chance 1982; Daugherty 1956a, b; 1962). Elsewhere, other proto–Sahaptin populations may have retained a generalized freshwater fishing–foraging pattern, especially in areas historically lacking anadromous salmon, such as the Similkameen River valley. It could be hypothesized then, that initial colonizing populations in the Similkameen Valley were generalized foragers of proto–Sahaptin linguistic stock migrating into an area for which they were pre–adapted in terms of subsistence strategies, even though, again, it lacks salmon except in the region south of the International Boundary.

A faint echo of such a migration such as this might be preserved in ethnohistoric Similkameen oral traditions. Bouchard and Kennedy (1984), Hudson (1994), as well as Robinson and Wickwire (1989, 1992) recorded a Similkameen myth indicating that some ancestral Ashnola people were descended from a party of starving hunters traveling north from the Methow River valley. The Athapaskan presence in the valley is recorded in another story in which a party of Chilcotin–Athapaskans migrated to the Nicola–Similkameen where they eventually assimilated into the indigenous Salish–speaking population. In addition, Teit's (1930: 198–294) ethnography of the Okanogan–Similkameen records the existence of Similkameen–Athapaskan (Stewi'x) populations throughout the valley until the advent of the horse in the 18th century. Increased overland trade by Okanagan–speakers apparently displaced Stewi'x from the southern valley in concordance with increased Thompson intermarriage in the upper valley. Finally, by the late 19th to early 20th centuries the final remnants of the Stewi'x population had been absorbed or replaced by Okanagan–Salish. More detailed, and theory–based, examinations of oral traditions are required to integrate archaeological data and oral traditions (cf. Echo–Hawk 2000).

Plateau Archaeological Data.

In terms of the Fraser–Columbia area, Rogers et al. (1990) and Gruhn (1997) postulate early colonizing populations derived from coastal Alaska, dating to terminal Pleistocene times. Archaeological referents are the Paleoarctic Denali and related cultures (ca. 11,000–9,000 BP) (West 1996b) in turn derived from western Beringian Dyuktai and related complexes (ca. 18,000–12,000 BP) (Orloval and Kuzmin 1999). The lack of evidence for an Ice–Free Corridor and related livable areas through north–central British Columbia prior to about 11,000 years BP (Bonnichsen and Turnmire 1999; Fladmark 1979b; Gruhn 1988) lends increasing credence to initial colonizing movements along the coasts of Alaska, British Columbia, Washington and Oregon.

Pre–11,000 BP archaeological cultures identified south of Pleistocene ice margins (i.e., south of British Columbia) in the Interior Plateaus of the Pacific Northwest include:

Palaeoindian (PalaeoAmerican). Sporadic evidence of Palaeoindian occupations includes that of the Clovis Tradition (11,000 to 11,500 BP). The site exhibiting the best evidence of classic Palaeoindians in the Plateau is the Richey–Roberts cache (Gramly 1996; Mehringer and Foit 1990;) found near Wenatchee, Washington. Apart from the cache of Clovis projectile points, postulated as evidence of shamanic activity, little local information about settlement patterns or economic activities of these people is known. Recently, a potential Clovis projectile point was observed by the author in the Boundary Museum in Grand Forks, British Columbia (Figure 7.1).

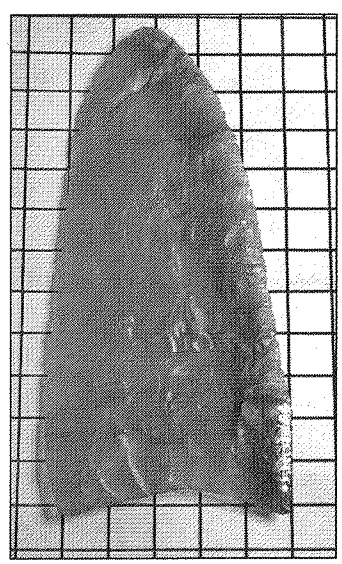

Figure 7.1: Probable Clovis point, Grand Forks area (British Columbia)
Scale: 1 cm squares

Although unfluted, the cryptocrystalline silicate point on display exhibits classic overshot collateral flaking with multiple basal thinning flakes resembling one of the Richey–Roberts cache. It is hypothesized that this point may represent a late (10,000 BP or less) manifestation of Clovis culture in south–central British Columbia.

Intermontane Stemmed Point Tradition. Sites characteristic of the Intermontane Stemmed Point Tradition (Carlson 1996a, c) include early Windust Phase (Ames 2000a–d; Rice 1972) and its descendent Cascade Phase (Bense 1972; Conolly 1999; Lohse 1985, 1995). The Windust Phase was originally defined by Leonhardy and Rice (1970) and later refined by Rice (1972) based on evidence from three sites on the Lower Snake River; Windust Cave, Marmes Rochshelter, and Granite Point. Cultural reconstructions indicate Windust Phase peoples operated foraging subsistence strategies characterized by small groups of highly mobile populations exploiting a wide variety of ecological zones.

Cascade Horizon. The Cascade Horizon in the Columbia Plateau is generally divided into two sub–phases. The early Cascade sub–phase (8,000/7,500–6,800 BP) is characterized by three subtypes of diagnostic leaf–shaped Cascade projectile points that might be construed as material culture indices: the Cascade A, B and C types (Lohse 1985, 1995). Large side–notched projectile points serve as horizon markers (Leonhardy and Rice 1970: 6) for the later, post–Mazama tephra fall subphase. The early sub–phase dates ca. 8,000–6,800 years BP, although Cascade points were also located at the base of Windust Cave overlying Glacier Peak tephra (ca. 11,200 BP). Regardless of the antiquity of leaf–shaped projectile points, there appears to be a formal evolutionary relationship between Windust and Cascade Phase projectile points and, by association, cultures (Traditions). The later Cascade Phase dates ca. 6,800–4,500 BP, although leaf–shaped projectile points of diminished size continue in southern Fraser Plateau sequences until ca. 2,000 years BP or later (see Chapter 7). As with earlier Windust Phase peoples, those of the Cascade Horizon were characterized by small, highly mobile populations exploiting diverse riverine and montane ecozones.

This evidence suggests that the earliest Similkameen populations were likely part of the Intermontane Stemmed Point Tradition (Windust Phase) and descendant Cascade Phase cultural traditions. Thus, it can be postulated that initial colonizing populations spoke proto–Sahaptin languages. By the Middle pre–contact period, archaeological evidence points to a replacement and/or amalgamation of these peoples by Salish–speakers, just as later Athapaskan–speakers were linguistically and culturally assimilated by the Okanagan–Similkameen.

Ethnoarchaeology.

Ethnoarchaeology provides the closest equivalent to hunter–gatherer ethnic identity. In developed countries such as Canada, however, it can be difficult to conduct ethno–archaeological studies of early 21st –century hunter–gatherers, since that lifestyle has largely disappeared, or been greatly modified. Even Binford's classic (1978, 1980) ethnoarchaeological studies of the Nunamiut required the caveat that the behaviour patterns under study had been modified through adoption of post–contact behaviour patterns and technology.

The adoption, through syncretism, of new material culture or behavioural elements is assumed to filter pre–existing patterns. It could be argued that all ethnoarchaeological research conducted in the 20th century suffers from the realization that syncretic adoptions form the basis of all societies and technologies, for good or ill. Thus, it could be argued that fur trapping was a basic cultural pattern upon which historically was grafted to the more efficient technologies of metal traps, as well as the market economic system of Eurocanadians. Ethnoarchaeological studies usually provide a written caveat that such adaptations should still reflect underlying ancient behaviour patterns.

There are two common levels of analogy useful for the consideration of pre–contact ethnicity:

1) The Direct Historic Approach in which patterns of the ethnographic present are also perceived in the proto–historic and pre–contact archaeological records as has been the case in previous Okanagan–Similkameen studies (cf. Grabert 1968, 1970, 1974), and

2) The Synthetic Cultural Approach in which patterns observed in the ethnographic present of a culture are used as analogs for archaeologically–derived cultures with similar (but not identical) environmental, cultural–behaviourial, technological and subsistence attributes. This approach provides general levels of hunter–gatherer analogy (cf. Bettinger 1991: 31–60; 213–224) and thus is more useful for the development of general theories of foraging culture behaviours, past and present.

It is at the synthetic level of analogy that certain aspects of ethnicity need to be addressed. Anthropologists and archaeologists often assume that a specific geographic area correlates to an ethnic (band or tribal) territory, held *in usufruct* by a specific group to the exclusion of all other such groups as indicated for the Similkameen (Chapter 3). Ethnographic data for extant foragers suggest that the idea of discrete territories controlled, or managed, by the community is a cultural ideal. In practice, many foragers allow other group access to "their" territories through the simple expedient of granting permission. From an etic perspective, the granting of permission is a form of reciprocity on at least two levels. The first level equates to the expectation that either group could acquire access to the other's communally held territories for resource acquisition, should subsistence fall below maintenance levels. This behaviourial strategy ensures survival during times of economic deprivation. The second establishes generalized reciprocal obligations among communities that ultimately allow for the establishment of reciprocal exogamous ties. Since most foraging groups for which ethnological data exist have tended to be dispersed, with low population densities per unit of land, reciprocal exogamy ensures the continuation of a viable genetically diverse population and reciprocal economic aid during times of stress.

Thus, the idea of specific group territoriality analogous to the self–specified ethnic group may be an idea that is more imagined than real for basic ("ideal") foraging societies. Territoriality is a weak concept for foragers, but transegalitarian and stratified societies rely more heavily on the concept because it regulates access to, and use of, resources that come increasingly under control of certain segments of the society and, hence, increases the need for ethnic identification. In short, foragers who have existed in low density, dispersed populations with high mobility and reciprocal exogamy with neighbouring groups, appear to have recognized the ideal of communally controlled territory. However, individual and group mobility was flexible, as self–defined groups could cross or access resources according to closeness of perceived social ties. This tends to obscure the practicality of defining such groups as "ethnic" except at the most general level.

A general level of meaning equates people (communities) who share a common language, subsistence strategy, kinship network and worldview with an ethnic unit. For foragers, this is, in fact, how academics perceive ethnological ethnicity. Kindred groups are referred by name in general, but specific sub–groups are referred to in terms of their location (territory) or aggregate community identity, such as village name as in "a resident at Nk'mip" becomes "an *Nk'mip"*. For example, the works of Yellen (1977) and Lee (1984) refer to groups that, for classificatory purposes, are defined by their relationship to a specific region and attendant sources of water. Lee's studies however, indicate the ephemeral nature of forager social groups, because of the incidence of families transferring in and out of the area due to the rules of exogamy. Thus, the larger geographic area includes many communities and defines that ethnic group, or mass culture, even though the people themselves may reject their inclusion in such a broad group. As such, a particular group may appear to fulfil the requirements of an etically–defined ethnic group, but from their emic perspective such a classification would be rejected. The problem then lies in the dichotomy between emic and etic definitions of socio–cultural reality.

Which is the best perspective or could both be of equal importance? This is a justifiable concern, especially since many "territories" globally are inhabited and differentially utilized by more than one culture or ethnic group. However, it would appear that objective, empirically–defined ethno–linguistic identities derived from a single language appear to be the norm in most cases.

Similkameen–Athapaskan (Stewix) Ethnicity

Co–habitation or sharing of resource areas in prehistory and identification of ethnicity in the archaeological record has been attempted by many Plateau scholars, especially in attempts to define an Athapaskan presence. Again, Stryd and Rousseau's (1996) synthesis of Middle Period mid Fraser–Thompson cultures beginning ca. 5,500 BP postulates that a riverine and forest adaptation derived from earlier ungulate hunting Nesikep Tradition peoples, allowed an expansion of Salish–speaking Lochnore Phase peoples into the southern interior to exploit riverine (salmon), grassland (roots) and forest (ungulate) resources. A Salish identification of those peoples is specifically stated as being based upon "the continuity between this tradition and the historic Salish–speakers of the area. Furthermore, Elmendorf (1965) identified the northwestern part of the present Interior Salish territory as "the most probable homeland of the proto–Interior Salish, an area more or less consistent with that of the Lochnore Phase" (cited in Stryd and Rousseau 1996: 199). The co–resident Lehman Phase population inhabiting upland areas and presumed not to be capitalizing on riverine salmonid resources in a more Athapaskan–style orientation is interpreted to be a distinctive, and separate cultural or ethnic group.

Wilson (1991), working in the same area, rejected the bi–ethnic model, citing mixed Lochnore–Lehman assemblages in most sites as well as the co–occurrence of these materials at the Baker site (EdQx–43) and at nearby sites EdQx–41 and EdQx–42. Wilson et al. (1992) felt that comparisons between Lochnore and Lehman Phase sites should more properly be made with Indian Dan/late Kartar Phase populations of the Okanogan and Upper Columbia River regions of Washington State, based upon shared patterns observed in projectile points and house form. Wilson prefers to view differences in site assemblages as "different specialized activities" rather than attribute them to cultural differences between groups. Stryd and Rousseau (1996: 199) counter that, in their opinion, assemblage differences do reflect cultural, i.e., ethnic, differences, and components of Lochnore and Lehman Phase sites are not mixed, although they recognize that problems could exist from deflation or investigator error in assemblage recognition.

Without access to the sites for re–excavation and examination of original field documentation it is difficult to objectively determine which view is more likely to be correct. Could the co–existence of two similar cultures, in this case both foragers or forager–collectors, over long periods of time be possible, given possible stressors such as competition for resources? Salishan river–oriented mixed forager–fishers would still have needed access to upland root, berry and hunting areas supposedly occupied by Athapaskan foragers. It is unknown whether such a situation could remain in stasis for millennia.

Material Culture Studies and Ethnicity. For archaeologists, defining ethnic identification is generally attempted through material culture studies since these are the baseline for data in the discipline. Underlying such studies is the assumption that differences in material culture form or style reflect communal ideals of self–identification. Some success has been achieved in material culture studies, ranging from the purported identification of individuals in the archaeological record, to groups of individuals within a community, to community identities or social group identity (Carlson 1979, 1983b, 1990, 1996c; David et al. 1988; Hodder 1982a, b; Longacre 1970a, b; 1991; Magne, personal communication 2004; Magne and Matson 1987). Unfortunately, most published studies deal with material culture that is not generally present in the archaeological record of Similkameen hunter–gatherers, i.e., ceramics, decorated calabashes, shields, and other aspects of material culture. Their utility in this context relates to the development of general theories of material culture in relation to identifiable social groups within or between societies, almost none of which are foragers. On the other end of the scale are researchers such as Ucko (1989: x–xi) who argued that archaeological classifications of material culture do more to obscure patterns that reflect social differentiation than reveal them. Ucko maintained that, since typologies are often subjective in nature, then any correlation of material culture and social grouping is more of an emic perspective resulting from cultural biases of the investigator.

Experience acquired while participating in archaeological projects in West Africa confirms the real identification of personal and group identities in terms of material culture. For example, the village of Daboya in Ghana is well known in the area for the production of the distinctively patterned woven cloth. In the late 1970s, one could still identify a wearer's village of origin by such patterns. However, this was changing as commercially mass–produced cloth products were rapidly replacing the more labour–intensive hand–woven varieties. As well, changing perspectives among a majority of village, town and city dwellers indicated that mass–

produced objects were perceived to be better than hand–made products because they were symbolic of progress and were perceived as advantages for newly–industrialized nations.

Analyses of complex material culture systems involving urban communal architecture, weaving, pottery, artifact decorations, and other criteria have formed the basis for deducing individual or group identities in the ethnographic present and have also served as Middle Range referents to the archaeological record. This appears to be a generally accepted level of analysis and analogy in archaeology, however, such studies tend to be based upon more complex, stratified cultures – not those of people with a predominately foraging subsistence strategy.

Material culture that has been used to deduce or infer ethnicity or group identity in the archaeological record of past foragers, has tended to focus on relating distinctive artifact types (style), or broader technological traditions with specific groups. For example, Teit (1930: 217–223) suggested that an absence of ground stone artifacts, specifically mortars and pestles, arrow smoothers and coiled baskets may have been indicators of the Athapaskan nature of Stewi'x populations in the valley. Counter to this, Teit's (1930: 219, 225–226) records indicate more common use of Columbia Plateau cultural traits involving the use of woven tule and sage textiles. As such, it is difficult to equate these material culture traits to retention of Athapaskan patterns (re: absence of ground stone) or syncretic adaptation of the more xeric resources of the valley.

Rousseau's (1992) analysis of key–shaped formed unifaces, relatively commonly found in Columbia and Fraser Plateau sites dating between 4,000/3,000 to 1,000 BP, may be an indication of the relative uniqueness of the Similkameen archaeological record by their absence in the valley archaeological record. Rousseau's experimental study of replicated artifacts and microwear analysis suggests they were used primarily in processing stalks and branches, possibly as shaft smoothers and for other woodworking, as well as occasional shaving and smoothing of antler (Rousseau 1992: ii). As these distinctive artifacts occur in territories commonly associated with Interior Salish and Sahaptin–speaking Plateau peoples (Rousseau 1992: 98), their absence in the Similkameen Valley may be indicative of Stewi'x populations at a time depth of ca. 1,000 to 3,000 or 4,000 years, assuming that the current archaeological database has not missed these tools due to sample bias. Rare examples of this artefact type have been found in central British Columbian sites at Punchaw and Tezli Lakes, the result of pre–Athapaskan Salish occupations (Rousseau 1992: 24), as well as in the Arctic, but Rousseau (1992: 26) suggests "use restricted predominately to groups participating in, or being partly influenced by, a typical "Plateau" adaptive pattern."

Magne and Matson (1987: 57–80) discriminated between Athapaskan and Salish projectile points through application of multiple discriminant and multidimensional scaling analyses. Their sample consisted of 57 small side–notched projectile points from sites in north– to south–central British Columbia. Tables of quantitative and qualitative data derived from this sample were used to statistically validate their hypothesis that differences were equated with historical ethno–linguistic territories of Salish or Athapaskan speaking peoples. They indicated that populations of small side–notched projectile points could be readily identified according to presumed ethnically relevant morphological traits in a gradient ranging from north to south in the Plateau.

One of the most discriminating variables was the small concave–based side–notched projectile point with spurs projecting from one, or both, basal edges (Dr. M. Magne, personal communication 2000; Magne and Fedje 2003). Whether such discrete artifact traits are always a reflection of ethnicity between the two cultures (e.g., Salish and Athapaskan) or some other cultural or idiosyncratic pattern is debatable, especially since similar points are found in sites dating less than 1,000 BP on the northern Plains – well outside the ethnolinguistic boundaries of pre–contact south–central British Columbian Salish and Athapaskan speakers (Kehoe 2002: 132–134). However, they combined specific artifact attributes with a statement that house form, size and depth could also be diagnostic of ethnicity (Magne and Matson 1987: 67), expanding analysis beyond the level of just discrete artifact and house styles to (inferred) general socio–economic or political patterns. They were careful however, to state that these findings were *suggestive* of ethnic identification and not conclusive evidence.

In terms of the Similkameen artifact database, a single small side–notched projectile point with a projecting basal spur recovered from deposits dated 710 ± 40 BP at the Snazaist Village site and three more from the Cool Creek (DhQx–10) could be inferred as "Athapaskan". On the other hand, it also is likely that this point sub–type could be explained by stimulus diffusion – or simply a reflection of the range of variation of small side–notched point variants. The site does not exhibit other Athapaskan traits as the pithouse structures, or at least the single example tested, more closely resemble the shallow, saucer shaped types characteristic of the Columbia Plateau and Okanagan Valley. However, small side–notched projectile points appear ca. 1,200 BP in the south–central Interior of British Columbia – the time of the White River tephra fall. Additional significant changes in material culture and behaviour occur on a continent–wide basis, but these trends are beyond the scope of this discussion. As such, this particular trait (small side–notched arrow points) has been interpreted as an Athapaskan presence (cf. Magne and Fedje 2003). On the other hand, particularly since there is a continuum of side–notched projectile points of different sizes throughout the pre–contact sequence from as early as 7,000 BP (Chapter 5), this could represent *in situ* non–Athapasakan reduction of projectile point size associated with shifts from dart to arrow technologies.

Similarly, small, stemmed projectile points are sometimes associated with Athapaskan sites in British Columbia and coastal Oregon (Magne 2001; Magne and Matson 1987: 227). Referred to as Kavik or Klo–kut styles in the Yukon, these relatively rare points in the Northern Plateau (K. Fladmark, personal communication 2005) resemble smaller stemmed variants in the Similkameen (e.g., Rabbit Island series and some Wallula Stemmed variants). Small stemmed points associated with the Coquille Microblade Tradition are found in ethnohistoric Athapaskan territories in Oregon (Connolly 1986, 1991) but, as with side–notched points, stemmed variants also occur early in the Similkameen, becoming smaller over time.

The archaeological literature of British Columbia has suggested that microblade technology can be roughly equated with linguistically differentiated pre–contact, proto–Athapaskan–speaking microblade users (Carlson 1979, 1983b, 1990, 1996a, b, c). What is important is the *prima facie* assumption that microblade technologies arrived across the Bering Strait sometime less than 13,000 years ago and then spread south either as the result of migration and/or stimulus diffusion. Borden (1968), Carlson (1979, 1983b, 1990, 1996a, b, c) and Dumond (1969) viewed microblade technologies as evidence of the spread of early Holocene populations of proto–Athapaskans into North America. By 7,500–8,000 BP microblade technologies were widespread throughout the Pacific Northwest, where they continue to at least 600 BP, and possibly to 200 BP (Chapter 6). Sanger's (1970a) original work defining the Plateau Microblade tradition suggested the technology was extant from 7,500–3,500 BP but also may have continued to proto–historic and/or early historic (Christian Era) times.

Neither migration or stimulus diffusion hypotheses have been satisfactorily falsified, nor have they been verified at the time of this writing. Both explanations remain plausible, so specific traits in the Similkameen area (small side–notched and small stemmed projectile points, a microblade technology and a hunting–gathering–fishing economy adapted to riverine and montane settings) may yet indicate an Athapaskan presence, especially in components dating less than 1,200 BP. Certainly, this does appear to be the case for the Coquille and Rogue River valley sites in Oregon – given an ethnohistoric Athapaskan–speaking population there.

These examples follow ethnic identification based upon material culture studies of Similkameen hunter–gatherers. Since most published studies (cf. Hodder 1982a) have focused on non–foraging societies, except for the Australian and south African areas, there is a need for specific studies oriented towards the identification of attributes from which ethnicity can be deduced. This needs to be accomplished both from the specific level – ethnographic, ethnologic and ethnoarchaeological – as well as from general levels. At the general level it is suggested that conducting excavations of more contemporary archaeological sites from plural or multi–cultural societies for which historic material cultures can be documented could provide a basis for understanding pre–contact ethnic identity. The problem of syncretism, which is especially difficult to determine from the archaeological record, should be approached from construction and analysis of a database that can be studied for causal relationships. These relationships could then be developed into explanatory hypotheses testable against the archaeological record. A processualist approach to the problem is not only necessary, but mandatory, since it would assure levels of scientific rigour and independent testing for comparability of results. These are the most important criteria for assessing any archaeological research and conclusions. However, First Nations' cultural sensitivities indicate that emic perspectives are also important, especially since contemporary disciplinary ethics recognize that this perspective is not only culturally–sensitive, but provides a counter–point to more processualist views of the past.

Art and Semiotics. The use of artistic symbols to deduce ethnicity is one instantly recognized by modern literate peoples. Symbols can be used to identify individuals, sodalities, corporate groups, religions and/or nation states. An underlying assumption about the nature of symbols and signage is that they represent a way and means of separating individuals or groups from other individuals and groups. As ethnic groups commonly adopt "totemic" symbols representative of their communality or as symbols of a polity, it is assumed that this is a basic human pattern applicable to hunter–gatherer societies. However, the lack of pottery and decorated objects other than rock art in the Similkameen precludes the types of studies into art and semiotics advanced by Hodder (1982b).

Mobilary art forms a small portion of the Plateau archaeological record. Unfortunately, a large percentage of these symbols exist in the form of abstract curvilinear or geometric symbols. If they once incorporated semiotic codes the meanings have been lost. Formed sculpture, statuettes and other examples of pre–contact signage provide a more understandable database. For example, Carlson (1983a) sees a continuation of basic artistic designs in mobilary art of the Pacific Northwest Coast cultures with roots back as far as 3,500 to 4,000 BP. It would not be unusual to equate these artistic traditions with specific ethnic groups in terms of historically–

defined geographic–linguistic culture areas commonly demarcating assumed areas of socio–cultural (ethnic) integrity. Sadly, such data is lacking in the research area.

Similarly, rock (or parietal) art studies may be considered as one means of identifying ethnicity from the archaeological record. Although more abundant as a database, parietal art remains less securely dated since it is rarely found in datable stratigraphic contexts. The advent of Accelerator Mass Spectrometry (AMS) dating methods (cf. Loy et al. 1990) shows considerable promise in alleviating the lack of temporal control even though there are still problems to be worked out with this method (Dr. E. Nelson, personal communication 1992). Without adequate temporal controls, rock art researchers who are not lucky enough to find buried motifs in association with datable cultural materials have relied instead upon the definition of regional traditions by stylistic analyses. These studies inherently assume that differences in form of specified design elements reflect aspects of human behaviour. Presumably, regional styles reflect a commonality of group social identity (*sensu* "ethnicity"). Sometimes this assumption is assumed by the researcher (cf. Keyser 1992; Nesbitt 1968), but not specifically stated. The assumption that similarity in form and/or production of a symbol infers a congruence of social identity has yet to be tested in the Similkameen valley.

A perceived problem with determining the significance of rock art from a functionalist perspective is whether a wide range of individuals within any given group painted these symbols, or whether sites were produced by a smaller, particular social subset. Ethnographic information, notably the work of Teit (1900, 1930) indicates that Interior Plateau social groups were mainly egalitarian in nature. However, many rock art sites are assumed to represent Spirit or Vision Quest activities that could have been practised by either sex after puberty, although it is apparent that not all who quested recorded this activity as rock art. As such, researchers tend to equate many parietal art sites with shamanic activities where records were made of dream events in alternate realities (cf. Lewis–Williams 2002). Indeed, Lewis–Williams (2002: 204–227) provides information from European, African, Australian and North American parietal art sites suggesting that some images were placed in order to facilitate shamanic dreaming. The relative lack of artifacts and features within the first two meters of cultural deposits at the Tcutcuwi'xa rock shelter (DhRa–02) versus the high densities of such materials at the Judd Peaks and Layser Cave shelters in the southern Cascades (Daugherty et al. 1987a, b) and the relatively heavily painted shelter walls suggests that this site was not a field camp, but a site where shamanistic activities took precedence.

This probably explains the general reluctance on the part of the Upper Similkameen elders to allow archaeological investigations until recently, when plans to place a four–lane highway within sight of the shelter convinced them that some examination should take place. Although opening and closing ceremonies with ritual cleansing were held at this site, it was noted that elders were conspicuous by their absence. Excavations at other sites generally attracted a small number of elders, but usually they preferred not to witness the exhumation of their past. Their absence at this particular site may be indicative of the power of the site and the fact that it was upsetting to have invasive work done. That parietal art sites may serve as foci for shamanistic dreams and as portals to alternate realities that leave residual power is something that future researchers should consider when approaching First Nations to do work on sites of this type.

The concept of residual power in spiritual sites is a serious issue among Similkameen First Nations. For example, the term Ashnola (*Acnol'ux*) refers to residual spiritual energy left after participating in a sweat lodge ceremony (R.K. Dennis, personal communication 2002). The confluence of the Ashnola River is currently the main on–Reserve residential area for Lower Similkameen band residences and also contains the circular burnt rock remnants of past sweat lodges. Archaeological investigations in such areas should only be conducted after consultation with the appropriate elders with whom spiritual issues are mitigated.

Studies of modern material culture and graffiti abound, with examples of symbols that have been co–opted or suborned by culture or sub–culture units. The value of rock art studies, as for mobilary art, lies in the potential they have for determining stylistic boundaries which may equate to ethno–linguistic boundaries or, eventually, archaeologically–defined ethnic boundaries *once criteria have been established for the recognition of pre–contact ethnicity.* In terms of the Similkameen Valley, the east side of the river between Hedley and Princeton exhibits clustered sets of pictograph sites – some with rare, with four sites exhibiting large anthropomorphic figures over 80 cm high. These icons are not encountered in other Columbia or Fraser Plateau sites with any greater frequency. This clustering might be interpreted as boundary markers, perhaps distinguishing between areas in which shared access was granted, as opposed to areas of restricted access due to an attempt to control access to a scarce resource (e.g. the red ochre sources in the Tulameen Valley) or for idiosyncratic cultural reasons. Currently, the analysis of rock art symbols and function(s) analysed from a landscape archaeology perspective awaits the development of methodology and theory oriented towards testing functionality. As with the case of material culture studies, a systematic theory is required to test assumptions about the nature and utility of the artistic/semiotic records left by pre–literate societies.

Chapter Summary

Archaeologists are quick to assume that the ancestors of historic native peoples must have lived in that same region, albeit usually for an unspecified period or they may circumvent the issue by discussing the archaeology of a region, leaving the question of pre–contact ethnic and cultural identities unspecified. Aboriginal peoples, on the other hand, often think of their ties to the land as stretching back into time immemorial, regardless of the scientific evidence indicating the impossibility of occupation during the last ice age. In terms of the Similkameen–Athapaskans, no conclusive statements, either pro or con, can be advanced at this time other than to state that their local presence was *likely* during late pre–contact times.

Should the presence of Athapaskan–speaking populations be confirmed archaeologically, there will still be the problem of determining the origins of their presence in the valley;

1) As a result of a trickle migration of indigenous Similkameen inter–marrying with individuals or small group forays of Athapaskans, probably male hunters;

2) A result of small group migrations due to localized stress elsewhere, as recorded ethnographically regarding Methow in–migrants (Chapter 3); or

3) Larger group migrations precipitated by wide area stress such as the White River tephra fall.

Regardless of the antiquity of Similkameen–Athapaskans, the fact that this language was extinct by the late 19th century indicates acculturation into a surrounding Salishan–speaking culture through replacement (or subtractive) bilingualism. This is the process by which a mother tongue is gradually lost, over generations, until the original language is no longer spoken. This appears to have been the case with the Nicola–Similkameen Athapaskan language, although when this population first arrived in the valley has yet to be determined.

– CHAPTER EIGHT –

SUMMARY AND CONCLUSIONS

The preceeding chapters summarized results of investigations conducted for this thesis. Primary research goals were tripartite and included:

1) the construction of an 8,000–10,000 year–long Similkameen cultural chronology,
2) an examination of the validity of the Thompson–Columbia Plateau Microblade tradition, and
3) assessing ability to determine the presence, or absence, of a Similkameen–Athapaskan population based on the archaeological record of mobile hunter–gatherers.

Similkameen Culture History

As stated in Chapter 1, it is difficult to begin investigations of diachronic cultural change and/or evolution without having a temporal framework in place. This goal has been accomplished after over a decade working in the academic and consulting archaeological fields and would probably have been accomplished much more quickly had the research been purely academic, without having to rely heavily on funding from industrial sources. Although focussed more on the central and northern portions of the Similkameen Valley, an 8,000–10,000 year chronological framework (Chapter 5) has established the presence of late PalaeoIndian–early Holocene populations who appeared to have been exploiting higher elevations. The recovery of an early lanceolate and Windust points, both in situ and as surface finds, at distances removed from valley bottomlands and especially above treeline is an indication that palaeoenvironmental situations were stable enough to support sporadic human forays from the south not long after deglaciation. As such, future emphasis should be placed on conducting research at, or near, tree line, especially in the highlands of the Okanagan and Cascade Ranges of the valley. The discovery of a late Clovis point and other materials in the Boundary Museum at Grand Forks to the east suggests similar materials could also be present within the Similkameen Valley.

Although populations were evident within the valley throughout the Holocene, including the thermal maximum (Altithermal), Similkameen populations did not follow the trend towards semi–sedentary village patterns as expeditiously as did those in the Okanagan Valley or futher south along the Columbia River. It is likely Similkameen populations retained earlier hunter–gatherer densities as a result of relatively reduced carrying capacities – specifically due to a lack of storable salmonid resources. Beginning as early as 6,000 BP, some Columbia and Snake River

Plateau populations began settling in isolated to small clusters of pithouses, eventually establishing the ethnographic village pattern predicated upon stores of sun and wind–dried fish (see Chapter 3). That no large village clusters have been located in the Similkameen, rather only small clusters of less than five pithouses which may not have been occupied simultaneously, strongly suggests that larger aggregate populations and attendant cultural complexity associated with such aggregates was not a major factor. Rather, any large villages would have been located south of the International Border are in proximity to salmon fishing stations from Squantlen Falls to the confluence of the Similkameen and Okanogan Rivers.

It is most likely that the focus of the ethnographic village pattern, and its antecendents, would have been in the American portions of the valley (including the Palmer Lake area). Utilization of the Canadian Valley would have been of a more seasonal nature, focussed on procurement of resources other than salmon. As such, the scarcity of salmon as a stable, predictable resource relegated most of the Similkameen Valley to the status of a peripheral territory – important with regard to many resources, including the important red ochre from the Tulameen, but never the core for the culture. In this sense, Vivian's (1992) model of the valley as an area that was utilized, at least ethnohistorically, only by groups from neighbouring watersheds, such as the Nicola, Okanagan, Methow and even Coastal areas appears to have been validated.

The following research concerns remain unanswered and could serve as foci for future work in the valley.

- Were all housepits at DiRa–20 occupied contemporaneously about 2000 BP? The single excavated depression should be more intensively examined as its assemblage exhibited a lack of formed tools other than projectile points – which is an anomalous pattern for this type of structure. The presence in this site of cultural materials dating from as early as 4,000 BP to the historic period indicates its value for investigations oriented towards the later portions of the culture history sequence.
- The rare large housepit depressions in the valley (one on the Ashnola River, others located mid–valley) may provide information concerning semi–sedentism trends earlier than those at DiRa–20, if Chatters' (1989, 1995) and Grabert's (1970, 1971, 1984) sequence of house form evolution in the Okanagan (earlier houses were larger and deeper, later were smaller and shallower) holds for the Similkameen as well.
- Why was DhRa–02 (Tcutcuwi'xa Rockshelter), utilized for only 4,000 years and even then, just sporadically? Rockshelters in less favourable locales in the Cascades, such as Judd and Layser Peaks (Daugherty et al. 1987a, b; see Chapter 6) showed evidence of

much more intensive use for longer periods of time. Does the fact that DhRa–02 exhibits a large number of pictographs indicate that the site was considered to be of ritual significance instead? Did test excavations miss more significant, older deposits in the shelter? Could radiometric dating of the pictographs or calcite sheeting covering the ochre images help resolve this question?

- Are there methods of determining sources for Similkameen lithic materials that would help derive the ranges and ages over which specific lithics were procured, utlilized and/or traded? Visual determinations of source locales, especially concerning cryptocrystalline silicates, have been discussed (cf. Mierendorf 1993; Vivian 1992) and dacites sourced (Greenough et al. 2004), but these studies are in their infancy.
- A universal question on the Plateau, and elsewhere, is where are the human remains from 8,000 to 10,000 years of valley occupation? Although numbers of burials were uncovered prior to the mid–20th Century, only one has been uncovered in the last four decades. Is this a problem of lack of reporting, since developers are aware that the discovery of human remains can be a major obstacle against construction completion dates and costs? What methods could local and provincial governments and organizations use to encourage reporting so that information would not be lost and cultural sensitivities (i.e., reburial issues) addressed?
- What of the pictograph record in the valley? These sites are by no means well understood. With the advent of GIS and GPS methodologies, it would seem appropriate to begin a comprehensive record of sites, including stereophotography of images as well as compilation of cultural landscape data. Integrating the cultural landscape with rock art sites may produce new ways of envisioning the Similkameen Valley. For example, an elder once related a story about a horned–owl pictograph site by referring it to a natural feature in the adjacent mountainside. It seems Coyote wanted to learn to fly, but Owl was reticent to teach him. Coyote insisted, so Owl took him up the mountain (visible from the pictograph) and watched as Coyote, predictably, crashed down the mountainside leaving a trail of his entrails to be seen to this day. As such, the archaeological site (pictograph) is actually part of a larger cultural, but not necessarily "archaeological–site specific" landscape.

The Thompson Plateau Microblade tradition

The review and evaluation of the role, range of distribution and age(s) of microblade technologies in the Similkameen Valley was stimulated by the large assemblage of microblades and microcores in the 6,000 year–long cultural sequence at the Sterling Creek site (DiRa–09). Relative to other Plateau areas, microblades appeared to have continued there for at least a millennium beyond the time when they had generally been discontinued elsewhere. The question asked, at the beginning of these studies, was why would this particular technology have continued here? There must have been some logical reason, or reasons, for it to have continued to have been a preferred local means of tool manufacture and use. In order to evaluate this question it was necessary to conduct a literature review of microblade assemblages in the Plateau, particularly within the Thompson–Fraser–Nicola, Okanagan–Similkameen and northern Columbia regions – although adjacent areas were also investigated.

This review (Chapter 6) indicated that other researchers, locally and globally, provided a testable hypothesis to explain the longevity of Similkameen microblade technology – simply stated, microcores and microblades are an extremely efficient, low–cost and expedient tool–set that served mobile hunter–gatherers' needs for light, portable and easily produced cutting edges. Microblades could be used in–hand or inset into composite tool hafts and used for a multiplicity of cutting tasks on organic substances, whether floral or faunal. Insetting, or hafting, was facilitated by first notching one lateral edge below the striking platform and bulb of percussion, then snapping the proximal end (the "microburin" technique). The recovery of proximal, medial and distal microblade segments across the 6,000 year span of the DiRa–09 occupations is a testament to the ubiquity of this technique.

Microblade–like, or small linear blade–like flakes (cf. Campbell 1985) which resemble microblades also can be produced fortuitously during the manufacture of cores, flakes and bifaces. Some Plateau sites exhibited only microblades, or microblade–like flakes, while others included microcres. While sites with small assemblages of small linear blade–like flakes may not be indicative of a microblade technology, those sites with microcores and microblades provide sufficient evidence of a widespread and long–lived technological tradition over most of the Plateaus. Recognition of microblades without the presence of microcores in assemblages is a problem and the technological attributes to distinguish these from small, linear non–microblades needs to be addressed in future.

Microcores were also likely used as core tools as the fluted edge has been observed to have been utilized, albeit in non–Similkameen archaeological contexts (Chapter 6). This fact led to an initial recognition of a Coquille Microblade tradition in Oregon (Connolly 1986; Pettigrew 1978, 1980, 1981), which was later rescinded (see Chapter 6) even though there was an ethnohistoric connection with an indigenous Athapaskan–speaking population – and most

Athapaskan populations in northcentral British Columbia were certainly past users of this technology (Clark 2001; Magne 2001; Magne and Fedje 2003). The Coquille Microblade tradition and the Cascade Microblade tradition, advocated in Chapter 6, are both regional variants of a long–lived technology which was utilized wherever, and whenever, mobile hunter–gatherers needed a tool–kit that was light enough, and flexibly sufficient for their needs. With the advent of increased sedentism in the Plateau with its emphasis on procurement and storage of salmon, it appears that microblade use declined, especially in river valley bottomlands and in proximity to villages. Only in upland areas where the emphasis continued to be placed on hunting and gathering did microblades continue to be effective technology.

Similkameen–Athapaskan Archaeological Identity

Because some Similkameen First Nations elders (G. Douglas, personal communication 1995) had heard of an hypothesis attempting to link Athapaskan–speakers in the Similkameen with microblade technologies, and that this technology had been uncovered at the Stirling Creek Bridge site (DiRa–09) dating back almost 8,000 years, the author was asked if it was possible to identify ethnicity from the archaeological record. This was the main stimulus for Chapter 7, as well as a concern my some First Nations' individuals that the discovery of alleged "Athapaskan" material culture dating back eight millennia coupled with ethnohistoric Stewix (Similkameen–Athapaskans) might have implications for future land claims. Since ethnohistoric records indicate a Stewix population had once occupied, or co–occupied, the Nicola and Similkameen Valleys establishing a time depth for them, and their identification, was a problem that could be approached through examination of the material culture record.

Athapaskans were not the only Pacific Northwest cultures to utilize microblade technologies as these small, efficient and multi–purpose tools are ubiquitous from fairly early times, except in regions south and east of the main channel of the Columbia River (i.e., the channelled scablands) and the Snake River area. Microblade distributions extend from Alaska and the Yukon south through Coastal and Interior British Columbia and along the eastern flank of the Rocky Mountains south of the 49th Parallel into the Washington–Idaho region. They then trend westward, following the north and west banks of the Columbia River south to the Lower Columbia and continue southward through the Cascade Range to southern Oregon (Chapter 6).

This distribution corresponds with current models of Holocene population movements from the north along the Coast and through the Interior that also roughly corresponds to ethnohistoric Athapaskan distributions (Magne and Fedje 2003; see Chapters 6 and 7). However, this distribution also corresponds to several non–Athapaskan ethnolinguistic areas, especially along the Coast, as well as Sahaptin (Penutian) Columbia Plateau peoples who have likely been in the area for millennia (Hunn 2000; see Chapter 7). As such, simply equating the presence of a microblade technology with Athapaskan–speaking peoples, past and present, is too reductionist a model – even though it likely explains some of the data as there were undoubtedly Athapaskan–speaking migrants settling throughout the Pacific Northwest over the last few millennia (see Chapters 3, 6 and 7). However, equating microblade technology specifically with Athapaskan–speakers is not defensible since those other ethnolinguistic groups within the Plateaus, on the Northwest Coast, in the Subarctic and Arctic used it as well. As such, all microblade technologies are most parsimoniously explained as a result of stimulus diffusion (intermarriage, trade, or other contact mechanisms) between, and among, extant local populations – including Athapaskan–speakers, but not specifically indicative of them.

Chapter 7 outlined several potential material culture markers that could indicate ethnicity. However, each material culture variable could also be explained through diffusion and/or independent invention. Short of having a detailed record of ancient DNA from human remains in all areas of the Plateaus, and across the last 10,000 to 12,000 years, it is unlikely that the type of material culture items (artifacts) left by mobile hunter–gatherers, taken in isolation, would be enough to convincingly indicate past ethnic affiliation – especially over millennia. It was suggested that a multi–factoral approach be considered, where a constellation of material cultural attributes are examined in conjunction with other cultural variables (palaeolinguistics, semiotic studies of mobilary and rock art, house and other feature attributes, and the like). This approach, which is well beyond this dissertation's functional limits, may provide models to the identification of small–scale (i.e., hunter–gatherer) ethnicity in the future.

Concluding Remarks

After more than 200 pages of text, what purpose does this dissertation serve? The answer is two–fold:

1) It provides the first synthesis of an 8,000–10,000 year record of human occupation of the Similkameen Valley and an initial examination of human cultural evolution and adaptation in a biotic system with a lower carrying capacity than adjacent areas which resulted in a core–periphery model of settlement (with the periphery being the study area, the Canadian Similkameen Valley), and
2) An examination and evaluation of the Thompson–Plateau Microblade tradition, first advocated over 30 years ago. The continued use of microblade technology within the Plateaus was likely a reflection of the utility of this tool for mobile hunter–gatherers,

especially in areas not directly associated with fishing such as montane sub–regions like the Similkameen Valley.

Although an attempt was made to examine the archaeological record for clues to determine archaeological indices for ethnicity, the fact that ethnicity tends to be self–ascribed and fluid, changing as cultural values and signifiers evolve, renders such ascription for past Plateau hunter–gatherers inconclusive at best. The main problem inhibiting the development of a model for past Stewix ethnicity is a lack of understanding of how the cultural matrix between and among groups of non–sedentary hunter–gatherer, and sometime–fishers, and the artifact record can be interpreted. Although such etic interpretations are feasible, the question of whether these past peoples' descendants would accept this in current emic perspectives is another question – one that definitely requires more study and contemplation.

– REFERENCES CITED –

Ackerman, L.A.

1994 Nonunilinear descent groups in the Plateau culture area. American Ethnologist 21 (2):286–309.

Ackerman, R.E.

1985 Earliest stone tool industries on the north Pacific Coast of North America. Arctic Anthropology 29 (2): 18–27.

1996 Early maritime culture complexes of the northern Northwest Coast. In Early Human Occupation in British Columbia. R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 123–132.

Aikens, C.M.

1993 Archaeology of Oregon (3rd ed). US Department of the Interior, Bureau of Land Management, Oregon State Office, Eugene.

Allaire, L.

1978 L'Archaeologie des Kitselas d'apres le site stratifie de Gitaus (GdTc:2) Sur la riviere Skeena en Colombie Britannique. National Museum of Man, Mercury Series Archaeological Survey Papers No. 72, Ottawa.

1979 The cultural sequence at Gitans: a case of prehistoric acculturation. In National Museum of Man, Mercury Series Archaeological Survey Papers No. 89, G.F. MacDonald and R.I. Inglis (editors), Ottawa:18–52.

Alley, N.F.

1976 The palynology and palaeoclimatic significance of a dated core of Holocene peat, Okanagan Valley, southern British Columbia, Canadian Journal of Earth Sciences 13: 1131–1144.

Allison, Barbara

1998 Personal communication. Chief, Lower Similkameen Indian Band, Keremeos.

Allison, Charlene

1995 Personal communication. Upper Similkameen Indian Band, Keremeos.

2001 Personal communication. Council member, Upper Similkameen Indian Band, Keremeos.

Allison, Henry.

1999 Personal communication. Lower Similkameen Indian Band, Keremeos.

Allison, S.

1892 Account of the Similkameen Indians of British Columbia. Journal of the Anthropological Institute of Great Britain and Ireland XXI: 305–318.

1976 A Pioneer Gentlewoman in British Columbia: The Recollections of Susan Allison. Edited by Margaret Ormsby. University of British Columbia Press, Vancouver.

Allison–McDiarmid, A.A.
1978 When Great Great Grandma Was A Child. Pulp Press, Vancouver.

Ames, K.M.
1988 Early Holocene forager mobility strategies in the southern Columbia Plateau. In Early Human Occupation in Far Western North America: the Clovis–Archaic Interface, J. Willig, C. Aikens and J. Fagan (editors), Nevada State Museum Anthropological Papers No. 21, Carson City: 325–360.
2000a Review of the Archaeological Data. Kennewick Man Cultural Affiliation Report Chapter 2, Section 1. [http://www.cr.nps.gov/aad/Kennewick/ index.htm].
2000b Review of Archaeological Data "Issues and Problems". Kennewick Man Cultural Affiliation Report ,Chapter 2, Section 3. [http://www.cr.nps.gov/aad/Kennewick/index.htm].
2000c Review of the Archaeological Data "Earlier Group". Kennewick Man Cultural Affiliation Report , Chapter 2, Section 4. [http://www.cr.nps.gov/aad/Kennewick/index.htm].
2000d Review of the Archaeological Record: Continuities, Discontinuities and Gaps. Kennewick Man Cultural Affiliation Report, Chapter 2, Section 6. [http://www.cr.nps.gov/aad/Kennewick/index.htm].

Ames, K.M., D.E. Dumond, J.R. Galm and R. Minn
1998 Prehistory of the Southern Plateau. In Handbook of North American Indians Vol. 12: Plateau, D. Walker (editor). Smithsonian Institution, Washington, D.C.: 103–119.

Ames, K.M., J.P. Green and M. Pfoertner
1981 Hatawai (10NP143): Interim Report. Boise State University Archaeological Reports No. 9, Boise State University, Boise.

Ames, K., M. Graham, R. Kelly, K. Kintigh, V. Steponaitis and P. Walker
2001 Review of Secretary Babbitt's Final Determination of Cultural Affiliation for Kennewick Man. Ms submitted to the US District Court for the District of Oregon 'Bonnichsen v. United States' Civil Case No. 96–1481–JE. [http:rla.unc.edu/personal/vps/appendix.pdf].

Ames, K.M. and A.G. Marshall
1980 Villages, demography and subsistence intensification on the southern Columbia Plateau. North American Archaeologist 2 (1): 25–52.

Ames, K.M. and H.D. Maschner
1999 Peoples of the Northwest Coast: Their Archaeology and Prehistory. Thames and Hudson, London.

Ames, K.M, C.M. Smith, W.L. Cornett and E.A. Sobel.
1999 Archaeological Investigations (1991–1996) at 45Cl1 (Cathlapotle), Clark County, Washington: A Preliminary Report. Wapato Valley Archaeology Project Report #6, Department of Anthropology, Portland State University & U.S. Fish and Wildlife Service.

Anastasio, A.
1972 The southern Plateau: an ecological analysis of intergroup relations. Northwest Anthropological Research Notes 6 (2):109–229.

Anderson, A.C.
1846 Journal of An Expedition Under Command of Alex. C. Anderson of the Hudson's Bay Company, Under Taken with the View of Ascertaining the Practicability of a Communication with the Interior, for the import of Annual Supplies. BCARS, Add. MSS.559, Vol. 2, Folder 1.

Andrefsky, W., Jr.
1987 Diffusion and innovation from the perspective of wedge–shape cores in Alaska and Japan. In The Organization of Core Technology, J.K. Johnson and C. Morrow (editors), Westview Press, Boulder: 12–33.
2004 Materials and Contexts for a Culture History of the Columbia Plateau. In Complex Hunter–Gatherers: Evolution and Organization of Prehistoric Communities on the Plateau of Northwestern North America, W. Prentiss and I. Kuijt (editors), The University of Utah Press, Salt Lake City:23–35.

ARCAS Associates
1983 Bethlehem Copper Corporation Lake Zone Development Heritage Mitigation Study. Permit No. 1982–19. Manuscript on file, Archaeology Branch, Victoria.
1986 Archaeological Excavations at Valley Mine, Highland Valley, B.C: Volumes 1 and 2. Permit No. 1985–5. Manuscript on file, Archaeology Branch, Victoria.
1993 Archaeological Impact Assessment of South Okanagan Substation near Oliver, B.C. Permit No. 1993–2. Manuscript on file. Archaeology Branch, Victoria.
1997 Okanagan Timber Supply Area Archaeological Overview Assessment. Non–permit. Archaeology Branch, Victoria.

Arnold, J.E.
2004 A Transcontinental perspective on the evolution of hunter–gatherer lifeways on the Plateau: discussion and reflection. In Complex Hunter–Gatherers: Evolution and Organization of Prehistoric Communities on the Plateau of Northwestern North America, W.C. Prentiss and I. Kuijt (editors), The University of Utah Press, Salt Lake City:171–181.

Babbitt, B.
2000 Letter from Secretary of the Interior Bruce Babbitt to Secretary of the Army Louis Caldera regarding disposition of the Kennewick Human Remains, Appendix 3: Human Culture in the Southeastern Columbia Plateau, 9500–9000 BP and the Cultural Affiliation with Present–Day Tribes. [http://www.cr.nps.gov/aad/Kennewick/index.htm].

Bacon, C.R.
1983 Eruptive history of Mount Mazama and Crater Lake caldera, Cascade Range, USA. Journal of Volcanology and Geothermal Research 18: 57–115. [http://vulcan.wr.usgs.gov/Volcanoes/CraterLake/ Publications/ BaconJVGR83/table_eruptive_hist.html].

Bahn, P.G.
1997 Journey Through the Ice Age. Weidenfeld and Nicolson, London.

Bailey, J.D and M. Will
1993 An Archaeological Impact Assessment Study for the Ministry of Transportation and Highways Proposed Clifton Prospect Gravel Extraction Project near Keremeos, South–central B.C. Manuscript on file, Archaeology Branch, Victoria.

Bamforth, D. and P. Bleed
1997 Technology, flaked stone technology and risk. In Rediscovering Darwin: Evolutionary Theory and Archaeological Explanation, C. Barton and G. Clark (editors), Archaeological Papers of the American Anthropological Association 7, Arlington.

Barlee, B.
1974 Personal communication. Canada West Magazine owner/editor, Kelowna.

Barth, F.
1969 Ethnic Groups and Boundaries: The Social Organization of Cultural Differences. Little Brown, Boston.
1994 Enduring and emerging issues in the analysis of ethnicity. In The Anthropology of Ethnicity: Beyond "Ethnic Groups and Boundaries", H. Vermeulen and C. Govers (editors), Het Spinhuis, Amsterdam.

Baxter, P.W.
1986 Archaic Upland Adaptations in the Central Oregon Cascades. Unpublished Ph.D dissertation, University of Oregon, Dept. of Anthropology. Eugene.

BC Archives Cartographic Map – A1832
1859 Map of a Portion of BC / compiled from the surveys and explorations of the Royal Navy and Royal Engineers, at the camp, New Westminster Novr. 24th 1859. [http://www.bcarchives.gov.bc.ca/cartogr/img_html/ Dir_1/cm_a1832.htm].

Beauchamp, R.
1978 Project Standing Rock (DhQx–08). Permit No. 1978–8. Manuscript on file, Archaeology Branch, Victoria.

Beck, C. and G.T. Jones
1997 The terminal Pleistocene/early Holocene archaeology of the Great Basin. Journal of World Prehistory 11 (2):161–236.

Beckham, S. D., R. Minor and K. A. Toepel
1981 Prehistory and History of BLM Lands in West–Central Oregon: A Cultural Resource Overview. University of Oregon Anthropological Papers No. 24, Eugene.

Beirne, P.D. and D.L. Pokotylo
1979 Hat Creek Project: Inventory, Assessment and Evaluation of Cultural Resources. B.C. Hydro and Power Authority Environmental Impact Statement Reference No. 60, Vancouver. [http://www.em.gov.bc.ca/ dl/COALreports/hcl060.pdf].

Bense, J.
1972 The Cascade Phase: A Study in the Effects of the Altithermal on a Cultural System. Unpublished PhD dissertation, Washington State University, Dept.of Anthropology, Pullman.

Bergland, E.O.
1983 Summary Prehistory and Ethnography of Olympic National Park, Washington. U.S. National Park Service, Pacific Northwest Region, Division of Cultural Resources, Seattle.

Bettinger, R.L.
1980 Explanatory/predictive models of hunter–gatherer adaptation. In Advances in Archaeological Method and Theory: Volume 3. M. Schiffer (editor), Academic Press, New York:189–255.
1991 Hunter–Gatherers: Archaeological and Evolutionary Theory. Plenum Press, New York.

Binford, L.R.
1977 For Theory Building in Archaeology: Essays on Faunal Remains, Aquatic Resources, Spatial Analysis and Systemic Modeling. Academic Press, New York.
1978 Nunamiut Ethnoarchaeology. Academic Press, New York.
1979 Organization and formation process: looking at curation technologies. Journal of Anthropological Research 35:255–273.
1980 Willow smoke and dog's tails: hunter–gatherer settlement systems and archaeological site formation. American Antiquity 45 (1):4–20.
1981 Bones: Ancient Men and Modern Myths. Academic Press, New York.
2001 Constructing Frames of Reference: An Analytical Method for Archaeological Theory Building using Ethnographic and Environmental Data Sets. University of California Press, Berkley.

Bleed, P.
1986 The optimal design of hunting weapons. American Antiquity 51 (4): 737–747.

Boas, F.
1895 Fifth Report on the Indians of British Columbia. 65th Annual Report of the British Association for the Advancement of Science for 1895, London:522–592.
1905 The Jesup North Pacific Expedition. Proceedings of the 13th International Congress of Americanists, New York, 1902, Eschenbach, Easton: 90–100.
1922 Anthropological notes. American Anthropologist (New Series) 24 (4): 490–497.
1924 Vocabulary of an Athapaskan tribe of Nicola Valley, British Columbia. International Journal of American Linguistics 3 (1):36–38.

Bolnick, D.A., B.A. Shook and L.C. Goddard
2004 Problematic use of Greenberg's linguistic classification of the Americas in studies of native American genetic variation. American Journal of Human Genetics 75 (3):519–523.

Bonnichsen, R. and K. Turnmire
1999 An Introduction to the Peopling of the Americas. In Ice Age People of North America, R. Bonnichsen and K. Turnmire (editors), Oregon State University Press, Corvallis:1–26.

Borden, C.E.
1952 Results of archaeological investigations in central British Columbia, 1952. Anthropology in British Columbia Memoir 3:31–43.
1968 New evidence of early cultural relations between Eurasia and western North America. Proceedings, VIII International Congress of Anthropological and Ethnological Sciences, S–11 Northern Eurasia and Northern America: 331–337.
1969 Early population movements from Asian into western North America. Syesis 2: 1–13.
1970 Cultural History of the Fraser–Delta Region: An Outline. In Archaeology in British Columbia: New Discoveries, R.L. Carlson (editor), B.C Studies 6–7 (Fall–Winter), Vancouver.
1975 Origins and Development of early Northwest Coast Culture to about 3000 BC. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 45, Ottawa.

Boreson, K.
1992 A Report of Test Excavations at Three Sites near Enloe Dam on the Similkameen River, Okanogan County, Washington. Short Report SR–282, Archaeological and Historical Services, Eastern Washington University, Cheney.

Bouchard, R. and D. Kennedy
1975 Utilization of Fish by the Colville Okanogan Indian People. B.C. Indian Languages Project, Victoria.
1984 Indian History and Knowledge of the Lower Similkameen River – Palmer Lake Area. U.S. Army Corps of Engineers, North Pacific Division, Seattle and B.C. Indian Languages Project, Victoria.

Bourdieu, P.
1977 Outline of a Theory of Practice. Cambridge University Press, Cambridge.
1990 The Logic of Practice. Polity Press, Cambridge.

Boxberger, D.L.
2000 Review of Traditional Historical and Ethnographic Information. Kennewick Man Cultural Affiliation Report Chapter 3, Section 1 [http://www.cr.nps.gov/aad/Kennewick/index.htm].

Boyd, R.
1985 The Introduction of Infectious Diseases among the Indians of the Pacific Northwest: 1774–1874. Unpublished Ph.D dissertation, University of Washington, Dept. of Anthropology, Seattle.

British Columbia
1916 Report of the Royal Commission on Indian Affairs for the Province of British Columbia: Volume III. Acme Publishing Company, Victoria.

Brolley, R.P.
1981 Report of the 1981 Southern Interior Survey: Final Report on Heritage Impact Assessments in the Thompson–Okanagan and Kootenay Resource Management Regions for the Heritage Conservation Branch. Manuscript on file, Heritage Conservation Branch, Victoria.

Browman, D. and D. Munsell
1969 Columbia Plateau prehistory: cultural development and impinging influences. American Antiquity 34 (3):249–264.
1972 Columbia Plateau prehistory: some observations. American Antiquity 37 (4):546–548.

Brunton, B.B.
1998 Kootenai. In Handbook of North American Indians Volume 12: Plateau, D.E. Walker Jr. (editor), Smithsonian Institution, Washington DC:223–237.

Bussey, J.
1987 Heritage Resource Impact Assessment Report: Ministry of Highways Kamloops Region, Proposed Gravel Reserve (Lot 1795s), Old Hedley Road. Manuscript on file, B.C. Heritage Conservation Branch, Victoria.
1989 Heritage Resource Inventory and Impact Assessment Lot A, District Lot 701s, Old Hedley Road, Princeton. Permit No. 1989–58. Manuscript on file, Archaeology Branch, Victoria.
1995 Systematic Data Recovery at EeRf 1 Savona, B.C.: Volumes 1 and 2. Permit No. 1994–35. Manuscript on file, Archaeology Branch. Victoria.

Bussey, J., G. Prager and S. Copp
2002 Archaeological Investigations BC Gas Inland Pacific Connector Project Kilometre 0 to 120: Initial Report of Investigations. Permit No. 2002–261. Manuscript on file, Archaeology Branch, Victoria.
2004 Archaeological Investigations BC Gas Inland Pacific Connector Project Kilometre 0 to 120: Final Report of Investigations. Permit No. 2002–261. Manuscript on file, Archaeology Branch, Victoria.

Butler, B.R.
1961 The Old Cordilleran Culture in the Pacific Northwest. Occasional Papers of the Idaho State College Museum No. 5, Pocatello.
1962 Contributions to the Prehistory of the Columbia Plateau – Palouse and Craig Mountain Areas. Occasional Papers of the Idaho State Museum No. 9, Pocatello.
1965 The structure and function of the Old Cordilleran Culture concept. American Antiquity 67: 1120–1130.
1969 The earlier cultural remains at Cooper's Ferry. Tebiwa 12 (2):35–50.

Butler, V.E. and J. L. O'Connor
2004 9,000 years of salmon fishing on the Columbia River. Quaternary Research 62: 1–8.

Caldwell, W.
1954 An Archaeological Survey of the Okanagan and Similkameen Valleys of British Columbia. Anthropology in B.C. No. 4: 10–25.
1956 The Archaeology of Wakemap, a stratified site near the Dalles of the Columbia. Unpublished Ph.D dissertation, University of Seattle, Dept. of Anthropology, Washington.

Caldwell, W. and O. Mallory
1967 Hells Canyon Archaeology. Smithsonian Institution, River Basin Surveys, Publications in Salvage Archaeology 6, Washington, D.C.

Callahan, E.
1985 Experiments with Danish Mesolithic microblade technology. Journal of Danish Archaeology 4: 23–39.

Campbell, S.
1985 Research Design for the Chief Joseph Dam Cultural Resources Project. Office of Public Archaeology, University of Washington, Seattle.
(editor) Summary Report, Chief Joseph Dam Cultural Resources Project. Office of Public Archaeology, University of Washington, Seattle.
1990 PostColumbian Culture History in the Northern Columbia Plateau A.D. 1500–1900. Garland Publishing, Inc., New York.

Cannings, R.A. and Cannings, S.G.
1996 British Columbia: A Natural History. Greystone Books, Vancouver.

Carfantan, M.
1977 An Archaeological Resource Inventory in the Thompson–Okanagan Region of British Columbia. Manuscript on file, Archaeological Sites Advisory Board, Victoria.

Carl, G.C., W.A. Clemens and C.C. Lindsey
1959 The fresh–water fishes of British Columbia. British Columbia Provincial Museum Handbook No. 5, Queen's Printer, Victoria.

Carlson, C.C. and K. Klein
1996 Late Pleistocene salmon of Kamloops Lake. In Life in Stone: A Natural History of British Columbia's Fossils, R. Ludvigson (editor), UBC Press, Vancouver.

Carlson, R.L.
1960 Chronology and culture change in the San Juan Islands, Washington. American Antiquity 25 (4):562–586.
1979 The Early Period on the central Coast of British Columbia. Canadian Journal of Archaeology 3:211–228.
1983a Prehistory of the Northwest Coast. In Indian Art Traditions of the Northwest Coast, R.L. Carlson (editor), Archaeology Press, Simon Fraser University, Burnaby:13–32.
1983b The Far West. In Early Man in the New World, R. Shutler , Jr. (editor), Sage Publications, Beverly Hills: 73–96.
1988 The view from the North. In Early Human Occupation in Far Western North America: the Clovis–Archaic Interface, J.A. Willig, C.M. Aiken and J.L. Fagan (editors), Nevada State Museum Anthropological Papers No.21, Carson City: 319–324.
1990 Cultural Antecendents. In Handbook of North American Indians Volume 7: Northwest Coast, W. Suttles (editor), Smithsonian Institution, Washington DC:60–69.
Issues in Northwest Coast prehistory [review of Matson and Coupland
1995 Issues in Northwest Coast prehistory [review of Matson and Coupland (1994)]. The Review of Archaeology 16 (2): 13–18.
1996a Introduction to Early Human Occupation in British Columbia. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver:3–10.
1996b Early Namu. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver:83–102.

1996c The First British Columbians. In The Pacific Province: A History of British Columbia, H.J.M Johnston (editor), UBC Press, Vancouver:12–46.
1998a Microblade tradition. In Archaeology of Prehistoric Native America: An Encyclopedia, G. Gibbon (editor), Garland Publishing, Inc., New York: 514–515.
1998b Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.
2000 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.
2001 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.
2006 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.

Carlson, R.L. and L. Dalla Bona (editors)
1996 Early Human Occupation in British Columbia. UBC Press, Vancouver.

Carstens, P.
1991 The Queen's People. A Study of Hegemony, Coercion, and Accommodation among the Okanagan of Canada. University of Toronto Press, Toronto.

Chance, D.H. and J.V. Chance
1977 Kettle Falls 1976: Salvage Archaeology in Lake Roosevelt. University of Idaho Laboratory of Anthropology Research Manuscript Series No. 39, Moscow.
1979 Kettle Falls 1977: Salvage Archaeology in and beside Lake Roosevelt. University of Idaho Laboratory of Anthropology Research Manuscript Series No. 53, Moscow.
1982 Kettle Falls 1971 and 1974: Salvage Archaeology in Lake Roosevelt. University of Idaho Laboratory of Anthropology Paper #69, Moscow.
1985 Kettle Falls: 1978. University of Idaho Anthropological Reports #84, Moscow.

Chatters, J.
1984 Human Adaptation Along the Columbia River 4700–1600 BP. Central Washington University Graduate Studies and Research Reports #84–1, Ellensburg.
1986 The Wells Reservoir Archaeological Project, Volume 1: Summary of Findings. Central Washington University Archaeological Report 86–6, Ellensburg.
1989 Resource intensification and sedentism on the southern Plateau. Archaeology in Washington 1:3–19.
1995 Population growth, climatic cooling and the development of collector strategies on the southern Plateau. Journal of World Prehistory 9 (3):341–400.
2000 The recovery and first analysis of an early Holocene skeleton from Kennewick, Washington. American Antiquity 65 (2): 291–316.

Chatters, J. and D. Pokotylo
1998 Prehistory: Introduction. In Handbook of North American Indians Volume 12: Plateau, D.E. Walker, Jr. (editor), Smithsonian Institution, Washington DC:73–80.

Chisholm, B.S.
1986 Reconstruction of Prehistoric Diet in British Columbia using Stable Isotopic Analysis. Unpublished Ph.D dissertation, Simon Fraser University, Dept. Archaeology, Burnaby.
1987 Personal Communication. Simon Fraser University, Dept. of Archaeology, Burnaby.
2006 Personal Communication. University of British Columbia, Dept. of Anthropology, Vancouver.

Chisholm, B. and E. Nelson

1983 An early human skeleton from south–central British Columbia: dietary inference from carbon isotope evidence. Canadian Journal of Archaeology 7 (1):85–86.

Choquette, W.

1996 Early post–glacial habitation of the upper Columbia region. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 45–50.

Clague, J., S. Evans, V. Rampton and G. Woodsworth

1995 Improved age estimates for the White River and Bridge River tephras, Western Canada. Canadian Journal of Earth Sciences 32: 1172–1179.

Clark, D.W.

1992 Western Subarctic Prehistory. Canadian Museum of Civilization, Hull.

2001 Microblade–culture systematics for Northwestern America. In A Collection of Papers Presented at the 33rd Annual Meeting of the Canadian Archaeological Association, J. Pilon, M. Kirby and C. Theriault (editors), The Ontario Archaeological Society Inc., Ottawa: 179–186.

Clark, D.W. and R.M. Gotthardt

1999 Microblade Complexes and Traditions in the Interior Northwest as Seen from the Kelly Creek Site, West–central Yukon. Occasional Papers in Archaeology No. 6, Heritage Branch, Government of the Yukon, Whitehorse.

Cline, W., R. Commons, M. Mandelbaum, R. Post and L. Walters

1938 The Sinkaietk or southern Okanogan of Washington. General Series in Anthropology No. 6, Contributions from the Laboratory of Anthropology No. 2, George Banta Publishing Company, Menasha.

Coad, B.W.

1995 Encyclopedia of Canadian Fishes. Canadian Museum of Nature, Ottawa.

Connolly, T.

1986 Cultural Stability and Change in the Prehistory of southwest Oregon and northern California. Unpublished PhD dissertation. University of Oregon, Dept. of Anthropology, Eugene.

1991 The Standley Site (35D0182): Investigations into the Prehistory of Camas Valley, Southwest Oregon. Anthropological Papers No. 43, University of Oregon, Eugene.

1999 Newberry Crater: A Ten–Thousand–Year Record of Human Occupation and Environmental Change in the Basin Plateau Borderlands. University of Utah Anthropological Papers No. 121, University of Utah Press, Salt Lake City.

Connolly, T., J. Benjamin, B. O'Neill and D. Jenkins

1994 Archaeological Investigations at Two Sites on the Upper Rogue River (35JA189 and 35JA190), Southwest Oregon. University of Oregon Anthropological Papers No. 48, Eugene.

Cook, J.P.
1968 Some microblade cores from the Western Boreal Forest. Arctic Anthropology 5 (1):121–127.
1969 The Early Prehistory of Healy Lake, Alaska. Unpublished Ph.D dissertation, Department of Anthropology, University of Wisconsin.
1975 Archaeology of interior Alaska, Western Canadian Journal of Anthropology 5: 125–133.

Copp, S.A.
1975 An Archaeological Site Survey of the Okanagan–Similkameen Regions in the Interior of B.C. Permit No. 1974–6. Manuscript on file, Archaeology Branch, Victoria.
1979 Archaeological Excavations at the McCall Site, South Okanagan Valley, British Columbia. Unpublished MA thesis, Simon Fraser University, Dept. Archaeology, Burnaby.
1994 Archaeological Impact of the Proposed Stirling Creek Bridge Project near Hedley, British Columbia: A Preliminary Report of Investigations. Permit No. 1994–069. Manuscript on file, Archaeology Branch, Victoria.
1995 The 1995 Excavations of the Stirling Creek Bridge Site (DiRa–09): A Preliminary Report of Investigations. Permit No. 1995–148. Manuscript on file, Archaeology Branch, Victoria.
1996a Tulameen Valley Forestry Cut Blocks Impact Assessment: A Final Report of Investigations. Manuscript on file, Archaeology Branch, Victoria.
1996b The 1995 Excavations of the Stirling Creek Bridge Site (DiRa–09): A Final Report of Investigations. Permit No. 1995–148, Manuscript on file, Archaeology Branch, Victoria.
1996c Preliminary Archaeological Inspection, Wolfe Lake Reserve, Upper Similkameen Valley. Manuscript on file, Upper Similkameen Indian Band, Keremeos.
1997a A Pre–Mazama Plateau Microblade Tradition Site: Upper Similkameen Valley, British Columbia. Paper presented at the 50th Northwest Anthropological Conference, Ellensburg.
1997b Archaeological Inspection Survey (AIS) of Weyerhaeuser Canada Ltd. Forestry Blocks, Jacob Creek Area, Upper Similkameen Valley, B.C. Report prepared for Weyerhaeuser Canada Ltd (Princeton), Princeton .
1997c Archaeological Impact Assessment, Winters Creek Area, Similkameen Valley, B.C. Manuscript on file, Points West Consulting, Langley, B.C.
1997d Archaeological Impact Assessments (1997), Merritt Forest District Small Business Forest Enterprise Program, Nicola Valley, B.C.: Final Report of Investigations. Permit #1997–247. Manuscript on file, Archaeology Branch, Victoria.
1997e Archaeological Impact Assessment (AIA), Ministry of Transportation and Highways Golddust Gravel Pit, Upper Similkameen Valley, B.C. Permit #1997–144. Manuscript on file, Archaeology Branch, Victoria and Ministry of Transportation and Highways (Thompson–Okanagan), Kamloops.
1998a B.C. Gas Utility Ltd. Natural Gas Pipeline Corridor Archaeological Impact Assessment, Ashnola and Blind Creek Indian Reserves, Lower Similkameen Valley, B.C.: A Final Report of Investigations. Non–permit. Manuscript on file, B.C. Gas Utility Ltd.,Vancouver.
1998b Archaeological Field Reconnaissance, Tulameen Coal Project: a final report of investigations. Non–permit. Report submitted to J. Harris and Associates per Royal Scot Minerals Inc, the Upper Similkameen Indian Band, B.C. Ministry of Energy and Mines and the Archaeology Branch (Ministry of Small Business, Tourism and Culture), Victoria.

1998c Archaeological Reconnaissance, Ministry of Forests (Merritt District) Tulameen Block A57445–1. Non–permit. Ministry of Forests (Merritt District), Merritt.

1998d Archaeological Inspection Survey, Ministry of Forests (Merritt District) Chain, Link and Osprey Lakes Recreation Camps. Permit No. 1998–251. Manuscript on file. Archaeology Branch (Ministry of Small Business, Tourism and Culture), Victoria.

1998e Archaeological Inspection Survey (AIS), Weyerhaeuser Canada Ltd. (Princeton) CPP 655 Blocks 3A–C. Permit No. 1998–296. Manuscript on file, Archaeology Branch (Ministry of Small Business, Tourism and Culture), Victoria.

1998f Tcutcuwi'xa Rock Shelter (DhRa–02) Test Excavations. Non–permit. Manuscript on file, Upper Similkameen Indian Band, Keremeos.

1998g Field Reconnaissance of Kennedy Lake (South), Whipsaw Chart. Non–permit. Manuscript on file, Ministry of Forests (Merritt District), Merritt.

1999a Preliminary Archaeological Field Reconnaissance TSL A45592–1. Non–permit. Manuscript on file, Ministry of Forests (Merritt District), Merritt.

1999b Preliminary Archaeological Reconnaissance of the Wolfe–Belgie and Copper Creek Areas. Non–permit. Manuscript on file, Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

1999c Preliminary Archaeological Reconnaissance of the Pasaytan River Area. Non–permit. Manuscript on file, Ministry of Forests Small Business (Merritt District), Merritt.

1999d Preliminary Archaeological Reconnaissance of the Rampart Lake Forest Recreation Camp. Non–permit. Manuscript on file, Ministry of Forests (Merritt District), Merritt.

1999e Archaeological Evaluation of the Golddust Gravel Pit (DhRd–04), Upper Similkameen Valley. Non–permit. Manuscript on file, Ministry of Forests (Merritt District), Merritt.

1999f Archaeological Evaluation of CP 10–3, 14–5, 8–1 and 8–3. Non–permit. Manuscript on file, Riverside Forest Products Ltd., Kelowna.

1999g Preliminary Archaeological Reconnaissance CP 673–17. Non–permit. Manuscript on file, Weyerhaeuser Canada Ltd. (Princeton Division), Princeton.

1999h Archaeological Reconnaissance of the Wolfe–Belgie, Copper Creek and Pasayten River Areas. Non–permit. Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

1999i An Archaeological Overview Assessment of Selected Cut Blocks, Pasayten River. Non–permit. Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

1999j Preliminary Field Reconnaissance A45592–1, Upper Similkameen Valley. Non–permit. Manuscript on file, Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

1999k Preliminary Field Reconnaissance A62340–1, Calcite Creek, Similkameen Valley. Non–permit. Manuscript on file, Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

1999l The 1999 Langara College Archaeology Field School: Report of Investigations at DiRa–20 (Snazai'st Village), Upper Similkameen Valley, B.C. Non–permit. Manuscript on file, Langara College, Vancouver.

2000a Preliminary Field Reconnaissance: TSL A62339 Blocks 1 and 2, Calcite Creek, Upper Similkameen Valley, B.C. Non–permit. Manuscript on file, Ministry of Forests Small Business Forest Enterprise Program (Merritt District), Merritt.

2000b Excavations at Snazai'st Village (DiRa–20): 1999. Non–permit. Manuscript on file, Upper Similkameen Indian Band, Keremeos.

2000c Whipsaw Creek Archaeological Inventory Study 1999. Permit No. 1999–258. Manuscript on file, Archaeology Branch (Ministry of Small Business, Tourism and Culture), Victoria.

2000d Excavations of the Princeton Golf Club Springs site (DiRc–66). Permit No. 2000–161. Manuscript on file, Archaeology Branch (Ministry of Small Business, Tourism and Culture), Victoria.

2000e Archaeological Impact Assessment (DiRc–66) Princeton Golf Club: Final Report of Investigations. Permit No. 2000–161. Manuscript on file, Archaeology Branch, Victoria.

2000f The 2000 Langara College Archaeology Field School: Report of Investigations, DiRa–20 (Snazai'st Village), Upper Similkameen Valley, B.C. Non–permit. Manuscript on file, Langara College, Vancouver.

2001a Archaeological Impact Assessments of Six Forestry Recreation Camps, Ashnola River, Lower Similkameen Valley, B.C. Permit #200–369. Manuscript on file. Archaeology and Registry Services Branch, Victoria.

2001b Archaeological Field Reconnaissance and Overview Assessment (FL A18671, CPs 172–15, 181–1, 181–2, 314–1 and 314–9). Non–permit. Gorman Brothers Lumber Ltd., Westbank.

2001c Archaeological Field Reconnaissance of the Proposed Guichon Site 97.1 Capacitor Station near Logan Lake, B.C. Non–permit. White Pine Environmental Resources Ltd., Vancouver.

2002a Archaeological Impact Assessments of Three Crown Lots near Princeton and Hedley, B.C. Permit #2001–138. Manuscript on file, Archaeology and Registry Services Branch, Victoria.

2002b Archaeological Field Investigations: IR #7 (Skemeoskuankin Reserve), Lower Similkameen Valley, B.C. Non–permit. Manuscript on file, Lower Similkameen Indian Band Natural Resources Department, Keremeos.

2003a Results of the 2003 Langara College Archaeology Field School: Ashnola River Surveys and Cool Creek (DhQx–10) Excavations. Non–permit. Manuscript on file. Langara College, Vancouver and Lower Similkameen Indian Band, Keremeos.

2003b Archaeological Overview Assessments of Gorman Brothers Lumber Ltd. CP 26. Blocks 1 to 9. Non permit. Manuscript on file, Itkus Heritage Consulting, Port Moody.

2004 Archaeological Impact Assessments of Gorman Brothers Lumber Ltd. Ashnola River Watershed Cut Blocks: 2004. Permit No. 2004–365. Manuscript on file, Archaeology Branch, Victoria.

2006 Salvage recovery of found human remains, Keremeos, B.C. (Burial No. 2006–8B: an initial report of investigations. Permit No. 2006–219. Manuscript on file, Archaeology Branch, Victoria.

Copp, S. and G. Gould

2000 Archaeological Impact Assessment TSL A505212–04: Interim Report. Permit No. 2000–352. Manuscript on file, Archaeology Branch, Victoria.

Copp, S. and D. Hudson

1995a Archaeological Reconnaissance of the Murphy (Bear) Lakes Area, Near Tulameen, British Columbia. Non–permit. A report of investigations prepared for Tolko Industries and the Upper Similkameen Indian band. Manuscript on file. Archaeology Branch, Victoria.

1995b An Archaeological Site Survey and Impact Assessment of Areas Associated with Test Drill Sites X95–01 to X95–10, Homestake–Nickel Plate Mines of Canada, Inc. Permit #1995–192, Manuscript on file. Archaeology Branch, Victoria.

1995c Archaeological Inspection Survey, B.C. Gas Pipeline, Lower Similkameen Valley. Manuscript on file. Lower Similkameen Indian Band, Keremeos.

Copp, S., D. Hudson and R. Webber

1993 An Archaeological Impact Assessment for the Proposed Highway 3 Development Project, Chuchuwayha Indian Reserve No. 2, Near Hedley, South–central British Columbia. Permit No. 1993–106, Manuscript on file. Archaeology Branch, Victoria.

1994 Archaeological Impact of the Proposed Stirling Creek Bridge Project near Hedley, British Columbia. Permit No. 1994–069, Manuscript on file. Archaeology Branch, Victoria.

1995a Archaeological Reconnaissance of the Proposed Business Park Development near Princeton, British Columbia. Permit No. 1995–144, Manuscript on file. Archaeology Branch, Victoria.

1995b Archaeological Survey of Portions of I.R. #9 (Standing Rock Locality). Report by facsimile (fax) to the Lower Similkameen Indian Band, B.C. Telephone Company and the Archaeology Branch of B.C. dated 24 May 1995. Manuscript on file, Itkus Heritage Consulting, Port Moody.

1995c Archaeological Excavations of the Snazai'st Village Site (DiRa–20): 1995. Manuscript on file, Upper Similkameen Indian Band, Keremeos.

Cormie, A.B.

1981 Chemical Correlation of Volcanic Ashes for use as Stratigraphic Markers in Archaeology. Unpublished MA thesis, Simon Fraser University, Dept. of Archaeology, Burnaby.

Corner, J.

1968 Pictographs (Indian Rock Paintings) in the Interior of British Columbia. Wayside Press, Vernon.

1969 Pictographs (Indian Rock Paintings) in the Interior. Permit No. 1969–12, Manuscript on file with the Archaeology Branch, Victoria.

Coupland, G.

1996 The Early Prehistoric Occupation of Kitselas Canyon. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver:159–166.

Cowan, I.M. and C. Guiguet

1973 The Mammals of British Columbia. British Columbia Provincial Museum Publication No. 11, Victoria.

Crabtree, D.

1982 An Introduction to Flintworking. Occasional Papers of the Idaho Museum of Natural History No. 28 (2nd edition), Pocatello.

Creamer, H.

1990 Aboriginal perceptions of the past: the implications for cultural resource management in Australia. In The Politics of the Past, P. Gathercole and D. Lowenthal (editors), Unwin Hyman, London: 130–140.

Cressman, L.
1973 An Approach to the Study of Far Western North American Prehistory. University of Oregon Museum of Natural History Bulletin No. 20, Eugene.
1977 Prehistory of the Far West: Homes of Vanished Peoples. University of Utah Press, Salt Lake City.

Cressman, L., D. Cole, W. Davis, T. Newman and D. Scheans
1960 Cultural Sequences at the Dalles, Oregon: A Contribution to Pacifica Northwest Prehistory. Transactions of the American Philosophical Society 50 (10), Philadelphia.

Croes, D.
1995 The Hoko River Archaeological Site Complex: The Wet/Dry Site (45CA213), 3,000–1,700 BP. Washington State University Press, Pullman.
2003 Hoko River Digital Archive. South Puget Sound Community College, Olympia. [http://spscc.ctc.edu/anthropology/wetsite].

Croes, D. and S. Hackenberger
1988 Hoko River archaeological complex: modelling prehistoric Northwest Coast economic evolution. Research in Economic Anthropology, Supplement 3:19–86.

Cybulski, J., D. Howes and J. Haggarty
1981 An early human skeleton from south–central British Columbia: dating and bioarchaeology inference. Canadian Journal of Archaeology 5:49–59.

Dalan, R.
1985 Pollen analysis of a core from Goose Lake, Okanogan County, Washington. In Summary of Results, Chief Joseph Dam Cultural Resources Project, Washington, S. Campbell (editor), Office of Public Archaeology, Institute for Environmental Studies, University of Washington, Seattle:113–129.

Dalla Bona, L.
1994 Ministry of Natural Resources Archaeological and Predictive Modelling Program Volume 3: Methodological Considerations. Ontario Ministry of Natural Resources, Centre for Archaeological Resource Prediction, Thunder Bay. [http://www.pictographics.com.apmp.files/apmp. homepage].

Dandurand, T., D. Schaepe, P. Rapp, C. Bernister, S. Wilson and L. MacGregor
1999 Final Report for the 1999 Stave Reservoir Archaeological Inventory and Monitoring Project. Permit No. 1999–22. Manuscript on file. Archaeology Branch, Ministry of Sustainable Resources, Victoria.

Daugherty, R.D.
1956a Early Man in the Columbia Intermontane Province. University of Idaho Anthropological Papers #24, Salt Lake City.
1956b Archaeology of the Lind Coulee site, Washington. Proceedings of the American Philosophical Society 100 (3):223–278.
1962 The Intermontane Western Tradition. American Antiquity 28 (2):144–150.

Daugherty, R.D., J.J. Fleniken and J.M. Welch
1987a A Data Recovery Study of Layser Cave (45LE223) in Lewis County, Washington. USDA Forest Service Studies in Resource Management No. 7, Portland.
1987b A Data Recovery Study of Judd Peak Rockshelters (45–LE–22) in Lewis County, Washington. USDA Forest Service Studies in Cultural Resource Management No. 8, Portland.

David, N., J.A. Sterner and K.B. Gavua
1988 Why pots are decorated. Current Anthropology 29 (3):365–389.

Davis, C.
1975 Some notes on Plateau Athapaskans. In Proceedings: Northern Athapaskan Converence, 1971, Volume 2, A. Clark (editor), National Museum of Man Mercury Series Ethnology Service Paper 27, Ottawa.

Dawson, G.M.
1891 Notes on the Shuswap People of British Columbia. Proceedings and Transactions of the Royal Society of Canada for the Year 1891 Sec.1, Vol. 9 (Sec. 2: Papers for 1891), Montreal:3–44.
1898 Historical notes on the Yukon District (reprinted from the Review of Historical Publications Relating to Canada Volume 2, publications of the year 1897 – microfiche), University of Toronto, Toronto.

Demarchi, D.A.
1993 Ecosections of British Columbia: Third Approximation. B.C. Ministry of Environment, Lands and Parks, Wildlife Branch, Victoria.
1996 An Introduction to the Ecoregions of British Columbia. BC Ministry of Environment, Lands and Parks, Victoria. [http://www.env.gov.bc.ca/wld/ his/bcecoreg.html].

De Vos, G.
1975 Ethnic pluralism: conflict and accommodation. In Ethnic Identity: Cultural Continuities and Change. Mayfield Publishing Co., Palo Alto:5–41.

Dennis, Robert Sr.
2001 Personal Communication. Elder (***Keyoh***), Lower Similkameen Indian Band, Keremeos.

Dennis, Robert K.
2000 Personal Communication: Lower Similkameen Indian Band, Keremeos.
2002 Personal Communication: Lower Similkameen Indian Band, Keremeos.
2004 Personal Communication: Lower Similkameen Indian Band, Keremeos.

De Paoli, M.
1999 Beyond Tokenism: Aboriginal Involvement in Archaeological Resource Management in British Columbia. Unpublished MA Thesis, University of British Columbia, School of Community and Regional Planning, Vancouver.

Dixon, E.J.
1999 Bones, Boats and Bison: Archaeology and the First Colonization of Western North America. University of New Mexico Press, Albuquerque.

Donahue, P.F.
1973 Ulgatcho: an archaeological outline. Syesis 6:154–178.
1975 Concerning Athapaskan prehistory in British Columbia. Western Canadian Journal of Anthropology 5 (3–4):21–63.
1977 4500 Years of Cultural Continuity on the Central Interior Plateau of British Columbia. Unpublished PhD dissertation. University of Wisconsin, Madison.
1978 Alaska and Northwest Coast. In Ancient Native Americans, J. Jennings (editor), W.H. Freeman Co., San Francisco:42–93.

Douglas, Glenn
1995 Personal Communication. Okanagan–Similkameen elder in residence, Enowkin Cultural Centre, Penticton.

Duff, W.
1969 The Indian History of British Columbia, Volume 1: The Impact of the White Man. Anthropology in British Columbia Memoir 5, Victoria.

Dumond, D.E.
1969 Toward a prehistory of the Na–Dene, with a general comment on population movements among nomadic hunters. American Anthropologist 71 (5): 857–863.
1977 The Eskimos and Aleuts. Thames and Hudson, London.

Dyer, O.
1998 Mammals. In Assessment of Species Diversity in the Montane Cordillera Ecozone, I.M. Smith and G.G. Scudder (editors), Ecological Monitoring Assessment Network, Burlington. [http://www.cciw.ca/emantemp/ reports/publications/99_montane/ mammals/mammals10.html].

Echo–Hawk, R.C.
2000 Ancient history in the New World: integrating oral traditions and the archaeological record in Deep Time. American Antiquity 65 (2): 267–290.

Eldridge, M.
1994 Stirling Creek Bridge Crossing, Similkameen. Permit #1994–142. Letter report on file, Archaeology Branch, Victoria.

Eldridge, M. and A. Mackie
1993 Predictive Modelling and the Existing Archaeological Inventory in British Columbia. Archaeology Task Group of Geology, Soils and Archaeology Task Force Resource Inventory Committee, Millennia Research, Sidney.

Elmendorf, W.
1965 Linguistic and geographic relations in the northern Plateau area. Southwestern Journal of Anthropology 21 (1):63–77.

Equinox Research and Consulting Ltd.
1996 An Evaluation of Archaeological Overviews and Reviews Conducted in British Columbia 1993–1996. Manuscript on file, Archaeology Branch, Victoria.

Ewonus, P.
1999 Subsistence Patterns from 7500 BP: Faunal Analysis of the Stirling Creek Bridge Site (DiRa–9), Similkameen Valley, South–central British Columbia. Unpublished BA (Honours) thesis, Simon Fraser University, Dept. Archaeology, Burnaby.

Fanning, M.L.
1985 Enloe Dam Passage Project Annual Report 1984: Volumes 1 and 2. U.S. Department of Energy Bonneville Power Administration Division of Fish and Wildlife, Portland and IEC Beak Consultants, Ltd., Richmond, B.C.

Fedje, D.
1996 Early human presence in Banff National Park. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dallan Bona (editors), UBC Press, Vancouver:35–44.

Fedje, D., J. White, M.Wilson, D. Nelson, J. Vogel and J. Southon
1995 Vermilion Lakes site: adaptations and environments in the Canadian Rockies during the latest Pleistocene and early Holocene. American Antiquity 60 (1): 81–108.

Fedje, D.W., A.P. Mackie, J.B. McSporran and B. Wilson
1996 Early Period Archaeology in Gwaii Haanas: Results of the 1993 Field Program. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver:133–150.

Fisher, R.
1992 Judging history: reflections on the reasons for judgment in Delgamuukw v. BC. BC Studies (Autumn):43–54.

Fladmark, K.R.
1970 A Preliminary Report on Lithic Assemblages from the Queen Charlotte Islands, British Columbia. In Proceedings of the 2nd Annual Palaeoenvironmental Workshops of the University of Calgary, R.A. Smith and J.W. Smith (editors), Student's Press, University of Calgary, Calgary:117–136.
1975 A Paleoecological Model for Northwest Prehistory. National Museums of Canada Archaeological Survey of Canada Mercury Series #43, Ottawa.
1976 Punchaw Village: A Preliminary Report; Archaeology of a Prehistoric Settlement. Simon Fraser University Current Research Report Publication No. 3, Burnaby.
1979a The Early Prehistory of the Queen Charlotte Islands. Archaeology 32 (2):38–45.
1979b Routes: alternative migration corridors for early man. American Antiquity 44 (1):55–69.
1982 An introduction to the prehistory of British Columbia, Canadian Journal of Archaeology 6:95–156.
1983 Times and Places: Environmental Correlates of Mid–to–Late Wisconsinan Human Population Expansion in North America. In Early Man in the New World, R. Shutler Jr. (editor), Sage Publications, Beverly Hills:13–42.
1985 Glass and Ice: The Archaeology of Mt. Edziza. Simon Fraser University Department of Archaeology Publication No. 14, Burnaby.
1986 B.C. Prehistory. National Museums of Man, Ottawa.
1989 Native history of the Queen Charlotte Islands. In The Outer Shores, G. Scudder and N. Gessler (editors), Queen Charlotte Islands Museum:199–222.
2001 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.
2005 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.

Fladmark, K.R., M.K. Rousseau and J. Breffitt
1988 A Preliminary Survey for Evidence of Early Human Occupations in the Southwestern Interior of British Columbia. Ms. on file with the Archaeology Branch, Victoria.

Flenniken, J.
1981 Replicative Systems Analysis: A Model Applied to Vein Quartz Artifacts from the Hoko River Site. Washington State University Laboratory of Anthropology Reports #59, Pullman.
1987 The Paleolithic Dyuktai pressure blade technology of Siberia. Arctic Anthropology 24 (2):117–132.

Florian, M.E.
1990 Guardian Spirit Pictograph (DhQ2–3) Keremeos Forks Reserve 12/12A, Pictograph Analysis. Manuscript on file, B.C. Archaeology and Outdoor Recreation Branch, Victoria.

Foit, N.
1999 Personal communication. University of Washington, Dept. of Geography Geological Laboratory, Seattle.

Freid, M.H.
1975 The Notion of Tribe. Cummings Publishing Co., Menlo Park.

Frison, G.C.
1991 The Goshen Paleoindian Complex: New Data for Paleoindian Research. In Clovis: Origins and Adaptations, R. Bonnichsen and K.L. Turnmire (editors), Center for the Study of the First Americans, Oregon State University, Corvallis:133–152.

Frison, G.C. and R. Bonnichsen
1996 The Pleistocene–Holocene Transition on the Plains and Rocky Mountains of North America. In Humans at the End of the Ice Age: the Archaeology of the Pleistocene–Holocene Transition, L.G. Straus, B.V. Eriksen, J.M. Erlandson and D.R. Yesner (editors), Plenum Press, New York:303–338.

Fulkerson, A.
1988 Predictive Locational Modeling of Aboriginal Sites in the Methow River Area: Deductive and Inductive Approaches. Unpublished MA thesis. Washington State University, Dept. of Anthropology, Seattle.

Galm, J.R., G.D. Hartmann, R. Masten and G. Stephenson
1981 A Cultural Resources Overview of the Bonneville Power Administration's Mid–Columbia Project, Central Washington. Bonneville Cultural Resources Group Report No. 100–16, Eastern Washington University, Reports in Archaeology and History, Cheney.

Galm, J.R., G.D. Harmann and R.A. Master
1985 An Archaeological Overview of the Mid–Columbia Study Unit, Benton, Franklin, Klickitat and Walla Walla Counties, Washington. Washington State Office of Historic Preservation, Olympia.

Gallison, J.D.
1994 Slab Camp: An Early to Middle Holocene Olcott Complex in the Eastern Olympic Mountains of Washington. Unpublished Ph.D dissertation, Washington State University, Dept. of Anthropology, Pullman.

Garbarino, M. and R. Sasso
1994 Native American Heritage (3rd edition). Waveland Press, Prospect Heights.

Gathercole, P. and D. Lowenthal
1990 The Politics of the Past. Unwin Hyman Publishing Co., London.

Gilsen, L.
1998 Personal communication. Oregon State Archaeologist (retired), Eugene.

Goddard, I. and L. Campbell
1994 The history and classification of American Indian languages: what are the implications for the peopling of the America? In Method and Theory for Investigating the Peopling of the Americas, R. Bonnichsen and D. Steele (editors), Oregon State University, Corvallis:190– 207.

Goebel, T.
2002 The "Microblade Adaptation" and recolonization of Siberia during the Late Upper Pleistocene. In Thinking Small: Global Perspectives on Microlithization, R.G. Elston and S.L. Kuhn (editors), Archaeological Papers of the American Anthropological Association #12:117–131.

Goodfellow, Rev. J.C.
1928 Fur and gold in the Similkameen. British Columbia Historical Quarterly 11 (2):7.

Gould, B.
2000 Personal communication: Upper Similkameen Indian Band Archaeology and Heritage Studies Resource Group, Keremeos.
2001a Upper Similkameen Indian Band Archaeology Overview/Inventory, Southeast Princeton. Project No. 712547–2575. Manuscript on file. Nicola–Similkameen Innovative Forestry Society and Upper Similkameen Indian Band, Keremeos.
2001b Personal communication: Upper Similkameen Indian Band Archaeology and Heritage Studies Resource Group, Keremeos.

Gould, B. and S. Copp
2000 Preliminary Field Reconnaissance: Proposed Skid Road Adjoining TSL A62339–02 and TSL A63345–05, Calcite Creek, Upper Similkameen Valley, B.C. Non–permit. Manuscript on file, Merritt District Small Business Forest Enterprise Program, Merritt.

Gould, B., S. Copp and C. Allison
2000 Archaeological Impact Assessment TSL A50512–04: Interim Report. Permit #2000–352. Manuscript on file, Archaeology Branch (Ministry of Sustainable Resources), Victoria.
2001 Copper Mountain Road Spring Site (DiRc–67) Archaeological Impact Assessment, Upper Similkameen Valley, B.C. Permit No. 2000–352. Manuscript on file, Archaeology Branch, Victoria.

Gould, B. and C. Allison
2001 Upper Similkameen Indian Band Archaeological Overview/Inventory Southeast Princeton: Final Report (Project No. 712547–2575). Manuscipt on file, Nicola–Similkameen Innovative Forestry Society, Merritt and Keremeos.

Gotthardt, R.
1990 The Archaeological Sequence in the Northern Cordillera: A Consideration of Typology and Traditions. Yukon Heritage Branch Occasional Papers in Archaeology No. 1, Whitehorse.

Gould, S and N. Eldredge
1977 Punctuated equilibria: the tempo and mode of evolution reconsidered. Paleobiology 3:115– 151.

Grabert, G.F.
1968 North–central Washington Prehistory. University of Washington Dept. of Anthropology Reports in Archaeology No. 1, Seattle.
1970 Prehistoric Cultural Stability in the Okanagan Valley of British Columbia. Unpublished PhD dissertation, Dept. Anthropology, University of Washington, Seattle.
1971 Some implications of settlement variations in the Okanagan region. In Aboriginal Man and Environments on the Plateau of Northwest America, A.H. Stryd and R.A. Smith (editors), The Students' Press, University of Calgary, Calgary: 153–167.
1974 Okanagan Archaeology: 1966–67, Syesis 7, Supplement 2, Victoria.
1979 Pebble tools and time factoring. Canadian Journal of Archaeology 3: 165–176.
1984 Prehistoric central Northwest Coast and Plateau Subsistence. In Western Washington Indian Socio–economics: Papers in Honor of Angelo Anastasio, H.C. Taylor and G. Grabert (editors), Western Washington University, Bellingham: 5–20.

Gramly, R.M.
1996 The East Wenatchee Clovis site (Ritchey–Roberts site): summary of findings and current status. Current Research in the Pleistocene 13: 19–21.

Greaves, S.
1991 The organization of microcore technology in the Canadian southern Interior Plateau. Unpublished Ph.D dissertation, University of British Columbia, Dept. Anthropology, Vancouver.
1998 Plateau Microblade Tradition. In Archaeology of Prehistoric Native America: An Encyclopedia, G. Gibbon (editor), Garland Publishing, Inc., New York: 661–662.
1999 The cutting edge: a new look at microcore technology. Northwest Anthropological Research Notes 33 (2): 191–217.

Green, A.J. and T.M. Lord
1974 Soils of the Tulameen Area of British Columbia. Report No. 13, British Columbia Soil Survey, ResearchBranch, Canada Dept. of Agriculture, Ottawa.
1979 Soils of the Princeton Area of British Columbia. Report No. 14, British Columbia Soil Survey, Research Branch, Agriculture Canada, Ottawa.

Greenberg, J.H., C.G. Turner and S.L. Zegura
1986 The settlement of the Americas: a comparison of the linguistic, dental and genetic evidence. Current Anthropology 27 (5):477–497.

Greenberg, J.H.
1987 Language in the Americas. Stanford University Press, Stanford.
1996 Beringia and New World Origins I: The Linguistic Evidence. In American Beginnings: The Prehistory and Paleoecology of Beringia, F.H. West (editor), University of Chicago Press, Chicago:525–536.

Greengo, R.E.
1986 Prehistory of the Priest Rapids–Wanapum Region, Columbia River, Washington Volumes 1 to 3. British Archaeological Reports International Series 290(i–iii), Oxford.

Greenough, J.D., L.M. Mallory–Greenough and J. Baker
2004 Orthopyroxene, augite and plagioclase compositions in dacites: application to bedrock sourcing of lithic artefacts in southern British Columbia. Canadian Journal of Earth Sciences 41 (6):711–723.

Greiser, S.T.
1988 Lost Terrace Avonlea material culture. In Avonlea Yesterday and Today: Archaeology and Prehistory, L.B. Davis (editor), Saskatchewan Archaeological Society, Saskatoon: 119–128.

Gruhn, R.
1988 Linguistic evidence in support of the coastal route of earliest entry into the New World. Man 23 (1):77–100.
1997 Language Classification and models of the Peopling of the Americas. In Archaeology and Linguistics: Aboriginal Australia in Global Perspective, P. McConvell and N. Evans (editors), Oxford University Press, Mellbourne: 99–110.

Hackenberger, S.
2000 Cultural Affiliation Study of the Kennewick Human Remains: Review of the Bio–Archaeological Information. Kennewick Man Cultural Affiliation Study Chapter 5. [http://www.cr.nps.gov/aad/Kennewick/index.htm].

Haley, S.
1996 The Pasika Complex Revisted. In Early Human Occupation in British Columbia, R. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 51–64.

Handly, M.
1997 Final Archaeological Impact Assessment Letter Report (Permit 1997–133): Tolko Industries Ltd. – Nicola Division, Tulameen Drainage, Merritt Forest District. Report on file with the Archaeology Branch.
1998 Final Archaeological Impact Assessment, Letter Report (Permit 1997– 155): Tolko Industries Ltd. – Nicola Division, Merritt Forest District. Report on file with the Archaeology Branch.

Handly, M. and R. Lackowicz
1998 Whipsaw Creek Archaeological Inventory Survey preliminary permit application. Manuscript on file, Upper Similkameen Indian Band, Keremeos.

Hanson, G. and J. Taylor
1975 Preliminary Report on the Study of the Natural Deterioration of Rock Paintings in the Similkameen Valley Area of British Columbia. Manuscript on file, Archaeological Sites Advisory Board of British Columbia, Victoria.

Hare, P.
1995 Holocene Occupations in the Southern Yukon: New Perspectives from the Annie Lake Site. Yukon Heritage Branch Occasional Papers in Archaeology No. 5, Whitehorse.

Harper, W.L.
1984 Pregnancy rate and early lamb survival of California Bighorn Sheep (Ovis canadensis californiana) in the Ashnola watershed, British Columbia. Unpublished M.Sc. Thesis, University of British Columbia, Dept. Biology, Vancouver.

Harrington, J.P.
1943 Pacific Coast Athapaskan discovered to be Chilcotin. Journal of the Washington Academy of Sciences 33 (7):203–213.

Harris, J.
1949 Indian pictographs of south–central British Columbia. 13th Annual Report of the Okanagan Historical Society, Vernon:22–23.

Harris, R.W.
1976 Blackeye's and 1849 HBCo trail. British Columbia Historical News 12 (1):15–16.

Hatfield, H.R.
1987b Blackeye's trail. Fifty–first Annual Report, Okanagan Historical Society: 99–104.

Hayashi, K.
1968 The Fukui microblade technology and its relationships in Northeast Asia and North America. Arctic Anthropology 5 (1): 128–190.

Hayden, B.
1990 Nimrods, piscators, pluckers and planters: the emergence of food production. Journal of Anthropological Archaeology 9: 31–69.
1992 Conclusions: ecology and complex hunter/gatherers. In A Complex Culture of the British Columbia Plateau: Traditional *Stl'atl'imx* Resource Use, B. Hayden (editor), UBC Press, Vancouver:525–563.
1997 Observation on the prehistoric social and economic structure of the North American Plateau. World Archaeology 29 (2):242–261.

Hayden, B., G. Reinhardt, R. MacDonald, D. Holmberg and D. Crellin
1996 Space per capita and the optimal size of housepits. In People Who Lived in Big Houses: Archaeological Perspectives on Large Domestic Structures, G. Coupland and E. Banning (editors), Prehistory Press, Madison: 151–164.

Hayden, B. and J. Spafford
1993 The Keatley Creek site and corporate group archaeology. BC Studies 99: 106–139.

Hebda, R.J.
1990 Global change and British Columbia native flora. B.C. native plants, their current status nd future colloquium, University of British Columbia Dept. Botany, Vancouver (12 May). [http://Victoria.tc.ca/environment/ biodiversity/hebda].
1995 British Columbia vegetation and climate history with focus on 6 KA B.P. Geographie Physique et Quaternaire 49 (1): 55–79.
1997 Impact of climatic change in biogeoclimatic zones of British Columbia and Yukon. In Responding to Global Climate Change in British Columbia and Yukon, Volume I of the Canada Country Study: Climate Impacts and Adpatation, E. Taylor and B. Taylor (editors), Environment Canada, Ottawa: 13.1 to 13.15.
1999 Environmental History. In Assessment of Species Diversity in the Montane Cordilleran Ecozone, I. Smith and G. Scudder (editors), Ecological Monitoring and Assessment Network, Burlington. http://www.cciw.ca/ eman–temp/reports/publicatons/99_montane/ environ/environ2.html]

Heinrichs, M.L.
1999 A Late Quaternary Paleoecological Analysis of the Engelmann Spruce–Subalpine Fir Biogeoclimatic Zone of the Okanagan/Ashnola Region, British Columbia. Unpublished Ph.D., Dept. Biological Science, University of Victoria, Victoria.

Heinrichs, M.L. and R.J. Hebda
2001 History and future of mid–high elevation steppe/grasslands in the southern interior of British Columbia. Royal British Columbia Museum, Victoria and Okanagan University College, Kelowna Living Landscapes webpage [http://royal.okanagan.bc.ca/newsletr/v5n2/v5n2p7.html]

Heinrichs, M.L., I.R. Walker, R.W. Mathews and R.J. Hebda
1999 Holocene Chironomid–inferred salinity and paleovegetation reconstruction from Kilpoola Lake, British Columbia. Geographie Physique et Quaternaire 53 (2):

Helmer, J.W.
1977 Points, people and prehistory: a preliminary synthesis of culture history in North Central British Columbia. In Problems in Prehistory of the North American Subarctic: The Athapaskan Question, Helmer, J.W., S. Van Dyke and F.J. Kense (editors), University of Calgary Archaeological Association, Calgary: 90–97.

Hess, S. C.
1997 Rocks, Range and Renfrew: using distance–decay effects to study late Pre–Mazama period obsidian acquisition and mobility in Oregon and Washington. Unpublished Ph.D. Dissertation, Washington State University, Dept. Anthropology, Seattle.

Hicks, B.A.
1997 Microblades and function: a study and comment. Archaeology in Washington 6:35–52.

Hill–Tout, C.
1900 Notes on the N'tlaka'pamuQ of British Columbia, a Branch of the Great Salish Stock of North America. 69th Annual Report of the British Association for the Advancement of Science for 1899, London:500–584 (reprinted in R. Maud (editor) The Salish People, Volume 1: The Thompson and the Okanagan, Talonbooks, Vancouver:41–129 [1978])
1911 Report on the Ethnology of the Okanak'en of Britrish Columbia, an Interior Division of the Salish Stock. Journal of the Royal Anthropological Institute of Great Britain and Ireland 41:130,137–144. (Reprinted in R. Maud (editor) The Salish People, Volume 1: The Thompson and the Okanagan, Talonbooks, Vancouver:131–159 [1978]).

Hills, L.V.
1962 Glaciation, Stratigraphy, Structure and Micropaleobotany of the Princeton Coal Field, British Columbia. Unpublished MA thesis, University of British Columbia, Department of Geology, Vancouver.

Hodder, I.
1982a Symbols in Action. Cambridge University Press, Cambridge.
1982b (editor) Symbolic and Structural Archaeology. Cambridge University Press, Cambridge
1989 The Meaning of Things: Material Culture and Symbolic Expression. Unwin Hyman, London.
1991 Interpretive archaeology and its role. American Antiquity 56 (1): 7–18.

Hoffecker, J.F.
1996 Moose Creek. In American Beginnings: The Prehistory and Paleoecology of Beringia, F.H. West (editor), University of Chicago Press, Chicago:363–365.

Hoijer, H.
1956 The chronology of the Athapaskan languages. International Journal of American Linguistics 22 (4):219–232.

Holmes, R.
2000 Personal Communication. Chief, Upper Similkameen Indian Band, Keremeos.

Hood, D.
2003 Personal communication. Letter dated 14 October 2003 re: radiometric sample (DhQx–10). Beta Analytic Inc., Miami.

Hudson, D.
1986 The Okanagan Indians. In Native Peoples: The Canadian Experience, B. Morrison and C. Wilson (editors), McClelland & Stewart, Toronto.
1990 The Okanagan Indians of British Columbia. In Okanagan Sources, J. Webber (editor), Theytus Books, Penticton: 53–89.
1994 Upper Similkameen Ethnographic and Ethnohistorical Overview, Paper presented at the
1994 B.C. Studies Conference, Okanagan University College, Kelowna.
1995 The Okanagan Indians. In Native Peoples: The Canadian Experience (2nd edition), B. Morrison and C. Wilson (editors), McClelland and Stewart, Toronto.
1996 Indigenous Use and Occupancy in the area of the Hudson's Bay Brigade Trail (Tulameen Area): A Preliminary Report. Manuscript on file, Merritt Forest District and Upper Similkameen Indian Band, Merritt and Keremeos. File 15550–30/95–10.

2000 Personal communication: University College of the Fraser Valley, Abbotsford.

Hunn, E.S.
2000 Review of Linguistic Information. Kennewick Man Cultural Affiliation Report Chapter 4, Section 1. [http://www.cr.nps.gov/aad/Kennewick/ index.htm].

Hutchings, W.K.
1996 The Namu obsidian industry. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 167–176.

Hymes, D.H.
1957 A note on Athapaskan glottochronology. International Journal of American Linguistics 23: 291–297.

Irwin, H.T.
1968 The Itama: Late Pleistocene Inhabitants of the Plains of the United States and Canada and the American Southwest. Unpublished Ph.D dissertation, Harvard University, Cambridge.

Ives, J.
1990 A Theory of Northern Athapaskan Prehistory. University of Calgary Press, Calgary.

Jaehnig, M.
1985 Archaeological Investigations at Site 45–OK–258, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.
2000 Establishing cultural continuity between Kennewick man and modern Columbia Plateau Tribes. Confederated Tribes of the Umatilla Indian Reservation, Cultural Resources Protection Program, Pendleton, Oregon. Report submitted to the National Parks Services, Department of the Interior, Washington, D.C. (cited in Babbitt 2000).

Jochim, M.A.
1976 Hunter–Gatherer Subsistence and Settlement: A Predictive Model. Academic Press, New York.

Johnson, R.
1994 Report on a General Fish Inventory of Streams in the South Okanagan and Similkameen Watersheds, 1994. Report prepared for First Nations Okanagan–Similkameen Environmental Protection Society and Fisheries Branch, British Columbia Ministry of Environment, Lands and Parks.

Jones, P.N.
2003 Old world infectious diseases in the Plateau area of North America during the Protohistoric: rethinking our understanding of the ‘contact’ in the Plateau. Journal of Northwest Anthropology 37 (1):1–26.

Jones, S.
1997 The Archaeology of Ethnicity: Constructing Identities in the Past and Present. Routledge, London.

Keddie, G.
2003 The Atlatl Weapon. Royal British Columbia Museum Human History Collections, Research Papers and Special Projects, Victoria. [http://royalbcmuseum.bc.ca/history/atlatl/atlatl.html].

Kehoe, A.B.
2002 America Before the European Invasions. Longman Publishing Company, New York.

Kelly, M.K.
1982 A Technical Analysis of a Microblade Industry from Southwestern Washington. Paper presented at the 35th Northwest Anthropological Conference, Burnaby.
1984 Microblade technology and variability in the Chehalis River Region, southwest Washington. Unpublished MA thesis, Dept. Anthropology, Washington State University, Pullman.

Kelly, R.L.
1988 The three sides of a biface. American Antiquity 53 (4): 717–734.
The Forging Spectrum: Diversity in Hunter–Gather Lifeways. Smithsonian Institution Press, Washington.

Kelley, C. and R. Spillsbury
1955 Soil Survey of the Okanagan and Similkameen Valleys, British Columbia. Report No. 3 of B.C. Surveys, B.C. Dept. of Agriculture, Victoria.

Kennedy, B
1977 Initial attempts at conservation work at rock art sites in British Columbia. In CRARA '77: Papers from the Fourth Biennial Conference of the Canadian Rock Art Research Associates, D. Lundy (editor), Heritage Record 8, Ministry of the Provincial Secretary and Government Services, Victoria:285–292.

Kennedy, D. and R. Bouchard
1985 Salish, Interior. The Canadian Encyclopedia, Volume III. Hurtig, Edmonton: 1631.
1986 Indian History and Knowledge of the Aspen Grove to Peachland Corridor of the Coquihalla Highway. Coquihalla Highway Project Merritt to Peachland, B.C.:121–135. Manusript on file, Heritage Conservation Branch, (Archaeology Branch), Victoria.
1998 Northern Okanagan, Lakes and Colville. In Handbook of North American Indians Vol. 12: Plateau, D.E. Walker (editor), Smithsonian Institution, Washington, D.C.:238– 252.

Kennedy and Oda
1988 Lithic Analysis. In Naches Lithic Scatter CR05–07–31 Data Recovery Report, A.R. Onat (editor), BOAS Inc., Seattle: 54–93.

Kershaw, A.
1978 The Quaternary history of the Okanagan. Okanagan Historical Society 42nd Annual Report, Vernon.

Keyser, J.
1992 Indian Rock Art of the Columbia Plateau. Douglas and McIntyre, Vancouver.

Kidd, R.S.
1964 A Synthesis of Western Washington Prehistory from the Perspective of Three Occupational Sites. Unpublished MA thesis, University of Washington, Dept. Anthropology, Seattle.

Kinkade, M.D.
1967 On the identification of the Methows (Salish). International Journal of American Linguistics 33:193–197.
1991 Prehistory of the Native Languages of the Northwest Coast. Proceedings of the Great Ocean Conferences Volume 1: The North Pacific to 1600. Oregon Historical Society Press, Portland:137–158.

Kinkade, M.D., W. Elmendorf, B. Rigsby and H. Aoki
1998 Languages. In Handbook of North American Indians Vol. 12: Plateau, D.E. Walker (editor), Smithsonian Institution, Washington, D.C.:49–72.

Kirk, J.
1972 Notes on the early history of the Nicola Valley by James E. Teit. Transcription of manuscript "copied by Harrington in Aug & Sept 1941 [original manuscript held by Mr. Sigurd Teit of Vancouver]". Manuscript on file, Itkus Heritage Consulting, Vancouver.

Kobayashi, T.
1970 Microblade industries of the Japanese archipelago. Arctic Anthropology 7 (2):38–58.

Kohl, P.L.
1998 Nationalism and Archaeology: on the constructions of nations and the reconstructions of the remote past. Annual Review of Anthropology 27: 223_246.

Kohler, T.A. and S.C. Park
1986 Predictive models for archaeological resource location. In Advances in Archaeological Method and Theory: Volume 9, M. Schiffer (editor), Academic Press, New York:397–452.

Krajina, V.
1969 Ecology of Forest Trees in British Columbia. Ecology of Western North America 2: 1–145.

Krauss, M.E.
1973 Na–Dene. In Current Trends in Linguistics Vol.10, Mouton, T.A. Sebeok (editor), The Hague: 903–978.
1979 Na–Dene and Eskimo–Aleut. In The Languages of Native America: Historical and Comparative Assessment, L. Campbell and M. Mithun (editors), University of Texas Press, Austin:803–901.

Krauss, M.E. and V.K. Golla
1981 Northern Athapaskan languages. In Handbook of North American Indians Volume 6: Subarctic, J. Helm (editor), Smithsonian Institution, Washington DC:67–85.

Kroeber, A.L.
1939 Cultural and Natural Areas of Native North America. University of California Publications in American Archaeology and Ethnology, Volume XXXVIII, University of California Press, Berkeley.

Kuijt, I.
1989 Subsistence resource variability and culture change during the Middle–Late prehistoric cultural transition on the Canadian Plateau. Canadian journal of Archaeology 13 (1):97–118.

Kvamme, K.L.
1985 Determining empirical relationships between the natural environment and prehistoric site locations: a hunter–gatherer example. In For Concordance in Archaeological Analysis: Bridging Data Structure, Quantitative Technique and Theory, C. Carr (editor), Westport Press, Kansas City:208–238.

Lawhead, S., A. Stryd and J. Curtin
1986 Excavations at Valley Mine, Highland Valley, B.C. Volumes 1 and 2. Manuscript on file, British Columbia Heritage Conservation Branch, Victoria.

Lawson, B. and R. Johnson
1982 Mountain Sheep. In Wild Mammals of North America: Biology, Management and Economics, J.A. Chapman and G.A. Feldhammer (editors), Johns Hopkins University Press, Baltimore:1036–1055.

LeBlanc, R. and J.W. Ives
1986 The Bezya site: a wedge–shaped core assemblage from Northeastern Alberta. Canadian Journal of Archaeology 10: 59–98.

Lee, R.B.
1984 The Dobe !Kung. Holt, Rinehart and Winston, New York.

Leonhardy, F. and D. Rice
1970 A proposed culture typology for the lower Snake River region, southeastern Washington. Northwest Anthropological Research Notes 4 (1):1–29.

Lerman, N.H.
1954 An Okanagan Winter Dance, Anthropology in British Columbia No. 4: 35–36.

Leroi–Gourhan, A.
1968 The Art of Prehistoric Man in Western Europe. Thames and Hudson, London.

Lewis–Williams, D.
2002 The Mind in the Cave. Thames and Hudson, New York.

Lohse, E.S.
1984a Archaeological Investigations at Site 45–DO–11, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.
1984b Archaeological Investigations at Site 45–DO–204, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.

1984c Archaeological Investigations at Site 45–DO–211, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.
1984d Archaeological Investigations at Site 45–DO–242/243, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.
1984e Archaeological Investigations at Site 45–DO–282, Chief Joseph Dam Project. Office of Public Archaeology, University of Washington, Seattle.
1985 Rufus Woods Lake projectile point chronology. In Summary of Results, Chief Joseph Dam Cultural Resources Project, Washington, S. Campbell (editor), Office of Public Archaeology, Institute for Environmental Studies, University of Washington, Seattle: 317–364.
1995 Northern Intermountain West projectile point chronologies. Tebiwa 25 (l):3–51.

Lohse, E.S. and R. Sprague
1998 History of Research. In Handbook of North American Indians: Volume 12: Plateau, D.E. Walker (editor), Smithsonian Institution, Washington: 8–28.

Longacre, W.A.
1970a Archaeology as Anthropology: A Case Study. University of Arizona Press, Tuscon.
1970b A Historical Review. In Reconstructing Prehistoric Pueblo Societies, W.A. Longacre (editor), University of New Mexico Press, Albuquerque.
1991 Ceramic Ethnoarchaeology. University of Arizona Press, Tuscon.

Losey, T.C.
1978 The Prehistoric Cultural Ecology of the Western Prairie–Forest Transition Zone, Alberta. Unpublished Ph.D dissertation, University of Alberta, Dept. of Anthropology, Edmonton.

Louie, C.
2000 Strong economy may cure social woes. Oliver Chronicle 64 (15):4. (edited text of speech given by Chief Louie, Osoyoos Indian Band, prior to being named Canada's Economic Developer of the Year).

Lowe, C., T. Brimah, P–A. Marsh, W. Minter and M. Myyangwa
1997 Talking about "tribe": moving from stereotypes to analysis. African Policy Information Center, Washington, DC. [http://www.africaaction. org/bp/ethall.htm].

Loy, T., R. Jones, D. Nelson, B. Meehan, J. Vogel, J. Southon and R. Cosgrove.
1990 Accelerator radiocarbon dating of human blood proteins in pigment from late Pleistocene sites in Australia. Antiquity 64 (242):110–116.

Lu, T.L.
1998 The Microblade Tradition in China: regional chronologies and significance in the transition to Neolithic. Asian Perspectives 37 (1):85–112.

Ludowicz, D.
1983 Assemblage variation associated with southwestern Interior Plateau microblade assemblages. Unpublished MA thesis, University of British Columbia, Dept. of Sociology and Anthropology, Vancouver.

Lyman, R., M. O'Brien and R. Dunnell
1997 The Rise and Fall of Culture History. Plenum Press, New York.

MacKay, J.
1895 Postcard to J.A. Teit in Boas Collection, American Philosophical Society, Philadelphia (cited in Wyatt 1972)

Mackie, A.
1987 Experimental microblade replication project conducted at the University of British Columbia for Professor D. Pokotylo re: S. Greave's PhD dissertation. Cited in S. Greaves (1991) The Organization of Microcore Technology in the Canadian Southern Interior Plateau. Unpublished PhD dissertation, Dept. of Anthropology and Sociology, University of British Columbia, Vancouver: 186–190.

MacNeish, R.S.
1964 Investigations in Southwest Yukon: Archaeological Excavations, Comparisons and Speculations. Papers of the R.S. Peabody Foundation for Archaeology 6 (2):201–488.

Magne, M.P.
1996 Comparative analysis of microblade cores from Haida Gwaii. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 151–158.
2000 Personal communication: Parks Canada (Western Region), Archaeology Head, Calgary.
2001 Plateau and Plains Athapaskan movements in late prehistoric and early historic times: a view from the middle. Unpublished manuscript, Parks Canada (Western Region), Archaeology Head, Calgary.
2003 Personal communication: Parks Canada (Western Region), Archaeology Head, Calgary.
2004 Personal communication: Parks Canada (Western Region), Archaeology Head, Calgary.

Magne, M.P. and D. Fedje
2003 Evidence of relationships between microblades and Athapaskans. Paper read at the Blade and Micoroblade Industries in Asia and America conference, Vladivostok, Russia. Manuscript on file, Itkus Heritage Consulting, Port Moody.

Magne, M.P. and R.G. Matson
1984 Athapaskan and earlier archaeology at Big Eagle Lake, B.C. Report to the Social Sciences and Humanities Research Council, University of British Columbia, Vancouver.
1987 Projectile point and lithic assemblage ethnicity in Interior British Columbia. In Ethnicity and Culture, R. Auger, M. Glass, S. MacEachern and P. McCarthy (editors), University of Calgary Press, Calgary: 227–242.

Mallery, G.
1893 Picture Writing of the American Indians. Annual Report (1888–1889) of the Bureau of Ethnology, Smithsonian Institution, Washington DC.

Mandryk, C.A.S., H. Josenhans, D. Fedje and R. Matthewes
2001 Late Quaternary palaeoenvironments of Northwestern North America: implications for inland versus coastal migration routes. Quaternary Science Reviews 20: 301–314.

Matson, R.G.
1976 (editor) The Glenrose Cannery Site. National Museum of Man Mercury Series No. 52, Ottawa.

1996 The Old Cordilleran Component at the Glenrose Cannery Site. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver:111–122.

Matson, R.G. and G. Coupland
1995 The Prehistory of the Northwest Coast. Academic Press, New York.

Mattini, A.
1987 Colville–Okanogan Dictionary. Occasional Papers in Linguistics No. 5, University of Montana, Missoula.

Matz, S.E.
1991 The Mazama Tephra–falls: Volcanic Hazards and Prehistoric Populations. Unpublished Ph.D dissertation, Oregon State University, Dept. Anthropology, Corvallis.

Maude, R.
1978 Introduction. In The Salish People: The Local Contribution of Charles Hill–Tout Volume I: The Thompson and the Okanagan. R. Maude (editor), Talonbooks, Vancouver:11–19.

McEachern, A.E. (Chief Justice B.C. Supreme Court)
1997 Delgamuukw v. BC. [http://www.lexum.umontreal.ca/csc–scc/ en/ pub/ 1997/vol3/html/1997scr3_1010.html].

Medvedev, G.I., N.A. Savel'ev and V.V. Svinin
1990 Stratigraphiia, paleogeographiia, i arckheologiia iuga srednei Sibiri: K XIII Kongressu INQUA 1990. Nauka, Irkutsk.(Cited in Goebel et al 2000: 567–575).

Mehringer, P.J., Jr. and Foit, F.F.
1990 Volcanic Ash Dating of the Clovis Cache at East Wenatchee, Washington. National Geographic Research 6:495–503.

Meidinger, D. and J. Pojar
1991 Ecosystems of British Columbia. B.C. Ministry of Forests Research Branch, Victoria.

Menzer, M.J.
2000 The great vowel shift. Dept. English, Furman University, Greenville, S.C. [http://facweb.forum.edu/~mmenzer/gvs/index.htm].

Meskell, L.
2002 The intersections of identity and politics in Archaeology. Annual Review of Anthropology 31: 279–301.

Mierendorf, R.
1993 Chert Procurement in the Upper Skagit River Valley of the northern Cascade Range, Ross Lake National Recreation Area, Washington. North Cascades National Park Service Complex, U.S. Department of Interior Technical Report NPS/PNRNOCA/CRTR–93–001, Sedro Woolley.

Mierendorf, R., T. Eller, D. Carlevato and P. McLeod
1981 A Cultural Resources Predictive Land Use Model for the Okanogan Highlands. Bonneville Cultural Resources Group Report No. 100–2, Eastern Washington University Reports in Archaeology and History, Cheney.

Mierendorf, R., D. Harry and G. Sullivan
1998 An Archaeological Site Survey and Evaluation in the Upper Skagit River Valley, Whatcom County, Washington. North Cascades National Park Service Complex, U.S. Department of Interior Technical Report NPS/PNRNOCA/CRTR–98/01, Sedro Woolley.

Mierendorf, R., F.F. Foit, Jr., and M. Nill
2006 Earth, Wind, Fire and Stone at Cascade Pass: Preliminary Archeology and Geochronology. Paper presented at the 59th Annual Northwest Anthropological Conference, Seattle.

Miller, J.
1998 Middle Columbia River Salishans. In Handbook of North American Indians Volume 12: Plateau, D.E. Walker Jr. (editor), Smithsonian Institution, Washington DC:253–270.

Miss, C.J.
1984 Archaeological Investigations at Site 45–OK–287/288, Chief Joseph Dam Project, Washington. Office of Public Archaeology, Seattle.

Mitchell, D.H.
1968 Microblades: a long–standing Gulf of Georgia tradition. American Antiquity 33:11–15.
1970 Archaeological investigations on the Chilcotin plateau. Syesis 3: 45–66.
1971 Excavations on the Chilcotin plateau: three sites, three phases. Northwest Anthropological Research Notes 4: 99–116.
1990 Prehistory of the coasts of southern British Columbia and northern Washington. In Handbook of North American Indians Volume 7: Northwest Coast, W. Suttles (editor), Smithsonian Institution, Washington, DC: 340–358.

Mitchell, D. and D. Pokotylo
1996 Early Period components at the Milliken site. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 65–82.

Mitchell, S.
1980 The Fish Passage Issue at Enloe Dam: An Assessment. State of Washington, Dept. of Ecology, State Water Program. Manuscript on file, University of Washington library, Seattle and Itkus Heritage Consulting, Port Moody.

Mobley, C.M.
1991 The Campus Site: A Prehistoric Camp at Fairbanks, Alaska. University of Alaska Press, Fairbanks.

Mohs, G.
1981 An Assessment and Evaluation of Heritage Resources in the South Thompson Valley of British Columbia. Occasional Papers of the Heritage Conservation Branch No. 8, Victoria.

Morgan, V. (editor)
1999 The SR–101 Sequim Bypass Archaeological Project: Mid– to Late–Holocene Occupations on the Northern Olympic Peninsula, Clallam County, Washington: Volumes 1 and 2. Eastern Washington University Reports in Archaeology and History 100–108, Archaeological and Historical Services, Cheney.

Morlan, R.
1970 Wedge–shaped core technology in northern North America. Arctic Anthropologist 7 (2):17–37.
1973 The Later Prehistory of the Middle Porcupine Drainage, Northern Yukon Territory. National Museum of Man Mercury Series Archaeological Survey Paper No. 11, Ottawa.

Mourning Dove (Humishuma; Christine Quintasket)
1933 Coyote Stories. The Caxton Printers, Ltd., Caldwell.
1990 Coyote Stories. University of Nebraska Press, Lincoln.

Muir, R. and M. Rousseau
1992 An Archaeological Impact Assessment for the Proposed Similkameen River Hydroelectric Project, Near Princeton, South–central British Columbia. Permit 1992–103. Manuscript on file. Archaeology Branch, Victoria.

Munsell, D.
1968 The Ryegrass Coulee Site. Unpublished MA thesis. Washington State University, Dept. of Anthropology, Seattle.

NASA Johnson Space Center
2002 Satellite Photo STS 639–96–64. [eol.jsc.nasa.gov].

Nasmith, H.
1962 Late Glacial History and Surficial Deposits of the Okanagan Valley, British Columbia. B.C. Dept. of Mines and Petroleum Resources Bulletin No. 46, Victoria.

Nelson, C.M.
1969 The Sunset Creek site (45–KT–28) and its place in Plateau Prehistory. Washington State University Laboratory of Anthropology Report of Investigations 46, Pullman.

Nelson, E.
1992 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.

Nesbitt, P.E.
1968 Stylistic Locales and Ethographic Groups: Petroglyphs of the Lower Snake River. Occasional Papers of the Idaho State University Museum No. 23, Pocatello.

Newman, T.
1966 Cascadia Cave. Occasional Papers of the Idaho State Museum No. 8, Pocatello.

Nicholas, G.
1998 Personal communication. Dept. Anthropology, University College of the Cariboo, Kamloops.
1999 EeRb–140. [http://www2.sfu.ca/archaeology/dept/fac_bio/nicholas/ pastfs.html].

2006 Personal communication. Dept. Archaeology, Simon Fraser University, Burnaby.

Nickman, R. and E. Leopold
1985 A postglacial pollen record from Goose Lake, Okanogan County, Washington: evidence for an early Holocene cooling. In Summary of Results, Chief Joseph Dam Cultural Resources Project, Washington, S. Campbell (editor), Office of Public Archaeology, Institute for Environmental Studies, University of Washington, Seattle: 131–147.

Okanagan Historical Society
1948 Twelfth (12th) Annual Report of the Okanagan Historical Society. Wayside Press, Vernon.

Okanagan Nation Alliance
2006 Okanagan Nation Alliance – Governance – Declaration – OKANAGAN NATION DECLARATION. [http://www.syilx.org/governance/Okanagannationneclaration.php].

Onat, A.R., M.E. Morgenstein, P.D. LeTourneau, R.P. Stone, J. Kosta and P. Johnson
2001a Archaeological Investigations at *stuwe'yuq*[w] – Site 45KI464 Tolt River, King County, Washington: Volume 1. Boas Inc., Seattle.
2001b Archaeological Investigations at *stuwe'yuq*[w] – Site 45KI464 Tolt River, King County, Washington: Volume 2. Boas Inc., Seattle.

Orloval, L.A. and Y.V. Kuzmin
1998 Radiocarbon chronology of the Siberian Paleolithic: a synthesis. Journal of World Prehistory 12 (1):1–44.

Ormsby, M.
1991 Introduction. A Pioneer Gentlewoman in British Columbia: the Recollections of Susan Allison. UBC Press, Vancouver:ix–li.

Ortner, C.
2006 Nicola–Similkameen Innovative Forestry Society Annual Report for conditions arising from the July 13, 2005 AAC Determination Conditions. Ministry of Forestry and Range, Kamloops.
[http://72.14.203.104/search?q=cache:–T9rqI0embgJ :login.nsifs.bc.ca/login.cgi%3FCGISESSID%3DSINGLEDOWNLOAD%26section%3DdownloadFile%26groupid%3D91%26documentid%3D883+Nicola–Similkameen+Innovative+July+13&hl= en&ct=clnk&cd=1]

O'Rourke, D, B. Suarez and J. Crouse
1985 Genetic variation in North Amerindian populations: convergence with climate. American Journal of Physical Anthropology 67 (3):241–250.

Osborne, D.D.
1957 Excavations in the McNary Reservoir Basin near Umatilla, Oregon. Bureau of American Ethnology Bulletin 166, River Basin Surveys Paper 8, Washington DC.

1959 Archaeological Tests in the Lower Grand Coulee, Washington. Washington State University Laboratory of Anthropology Report of Investigations 5, Pullman.
1967 Archaeological Tests in the Lower Grand Coulee, Washington. Occasional Papers of the Idaho State Museum No. 20, Pocatello.

Pacific West Coal (UK) Ltd.
1998 Pacific West Coal (UK) Ltd. Terms of Reference for Itkus Heritage Consulting, Archaeological Impact Assessment, Tulameen Coal Project, Tulameen, B.C. Manuscript on file, Itkus Heritage Consulting, Port Moody.

Palmer, H.S.
1860 Report of a Journey made by Lieutenant Palmer, R.E., from Fort Hope to Fort Colville in September 1859. Dated November 23, 1859. Papers Relating to British Columbia, Vol. III, 1860:79–89. London.

Parish, R., R. Coupe and D. Lloyd
1996 Plants of the Southern Interior British Columbia and Inland Northwest. Lone Pine Publishing, Vancouver.

Paterson, T.
1981 Encyclopedia of Ghost Towns and Mining Camps of British Columbia, Volume 2. Sunfire Books, Langley.

Peacock, S.
1988 An analysis of the Similkameen Valley pictograph sites, Dept. Archaeology, University of Calgary, Calgary. Manuscript on file with Environment Canada – Parks, Western Region, Archaeological Research Services, Calgary.
1998 Putting down roots: the emergence of wild plant food production in the Canadian Plateau. Unpublished Ph.D dissertation, University of Victoria, Dept. of Geography, Victoria.

Pellatt, M.
1996 Post–glacial Changes in Vegetation and Climate Near Treeline in British Columbia. Unpublished Ph.D dissertation, Simon Fraser University, School of Biological Sciences, Burnaby.

Pendergast, J.F.
1981 The Glenbrook Village Site: A Late St. Lawrence Iroquoian Component in Glengarry County, Ontario. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 100, Ottawa.

Pettigrew, R.
1978 A microblade tradition on the Coquille River, Southwestern Oregon. Paper presented at the 31st Annual Northwest Anthropological Conference, Pullman.
1980 Archaeological Investigations at the Looney Site (35DO13), Douglas County, Oregon. University of Oregon Anthropological Papers No. 18, Eugene.
1981 A Prehistoric Culture Sequence in the Portland Basin of the Lower Columbia Valley. University of Oregon Anthropological Papers No. 22, Eugene.
1990 New Pathways for Research in Southwest Oregon Archaeology. In Living With the Land: The Indians of Southwest Oregon, N. Hanon and R. Olmo (editors), Southern Oregon Historical Society, Medford:63–69.

Pettigrew, R. and C. Hodges
1985 Prehistoric hunter–gatherer land–use systems: Pacific Northwest. In Synthesis of Findings: Archaeological investigations PGT–G&E Expansion Project, Idaho, Washinton, Oregon and California: Volume IV, M. Moratto (editor), INFOTEC Research Inc., Fresno.

Pettigrew, R. and C. Lebow
1987 Data Recovery at Sites 35JA27, 35JA59, and 35JA100, Elk Creek Lake Project, Jackson County, Oregon. Manuscript on file, US Army Corps of Engineers, Portland and Itkus Heritage Consulting, Port Moody.

Plog, F.
1974 The Study of Prehistoric Change. Academic Press, New York.

Pokotylo, D.
1978 Lithic Technology and Settlement patterns in the Upper Hat Creek Valley, B.C. Unpublished Ph.D dissertation, University of British Columbia, Dept. Anthropology, Vancouver.

Pokotylo, D. and D. Mitchell
1998 Prehistory of the Northern Plateau. In Handbook of North American Indians Vol. 12: Plateau, D.E. Walker, Jr. (editor), Smithsonian Institution, Washington: 81–102.

Post, R.H.
1938 The subsistence quest. In The Sinkaietk or Southern Okanagon of Washington. General Series in Anthropology No. 6, Contributions from the Laboratory of Anthropology 2. W. Cline, R. Commons, M. Mandelbaum, R. Post and L. Walters (editors), George Banta Publishing Company, Menasha: 9–34.

Powell, J.W.
1891 Indian Linguistic Families of America north of Mexico. 7th Annual Report of the Bureau of American Ethnology for 1885–1886, Washington DC:1–142. (Reprinted in Handbook of American Indian Languages, P. Holder (editor), University of Nebraska Press, Lincoln[1966]).

Praeger, G., S. Copp and J. Bussey
2004 Archaeological Investigations: B.C. Gas Inland Pacific Connector Project, Kilometer 0 to 120. Permit No. 2002–261. Manuscript on file. Archaeological Planning and Assessment, Ministry of Sustainable Resource Management, Victoria.

Prentiss, W.C. and I. Kuijt
2004 Introduction: The Archaeology of the Plateau Region of Northwestern North America – Approaches to the Evolution of Complex Hunter–Gatherers. In Complex Hunter–Gatherers: Evolution and Organization of Prehistoric Communities on the Plateau of Northwestern North America, W. Prentiss and I. Kuijt (editors), The University of Utah Press, Salt Lake City:vii–xvii.

Price, T.D.
2000 Tracing the imigrants' trail. Scientific American Discovering Archaeology 2 (1):26–31.

Pyszczyk, H.
1991 A wedge–shaped microblade core, Fort Vermilion, Alberta. In Archaeology in Alberta 1988 and 1989: Archaeological Survey, Provincial Museum of Alberta Occasional Paper No. 33, M. Magne (editor), Edmonton: 199–203.

Ray, G.E. and G.L. Dawson
1987 The Geology and Controls of Skarn Mineralization in the Hedley Gold Camp of Southern British Columbia. British Columbia Ministry of Energy, Mines and Petroleum Resources Geological Fieldwork 1986 Paper 1987–1, Victoria.

Ray, V.F.
1932 The Sanpoil and Nespelem: Salishan Peoples of northeastern Washington. University of Washington Publications in Anthropology 5: 1–237.
1936 Native villages and groupings of the Columbia Basin, Pacific Northwest Quarterly 27: 99–152.
1939 Cultural Relations in the Plateau of Northwestern America. Publications of the Frederick Webb Hodge Anniversary Publication Fund, Volume III, Los Angeles.

Reid, K.C.
1991 Prehistory and Paleoenvironments at Pittsburg Landing: Data Recovery and Test Excavations at Six Sites in Hells Canon National Recreation Area, West Central Idaho. Washington State University Center for Northwest Anthropology Project Report No. 15, Pullman.

Reimer, R.
2000 Extreme Archaeology: the Results of Investigations at High Altitudes in the Northwest. Unpublished MA thesis, Simon Fraser University, Dept. Archaeology, Burnaby.

Rice, D.
1965 The cultural sequence at Windust Caves. Unpublished MA thesis, Washington State University, Pullman.
1968 Archaeological Investigations in the Coulee Dam Recreation Area, Spring 1968. Washington State University Laboratory of Anthropology Report of Investigations No. 45, Pullman.
1972 The Windust Phase in Lower Snake River Region Prehistory. Washington State University Laboratory of Anthropology Report of Investigations No. 50, Pullman.

Richards, M.P. and R.E.M. Hedges
1999 Stable isotope evidence for similarities in the types of marine foods used by Late Mesolithic humans at sites along the Atlantic coast of Europe. Journal of Archaeological Science 26:717–722.

Richards, M.P., T.I. Molleson, J.C. Vogel and R.E.M. Hedges
1998 Stable isotope analysis reveals variations in human diet at the Poundbury Camp cemetery site. Journal of Archaeological Science 25:1247–1252.

Richards, T. and M. Rousseau
1987 Late Prehistoric Cultural Horizons on the Canadian Plateau. Dept. of Archaeology, Simon Fraser University Publication No. 16, Burnaby.

Riddington, R.
1992 Fieldwork in Courtroom 53: a witness to Delgamuukw v. BC. BC Studies (Autumn):12–24.

Rigsby, B.J.
1964 Linguistic relations in the Southern Plateau. Unpublished Ph.D dissertation, University of Oregon, Dept. Anthropology, Eugene.
1996 Some aspects of Plateau linguistic prehistory: Sahaptian/Interior Salish relations. In Chin Hills to Chioquin: Papers Honoring the Versatile Career of Theodore Stern, D.E. Crabtree (editor), University of Oregon Anthropological Papers No. 52, Eugene.

Robertson, L.
1998 Personal Communication. Ministry of Forests (Merritt District), Recreation Camp resource officer, Merritt.

Robbins, C., B. Bruun and H. Zim
1966 Birds of North America. Golden Press, New York.

Robinson, H. and W. Wickwire (compiler)
1989 Write it on Your Heart. The Epic World of an Okanagan Storyteller. Talonbooks/Theytus Publishing, Vancouver.
1992 Nature Power: In the Spirit of an Okanagan Storyteller. Douglas & McIntyre, Vancouver.

Rogers, R.A., L. Martin and T.D. Nicklas
1990 Ice–age geography and the distribution of Native North American languages. Journal of Biogeography 17:131–143.

Roll, T. and S. Hackenberger
1998 Prehistory of the Eastern Plateau. In Handbook of North American Indians Volume 12: Plateau, D.E. Walker, Jr. (editor), Smithsonian Institution, Washington DC:120–137.

Rogers, R.A.
1985 Glacial geography and native North American languages. Quaternary Research 23 (1): 130–137.

Ross, M.
2001 Emerging trends in rock–art research: hunter–gatherer culture, land and landscape. Antiquity 75 (289): 543–548.

Rouse, I.
1972 Introduction to Prehistory: A Systematic Approach. McGraw–Hill, New York.

Rousseau, M.
1990 Changes in Human Sedentism, Mobility and Subsistence during the Plateau Pithouse Tradition on the Canadian Plateau. Paper presented at the 1990 meeting of the American Anthropological Association, Las Vegas.
1992 Integrated Lithic Analysis: The Significance and Function of Key–Shaped Formed Unifaces on the Interior Plateau of Northwestern North America. Unpublished MA thesis, Simon Fraser University, Department of Archaeology, Burnaby.

1993 Early prehistoric occupation of south–central British Columbia: a review of the evidence and recommendations. Changing Times: British Columbia Archaeology in the 1980's, B.C. Studies 99:140–183.

2004 A Culture Historic Synthesis and Changes in Human Moility, Sedentism, Subsistence, Settlement and Populations on the Canadian Plateau, 7000–200 BP. In Complex Hunter–Gatherers: Evolution and Organization of Prehistoric Communities on the Plateau of Northwestern North America, W. Prentiss and I. Kuijt (editors), The University of Utah Press, Salt Lake City:3–22.

2005 Personal communication. Lithic Workshop (Langara Archaeology Field School) 19 May 2005, Langara College, Vancouver.

Rousseau, M. and T. Richards

1985 A culture–historical sequence for the south Thompson River–western Shuswap Lakes region of British Columbia. Northwest Anthropological Research Notes 19 (1):1–32.

1988 The Oregon Jack Creek Site (EdRi–6): A Lehman Phase site in the Thompson River Valley, British Columbia. Canadian Journal of Archaeology 12: 39–63.

Rousseau, M., R. Muir, D. Alexander, J. Breffitt, S. Woods, K. Berry and T. Van Galen

1991 Results of the 1989 Archaeological Investigations Conducted in the Oregon Jack Creek Locality, Thompson River Region, South–central British Columbia. Permit No. 1989–76. Manuscript on file, Archaeology Branch, Victoria.

Ruby, R.H. and J.A. Brown

1992 A Guide to the Indian Tribes of the Pacific Northwest. University of Oklahoma Press, Oklahoma City.

Ryder, J.

1971 The stratigraphy and morphology of para–glacial alluvial fans in south–central British Columbia. Canadian Journal of Earth Sciences 8:279–298.

Salo, L.V.

1987 Similkameen River Multipurpose Project Feasibility Study Cultural Resource Reconnaissance Technical Report. U.S. Army Corps of Engineers, Seattle.

Sanger, D.

1966 Excavations in the Lochnore–Nesikep Locality, British Columbia: interim report. National Museums of Canada, Anthropological Paper No. 12, Ottawa.

1967 Prehistory of the Pacific Northwest as seen from the Interior of British Columbia. American Antiquity 32 (2): 186–197.

1968a Prepared core and blade traditions in the Pacific Northwest. Arctic Anthropology 5 (1): 92–120.

1968b The High River microblade industry, Alberta. Plains Anthropologist 13 (41):190–208.

1969 Cultural traditions: Interior British Columbia. Syesis 2 (1 & 2): 192–200.

1970a The archaeology of the Lochnore–Nesikep locality, British Columbia. Syesis 3 (Supplement 1): 1–146.

1970b Mid–latitude core and blade traditions, Arctic Anthropology 7: 106–114.

Sanger, D., R. McGhee and D. Wyatt

1970 Appendix I: Blade description. Arctic Anthropology 8 (2): 115–116.

Sapir, E.

1916 Time Perspective in Aboriginal American Culture: a Study of Method. Anthropological Series 13, Canada Department of Mines, Geological Survey Memoir No. 90, Ottawa.

1929 Central and North American languages. Encycolpedia Britannica (14th edition), Vo. 5:138–141 (cited in Hunn 2000).

1949 Time perspective in Aboriginal American culture: a study in method. In Selected Writings of Edward Sapir, D.G. Mandelbaum (editor), University of California Press, Berkeley:389–462.

Sappington, R.L.

1994 The Prehistory of the Clearwater River Region, North–central Idaho. Unpublished Ph.D dissertation, Washington State University,

Schalk, R.

1980 Cultural Resource Investigations for the Second Powerhouse Project at McNary Dam, Near Umatilla, Oregon. Washington State University Laboratory of Archaeology and History Project Report 1, Pullman.

Schalk, R. and G. Cleveland

1983 A chronological perspective on hunter–gatherer land use strategies in the Columbia Plateau. In Cultural Resource Investigations for the Lyons Ferry Fish Hatchery Project near Lyons, Ferry, Washington, R. Schalk (editor), Washington State University Laboratory of Archaeology and History Project Report No. 8, Pullman:11–56.

Schalk, R., R. Atwell, W. Heldebrandt, C. Lebow, P. Mikkelsen and R. Pettigrew

1995 Mobility and Intensification. In Archaeological Investigations, PGT–PG&E Pipeline Expansion Project, Idaho, Washington, Oregon and California, Volume 5: Summary and Findings. R. Schalk (editor). Manuscript on file, Oregon State Historic Preservation Office, Salem:9.1–9.43.

Service, E.R.

1971 Primitive Social Organization: An Evolutionary Perspective (2nd Edition), Random House, New York.

Shanks, M. and C. Tilley

1992 Reconstructing Archaeology (2nd edition). Routledge, London.

Shaw, P.A.

2001 Language and identity, language and land. B.C. Studies 131:39–55. [http://fnig.arts/ubc.ca/pdfs/Shawlangland.pdf].

Shennan, S.J.

1989 Introduction. In Archaeological Approaches to Cultural Identity. S.J. Shennan (editor), Unwin and Hyman, London: 1–32.

Shwinkin, A.D.

1979 Daka de'nin's village and the Dixthada Site: A Contribution to Northern Athapaskan Prehistory. National Museum of Man Mercury Series. Archaeological Survey of Canada Paper No. 91, Ottawa.

Simonsen, B., S. Peacock, J. Haggerty, J. Secter and F. Duerden
1997 Report of the First Nations Cultural Heritage Impact Assessment and Consultation Component; Bamberton Town Development Project. Manuscript prepared for The Environmental Assessment Office, Province of British Columbia and Greystone Properties Ltd., Victoria. [http://www.eao.gov.bc.ca/epic/output/documents/p129/1054751565015_82a994666a2b4e47abadfc50318f20f1.pdf]

Sims, C.
1971 Edged Cobbles of the Pacific Northwest. Tebiwa 14(2):21 – 38.

Singleton, T.A. and C.E. Orser Jr.
2003 Descendant communites: linking people in the present to the past. In Ethical Issues in Archaeology, L.J. Zimmerman, K.D. Vitelli and J. Hollowell–Zimmer (editors), Altamira Press, New York: 143–152.

Skinner, C.S.
2002 Personal communication. Northwest Obsidian Laboratory, Eugene.

Smith, A.H.
1987 Ethnography of the North Cascades. Washington State University, Center for Northwest Anthropology Project Report No. 7, Pullman.

Smith, D.G., R.S. Malhi, J.A. Eshleman and F.A. Kaestle
2000 Report on DNA analysis of "Kennewick Man" from Columbia Park, Washington. Archaeology Program, National Park Service, United States Department of the Interior. [http://www.cr.nps.gov/archaeology/ Kennewick/smith.htm].

Smith, H.I.
1900 Archaeology of the Thompson River Region, British Columbia. American Museum of Natural History Memoirs 4 (6).
1907 Archaeology of the Gulf of Georgia and Puget Sound. American Museum of Natural History Memoirs 5 (6).
1910 Archaeology of the Yakima Valley. American Museum of Natural History, Anthropological Papers 6 (1).

Smith, L.
2004 Archaeological Theory and the Politics of Cultural Heritage. Routledge, New York.

Solberger, J.B. and L.W. Patterson
1983 A pressure method for microblade manufacture. Lithic Technology 12: 25–31.

Spaulding, A.
1960 The dimensions of archaeology. In Essays in the Science of Culture in Honor of Leslie A. White, G. Dole and R. Carneiro (editors), Crowell Publishing Co., New York:437–456.

Spier, L.
1938 Preface. In The Sinkaietk or Southern Okanagon of Washington, W. Cline, R. Commons, M. Mandelbaum, R. Post and L. Waters (editors), General Series in Anthropology No. 6, Contributions from the Laboratory of Anthropology 2, George Banta Publishing Company, Menasha:3–8.

Sprague, R.
1991 A bibliography of James Teit. Northwest Anthropological Research Notes 25 (1): 103–115.

Squakin, Hazel.
2000 Personal communication. Elder, Upper Similkameen Indian Band, Hedley.

Sterner, R.
1997 Color Landform Atlas of the United States. [http://fermi.jhuapl.edu/states/ states.html]

Stevens, V.
1995 Wildlife Diversity in British Columbia: Distribution and Habitat Use of Amphibians, Reptiles, Birds and Mammals in Biogeoclimatic Zones. B.C. Ministry of Forests Research Program, Victoria.

Stevenson, M.
1986 Window on the Past: Archaeological Assessment of the Peace Point Site, Wood Buffalo National Park, Alberta. Studies in Archaeology, Architecture and History, Parks Canada, Ottawa.

Stone, P.G. and R. MacKenzie
1990 Introduction. In The Excluded Past: Archaeology in Education, P.G. Stone and R. MacKenzie (editors), Routledge, London:1–14,

Strong, E.
1959 Stone Age on the Columbia River. Binfords and Mort, Portland.

Stryd, A.H.
1973 The Later Prehistory of the Lillooet Area, British Columbia. Unpublished PhD dissertation, University of Calgary, Calgary.
1994 Personal communication. Arcas Heritage Consulting, Port Moody.
1997a Culturally Modified Trees of British Columbia: A Handbook for the Identification and Recording of Culturally Modified Trees. British Columbia Ministry of Forests, Vancouver Forest Region, Nanaimo.
1997b Personal communication. Arcas Heritage Consulting, Port Moody.
1998 Personal communication. Arcas Heritage Consulting, Port Moody.
2000 Personal communication. Arcas Heritage Consulting, Port Moody.

Stryd, A.H. and S. Lawhead
1978 Reports of the Lillooet Archaeological Project Number 1: Introduction and Setting. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 73, Ottawa.
1983 Bethlehem Copper Corporation Lake Zone Development Heritage Mitigation Study. Permit #1982–19. Archaeology Branch, Victoria.

Stryd, A. and M. Rousseau
1996 The early prehistory of the mid Fraser–Thompson River area. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona, UBC Press, Vancouver: 177–204.

Stuiver, M. and G.W. Pearson
1993 High precision bidecadal calibration of the radiocarbon time scale, AD 1950–500 bc and 2500–6000 bc. Radiocarbon 35 (1): 1–24.

Stuiver, M. and P. Reimer
1993 Extended 14C database and revised Calib 3.0 14C age calibration program. Radiocarbon 835: 215–230.

Suttles, W.
1987 Northwest Coast linguistic history – a view from the Coast. In Coast Salish Essays, W. Suttles (editor), Talonbooks, Vancouver:265–281.
1990 Introduction. In Handbook of North American Indians Volume 7: Northwest Coast, W. Suttles (editor), Smithsonian Institution, Washington DC:1–15.

Suttles, W. and W. Elmendorf
1963 Linguistic Evidence for Salish Prehistory. In Symposium on Language and Culture. Proceedings of the 1962 Annual Spring Meeting of the American Ethnological Society, V. Garfield and W. Chafe (editors), University of Washington Press, Seattle:42–52.

Swadesh, M.
1959 Linguistics as an instrument of prehistory. Southwestern Journal of Anthropology 15:20–35.

Swanson, E.H. Jr
1962 The Emergence of Plateau Culture. Occasional Papers of the Idaho State College Museum No. 8, Pocatello.

Suttles, W. and W. Elmendorf
1963 Linguistic evidence for Salish prehistory. Proceedings of the 1962 Annual Spring Meeting of the American Ethnological Society, V. Garfield (editor), Seattle,Washington:41–52.

Swanton, J.R.
1952 Indian Tribes of the Pacific Northwest. Bureau of American Ethnology Bulletin 145, Washington.

Sykes, K.
1993 An Archaeological Impact Assessment of a Proposed Two–acre, "Single Residential" Addition to a Mobile Home Park and Campsite. Permit No. 1993–79. Manuscript on file, Archaeology Branch, Victoria.

Tabarev, A.V.
1997 Paleolithic wedge–shaped microcores and experiments with pocket devices. Lithic Technology 22 (2):139–149.

Tarasca, C.
2003 Personal communication. Ph.D (Zooarchaeology) candidate, Dept. Archaeology, Simon Fraser University, Burnaby.

Tarlow, S.
2006 Archaeological ethics and the people of the past. In The Ethics of Archaeology: Philosophical Perspectives on Archaeological Practice, C. Scarre and G. Scarre (editors), Cambridge University Press, Cambridge: 199–216.

Taylor, R.E, D.L. Kirner, J.R. Southon, and J.C. Chatters
1998 Radiocarbon Dates of Kennewick Man. Science 280:1171–1172.

Taylor, R.E., D.G. Smith and J.R. Southen
2000 The Kennewick skeleton: chronological and biomolecular contexts. Kennewick Man Cultural Affiliation Report Chapter 1,Appendix 1. [http://www.cr.nps.gov/aad/Kennewick/Taylor2.htm].

Taylor, W.E. Jr.
1962 A distinction between blades and microblades in the American Arctic. American Antiquity 27 (3): 425–426.

Taylor, H.C. Jr. and G.F. Grabert
1984 Western Washington Indian Socio–economics: Papers in Honor of Angelo Anastasio. Western Washington University, Bellingham.

Teit, J.A.
1895 The Tinneh Tribe of Nicola Valley. British Association for the Advancement of Science 65: 551–555.
1900 The Thompson Indians of B.C. Memoir of the American Museum of Natural History, Volume II, (Jesup North Pacific Expedition Volume I, Part 4): 163–292.
1908 Notes on rock painting in general. Ms. on file with the Archaeology Branch, Victoria.
1930 The Salishan Tribes of the Western Plateaus. Forty–fifth Bureau of American Ethnology Annual Report: 25–396.

Thompson, L.C. and M.D. Kinkade
1990 Languages. In Handbook of North American Indians Volume 7: Northwest Coast, W. Suttles (editor), Smithsonian Institution, Washington DC:30–51.

Thoms, A.V.
1987 Upland Land Use and the Initial Assessment of 45PO148: The Sullivan Lake Archaeological Project, Northeastern Washington. Center for Northwest Anthropology Washington State University Contributions in Cultural Resource Management No. 19, Pullman.

Torrence, R.
1989 Retooling: toward a behavioural theory of stone tools. In Time, Energy and Stone Tools, R. Torrence (editor), Cambridge University Press, Cambridge: 57–66.

Trigger, B.
1989 A History of Archaeological Thought. Cambridge University Press, Cambridge.

Turnbull, C.J.
1977 Archaeology and Ethnohistory in the Arrow Lakes, Southeastern British Columbia. National Museum of Man Mercury Series No. 65, National Museum of Man, Ottawa.

Turner, C.G.
1983 Dental Evidence for the Peopling of the Americas. In Early Man in the New World, R. Shutler (editor), Sage Publications, Beverly Hills:147–158.

Turner, N.J.
1978 Food Plants of British Columbia Indians Part 2: Interior Peoples. British Columbia Provincial Museum Handbook No. 36, Victoria.
1979 Plants in British Columbia Indian Technology. British Columbia Provincial Museum Handbook No. 38, Victoria.
1998 Plant Technology of First Peoples in British Columbia. UBC Press, Vancouver.

Turner, N.J., R. Bouchard and D. Kennedy
1980 The Ethnobotany of the Okanagan–Colville Indians of British Columbia and Washington. British Columbia Provincial Museum, Victoria.

Turner, N.J., L. Thompson, M. Thompson and A. York
1990 Thompson Ethnobotany: Knowledge and Usage of Plants by the Thompson Indians of British Columbia. Royal British Columbia Museum Memoir No. 3, Victoria.

Ucko, P.J.
1989 Forward. In Conflict in the Archaeology of Living Traditions. R. Leyton (editor), Unwin Hyman Publishing Co., London:ix–xvii.
1990 Preface. In The Excluded Past: Archaeology in Education, P. Stone and R. MacKenzie (editors), Routledge, London: i–xxx.

U.S. Army Corps of Engineers
1952 Columbia River and Tributaries, Northwestern United States. Eight Volumes, House Document No. 531, 81st Congress, 2nd Session, Vol. 1., Government Printing Office, Washington, D.C.

U.S. Department of Interior
2000 Kennewick Man. National Park Service, U.S. Department of the Interior Archeology Program. [http://www.cr.nps.gov/archeology/kennewick/ index.htm].

Vivian, B.C.
1989a A Survey and Assessment of the Prehistoric Cultural Resources of the Princeton Basin, upper Similkameen Valley, British Columbia. Permit #1987–9. Archaeology and Outdoor Recreation Branch, Victoria.
1989b A Survey and Assessment of the Cultural Resources in Cathedral Provincial Park, B.C. Permit #1988–80. British Columbia Ministry of Environment and Parks, Southern Interior Region, Kamloops.
1992 Similkameen Valley Prehistory: Cultural Interaction across the Interior Plateau of British Columbia and Washington State. Unpublished MA thesis, University of Calgary, Dept. Archaeology, Calgary.

Von Krogh, G.H.
1980 Archaeological Investigations at the Flood and Pipeline Sites, Near Hope, British Columbia. Unpublished MA thesis, Simon Fraser University, Dept. Archaeology, Burnaby.

Walker, D.E. Jr.
1998 Introduction. In Handbook of North American Indians Volume 12: Plateau, D.E. Walker Jr (editor), Smithsonian Institution, Washington DC: 1–7.

Walker, D.E. Jr. and R. Sprague
1998 History until 1846. In Handbook of North American Indians Volume 12: Pateaus, D.E. Walker, Jr. (editor), Smithsonian Institution, Washington DC:138–148.

Warren, C., A. Bryan and D. Tuohy
1962 The Goldendale site and its place in Plateau prehistory. Tebiwa 6 (1): 1–21.

Warren, C.
1968 The View from Wenas: A Study in Plateau Prehistory. Idaho State University Museum Occasional Papers No. 24, Pocatello.

Warren, C., C. Sims and M. Pavesic
1968 Cultural chronology in Hells Canyon. Tebiwa 11 (2):1–37.

Watkins, J.
2000 Indigenous Archaeology: American Indian Values and Scientific Practice. Altamira Press, New York.
2003 Archaeological ethics and American Indians. In Ethical Issues in Archaeology, L.J. Zimmerman, K. D. Vitelli and J. Hollowell–Zimmer (editors), Altamira Press, New York: 129–142.

Webber, J.P.
1993 Fur trading posts in the Okanagan and Similkameen. Okanagan Historical Society 57:6–33.

Wessen, G.
1990 The archaeology of the ocean coast of Washington. In Handbook of North American Indians Volume 7: Northwest Coast, W. Suttles (editor), Smithsonian Institution, Washington DC:412–421.

West, F.H.
1967 The Donnelly Ridge site and the definition of an early core and blade complex in Central Alaska. American Antiquity 32 (3):360–382.
1981 The Archaeology of Beringia. Columbia University Press, New York.
1996a (editor) American Beginnings: The Prehistory and Palaeoecology of Beringia. The University of Chicago Press, Chicago.
1996b Beringia and New World origins II: the archaeological evidence. In American Beginnings: The Prehistory and Palaeoecology of Beringia, F.H. West (editor), The University of Chicago Press, Chicago: 537–559.

1998 Denali complex. In Archaeology of Prehistoric America: An Encyclopedia, G. Gibbon (editor), Garland Publishing, New York: 204–207.

West, K.D. and J.A. Donaldson
2001 Resedimentation of the late Holocene White River tephra, Yukon Territory and Alaska. Yukon Exploration and Geology 2001: 239–247.

Whitely, P.M.
2002 Archaeology and oral tradition: the scientific importance of dialogue. American Antiquity 67 (3): 405–415.

Whitlam, R.G.
1976 Archaeology in the Williams Lake Area, British Columbia. Occasional Papers of the Archaeological Sites Advisory Board of British Columbia 1, Victoria.
1980 Archaeological Investigations at Cache Creek (EcRh–3). Occasional Papers of the British Columbia Heritage Conservation Branch 5, Victoria.

Whittaker, J.C.
1994 Flint Knapping: Making and Understanding Stone Tools. University of Texas Press, Austin.

Wickwire, W.
1980 The contribution of a Colonial ethnographer: Charles Hill–Tout, 1858–1944. Canadian Folklore Canadien 2 (1–2):62–67.
1993 Women in Ethnography: the research of James A. Teit. Ethnohistory 40 (4): 539–561.

Willey, G.R. and P. Phillips
1958 Method and Theory in American Archaeology. University of Chicago Press, Chicago.

Wilmeth, R.
1977 Pit house construction and the disturbance of stratified sites. Canadian Journal of Archaeology 1: 135–140.
1978 Anahim Lake archaeology and the early historic Chilcotin Indians. National Museum of Man Mercury Series Archaeological Survey of Canada Paper No. 82, Ottawa.
1979 An Athapaskan hypothesis. Canadian Journal of Archaeology 3: 33–40.

Wilson, C.
1895 Report on the Tribes Inhabiting the Country in the Vicinity of the 49th Parallel. Transactions of the Ethnological Society 4 (New Series), London.
1970 Mapping the Frontier: Charles Wilson's Diary of the Survey of the 49th Parallel. G. Stanley (editor), MacMillan Press, Toronto.

Wilson, I.R.
1991 Excavations at EdQx 41 and 42, and Site Evaluation at EdQx 43 Monte Creek. Permit No. 1990–140. Manuscript on file, Archaeology Branch, Ministry of Tourism and Culture, Victoria.
1996 Paleoindian sites in the vicinity of Pink Mountain. In Early Human Occupation in British Columbia, R.L. Carlson and L. Dalla Bona (editors), UBC Press, Vancouver: 29–34.

Wilson, I.R., B. Smart, N. Heap, J. Warner, T. Ryals, S. Woods and S. MacNab
1992 Excavations at Baker Site, EdQx–43, Monte Creek: Volumes I and II. Permit No. 1991–107. Manuscript on file, Archaeology Branch, Victoria.

Winterhalder, B.
2001 The behavioural ecology of hunter–gatherers. In Hunter–Gatherers: An Interdisciplinary Perspective, C. Panter–Brick, R.H. Layton and P. Rowley–Conwy (editors), Cambridge University Press, Cambridge: 12–38.

Wisner, G.
1999 Cooper's Ferry Spear Cache One of NW's Oldest Sites. Mammoth Trumpet 13 (4): 1998. [http://www.peak.org/csfa/mt3–4.html].

Woodburn, J.
1982 Egalitarian societies. Man 47: 431–451.

Workman, B.
1977 The prehistory of the southern Tutchone area: problems in the prehistory of the North American subarctic. In Problems in the Prehistory of the North American Subarctic: the Athapaskan Question, J. Helmer, S. Van Dyke and F. Kense (editors), University of Calgary, Calgary: 46–54.
1979 The significance of volcanism in the prehistory of subarctic northwest North America. In Volcanic Activity and Human Ecology, P. Sheets and D. Grayson (editors), Academic Press, New York: 339–371.

Wormington, H.M. and R.G. Forbis
1965 An Introduction to the Archaeology of Alberta, Canada. Proceedings of the Denver Museum of Natural History 11, Denver.

Wyatt, D.
1970 Microblade attribute patterning: a statistical examination. Arctic Anthropology 8 (2): 97–104.
1971 A preliminary outline of Nicola Valley prehistory. In Aboriginal Man and Environments on the Plateau of Northwest America, A. Stryd and R. Smith (editors), University of Calgary Archaeological Association, Calgary:60–72.
1972 The Indian History of the Nicola Valley. Unpublished PhD dissertation, Brown University.
1998 Nicola. In Handbook of North American Indians Vol. 12: Plateau, D.E. Walker, Jr. (editor), Smithsonian Institution, Washington, D.C.:220–222.

Yellen, J.E.
1977 Archaeological Approaches to the Present: Models for Reconstructing the Past. Academic Press, New York.

Yesner, D.R. and G. Pearson
2002 Microblades and migrations: ethnic and economic models in the peopling of the Americas. In Thinking Small: Global Perpsectives on Microlithization, R.G. Elston and S.L. Kuhn (editors), Archaeological Papers of the American Anthropological Association No. 12, Arlington.

York, A., R. Daly and C. Arnett
1993 They Write Their Dreams on the Rock Forever: Rock Writings in the Stein River Valley of British Columbia. Talonbooks, Vancouver.

– APPENDIX A –

SITE DESCRIPTIONS

Archaeological sites mentioned in previous chapters are briefly described. Additional information for most sites can be found in reports to the Archaeology Branch, government of British Columbia. Some information (e.g., DiRa–20 and DhRa–02 site descriptions) cannot be found in government databanks as this information is curated with the Upper Similkameen Indian Band.

The Stirling Creek Bridge site (DiRa–09)

The most significant site investigated to date is the Stirling Creek Bridge site (DiRa–09), situated approximately six kilometers west of the town of Hedley, B.C. This multi–component site was tested for significance in 1994 (Copp 1994; Eldridge 1994) and mitigated in 1995 (Copp 1995). Of particular importance was the presence of micocrores and microblades observed in 1994. The association of Plateau Microblade Tradition artifacts (cf. Sanger 1970a) and intact deposits indicated that the site was one of extreme importance to the Similkameen First Nations as well as to the archaeological community. This project recovered diagnostic artifacts of the Cascade Horizon (4,500–7,500 BP), as well as the microblade industry.

Highway construction crews destroyed a major portion of the site while excavations were still in progress. Standing timber and sediments were removed for the bridge right–of–way. This work was monitored for destruction or exposure of cultural materials. Cultural and non–cultural sediments were used to construct a berm on the upper earth roadway to the southeast of the proposed bridge right–of–way at the request of the Upper Similkameen First Nation due to concerns over the potential loss of this evidence of their ancestors' presence.

Excavation and Monitoring Results. Intensive excavations of the main area deposits northwest of the bridge right–of–way revealed pre–contact components. Typological analysis dated these from 1,500 to 8,000 BP, with surface materials dating ca. 200–1,500 BP. These estimates were confirmed by three radiometric analyses on ungulate bones dating sub–surface components between ca. 1,800–7,400 BP (Copp 1995, 1997a). Monitoring resulted in the recovery of diagnostic cultural materials. These included lithic debitage, flake cores, microblades, microcores and projectile points. Of interest was the recovery of a single Lochnore side–notched projectile point – a rare type outside of the mid Fraser–Thompson River region.

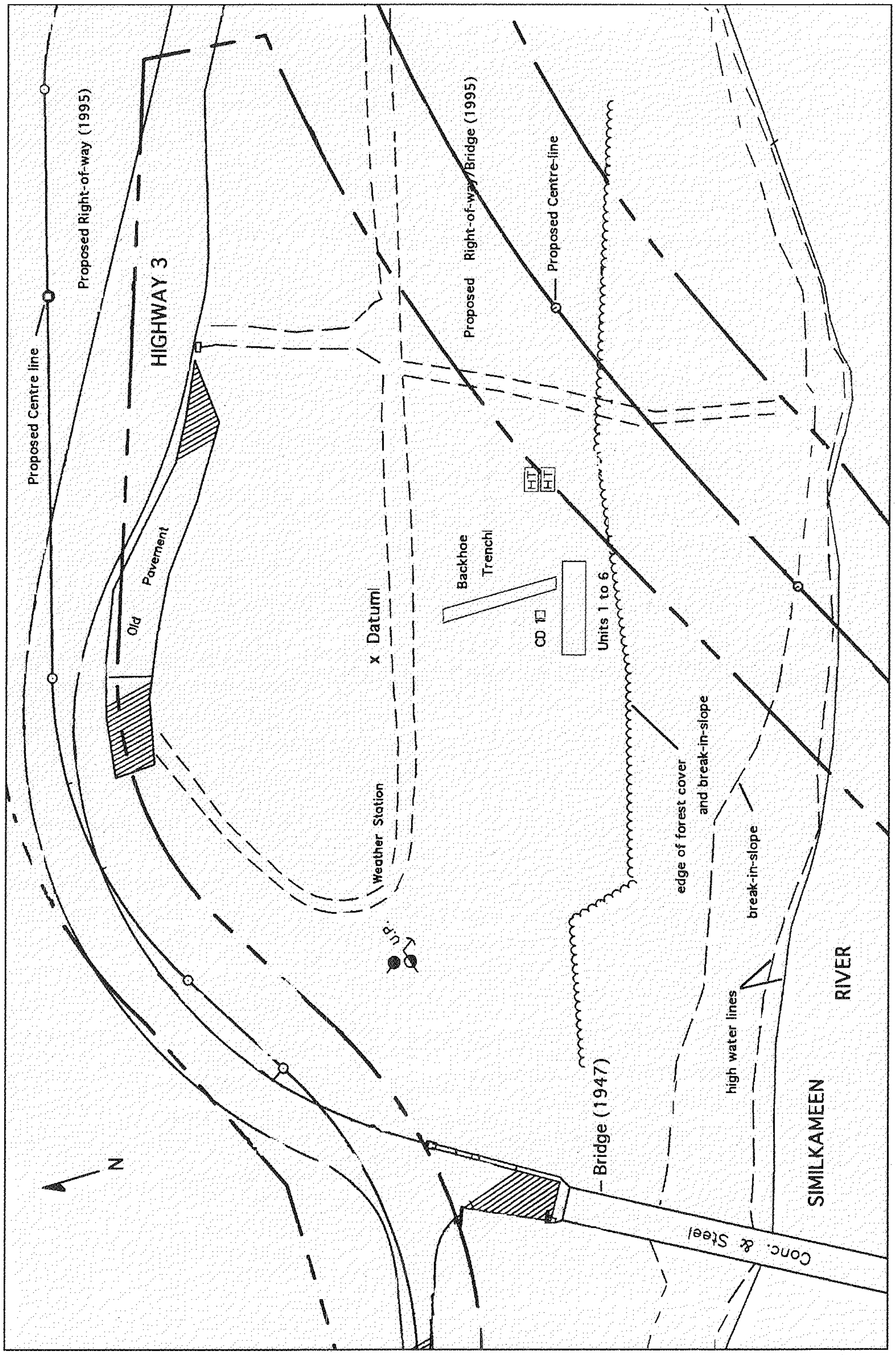

Figure 8.1: Stirling Creek Site Planimetric Map

Excavation Methodology. The main open site area was block–excavated using individual 2.0 m^2 units. Each unit was divided into 1–m^2 quadrants and further subdivided into 0.50 m^2 sub–quadrants in order to maximize provenience information for materials not recovered *in situ* (see Figure 8.1). Excavation was accomplished by a combination of shovel shaving and hand trowel removal of all culture–bearing sediments. Artifacts and features were left *in situ* wherever practical. All deposits were passed through 1/8" (4 mm) mesh screen with level bags kept of materials retained in the screens. Use of small mesh screen insured maximal recovery of microblades. Apart from the block excavation, these methods were used on all sites investigated for this thesis. An excavation strategy involving quadrant and sub–quadrant recovery of cultural materials was implemented, with both natural and arbitrary vertical level provenience recording strategies. Excavation in arbitrary 10 cm levels was considered sufficient given a noticeable lack of visible stratification in the culture–bearing sediments. This made excavation more difficult than usual for Plateau sites with sandy–loam sediments.

Cultural Stratigraphy. Excavations in the main trench area, as well as testing of other portions of the site indicated development over glacio–fluvial sediments that had been deposited on a late Pleistocene–early Holocene boulder and cobble river lag deposit. This basal deposit forms the culturally sterile basement zone of the site although artifacts were found between cobble crevices at depths of ca. 1.0 meter below surface. This ancient riverbed is evidence of a wider and deeper early Holocene Similkameen river, the modern river channel having since down cut into these deposits.

Cultural sediments consisted primarily of medium to fine grain–sized sandy–loams ranging from light, yellowish to dark brown colours (Munsell 10YR 5/3 to 10YR 4/3). Materials taken from two column samples from either end of the trench provided high sphericity particle values as well as matte finishes on quartz crystals. This is consistent with sediments derived from glacio–fluvial sources with some (later) aeolian transportation. Probable aeolian transport mechanisms in the past include higher than modern velocity winds associated with the Altithermal temperature maxima ca. 8,400–6,700/6,000 BP or earlier (Alley 1976; Kershaw 1978; Nickman and Leopold 1985; Ryder 1971) as evidenced elsewhere in south–central British Columbia and north–central Washington State.

Observations of clay–sized particles at the base of the cultural deposits situated between basal river cobbles and boulders suggested low velocity fluvial deposition at depths greater than ca. 0.85 to 1.0 meter below surface. A thin band of angular pebbles was encountered at this depth across most excavation units. It is probable that they represent a fluvial incursion associated with late glacial ice–dams on the Similkameen to the south and associated upriver pondage activities. An alternate explanation could involve river damming due to early Holocene mass wasting rather than ice–damming.

Pedogenic processes at depths of less than 0.85 to 1.0 meter below surface (depending upon excavation unit provenience) indicated a combination of Aeolian activity and downslope wasting. It is in, and upon, the sandy–loams that the majority of cultural materials were encountered. In common with some Interior Plateau sites, there was no definite soil profile colour change to indicate discrete components. Soil colour and texture appeared to be similar at all depths – ranging from light yellowish to darker brown sandy–loams. This strongly suggests post–occupation mixing of materials vertically and horizontally due to natural pedogenic processes as well as cultural activity.

In open sites depositional and post–depositional factors may result in vertical and horizontal transportation of artifacts and features. The result is a blending of occupation (anthropogenic) and other sediment–forming events that are difficult to isolate even with physical and chemical analysis.

Cultural Materials Recovered. A diagnostic lithic assemblage totaling 2217 artifacts, exclusive of debitage, derived from the main excavation trench units (See Table A.1). Temporally diagnostic artifacts salvaged during the 1995 monitoring of soil removal activities are not included in this table, but do feature in non–main excavation area analysis.

Vertical Occupation Zones. The definition of vertically and horizontally blended occupation areas or components, separated by some interval of time, rests upon examination of stratigraphic relationships of material in cultural deposits including the relative frequency of fire–altered rock (FAR) and debitage, the frequency and/or occurrence of diagnostic artifacts per 10 cm level, plus radiometric assays.

Physical analysis of the cultural sediments indicated that there was little difference among three cultural strata defined in the field:

Stratum 1: A moderate to heavily disturbed layer extending from the surface to ca. 10 to 15 cm below surface comprised of loose to compact sandy silty–clays with FAR, pre–contact and historical materials (cultural stratum 4),

Stratum 2: a moderate to heavily compacted zone of sandy silty–clays, FAR and artifacts to ca. 80 cm below surface (cultural strata 2 and 3),

Table A.1: DiRa–09 Artifacts

KEY:
MB microblades: AA complete
PR proximal fragment
SH mid–section
DS distal fragment
CR microblade core: RJ core rejuvenation flake
PT projectile point: BA base (PT or BF)
BF biface TP tip (PT or BF)
PF preform MS mid–section (PT or BF)
OT other
FR fragment
QC quartz crystal

LEVEL:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**N**
PT–AA	2	7	1	2				2	1		15
PT–TP		2	4	2			1				9
PT–BA	1	2	3			1	3	1			11
PT–MS		1									1
BF		29	2								31
PF	1	1	1	2	1	3	5	4	1		19
MB–AA	17	48	51	114	113	112	90	84	37	2	668
MB–SH	10	13	175	119	85	103	93	65	30	3	696
MB–PR	21	18	67	102	39	23	40	72	47	3	432
MB–DS	8	19	29	54	34	26	44	27	23		264
CR	1	2	3	4	2	2	6	1	1		22
CR–PF			1	5		2	2	2	1		13
CR–RJ		3	1	6	2	1	5	5			23
CR–QC			2		2	4	4	1	1		14
OT						1					1
TOTALS:	**63**	**147**	**335**	**410**	**276**	**277**	**292**	**267**	**141**	**8**	**2217**

Stratum 3: a heavily compacted zone of sandy silty–clays, artifacts and FAR with cobbles and boulders extruding from stratum 4 extended ca. 80–100 cm below surface (cultural stratum 1) and,

Stratum 4: a dense level of cobbles and river boulders set in clay.

Physical analysis confirmed that soil ontogeny was based on glacio–fluvial and aeolian parent materials as determined by preliminary field analysis. The condition of surface sediments at the site indicated past use as a road surface. Vehicle traffic, both motorized and horse–drawn, had compressed all sediments down to the early Holocene river cobbles and boulders. As such, discrete stratigraphic and cultural material patterns may have been obscured by these compression factors whose extent is unknown.

Component Definition. Frequency distributions or artifacts, debitage, faunal remains and FAR indicate the presence of three pre–contact components from oldest to most recent:

Component 1: the earliest component 70–90 cm below surface,

Component 2: a second component 40–70 cm below surface,

Component 3: a third component at 20–40 cm below surface, and

Component 4: a mixed pre–contact/historical component from 0–20 cm below surface.

Radiocarbon Assays. Three radiocarbon assays were obtained on ungulate (deer and sheep or goat) bone collagen samples. Charcoal, although plentiful in the cultural deposits, was not definitely associated with hearth features and was thus considered less suitable for analysis than the definitely cultural faunal remains. The results indicate three occupations ca. 7,400; 7,000; and 1,800 BP. All samples were submitted to the Nagoya University Tandem Accelerator Facility (NUTA) for AMS dating. The assays are presented in stratigraphic and cultural order from earliest to most recent. Calibrated estimates were obtained using the Calib 3.1 program intercepts Method A; $t^{½}$ = 5,568 (Stuiver and Pearson 1993).

Sample #1: **7,400 ± 90 BP** (NUTA 4645)

Calibrated age: Cal BP 8,157–8,332 @ 1 sd (0.873 probability)

Cal BC 6,383–6,208 @ 1 sd (0.873 probability)

Located at 85 cm below surface, this sample is derived from the distal end of an ungulate (deer, sheep or goat) femur.

Sample #2: **6,920 ± 100 BP** (NUTA 4644)

Calibrated age: Cal BP 7,663–7,841 @ 1 sd (0.975 probability)

Cal BC 5,892–5,714 @ 1 sd (0.975 probability)

This estimate derives from a single ungulate (deer, sheep or goat) diaphysis exhibiting stone tool cut marks. With a provenience of 60 to 70 cm below surface, this sample and sample #1 fall within the established temporal range for the early Cascade Horizon (4,500–7,500 BP) of the northern Columbia Plateau.

Sample #3: **1,810 ± 90 BP** (NUTA 4687)

Calibrated age: Cal BP 1,687–1,826 @ 1 sd (0.698 probability)

Cal AD 124–263 @ 1 sd (0.698 probability)

A combined sample of fragmented ungulate bones (deer, sheep or goat) diaphyses located at 10 to 20 cm below surface provides an acceptable estimate for Component 3 as they were found below the level of historical disturbance. The sample also was horizontally and stratigraphically associated with a cache of biface blanks and four Type 6 projectile points which may have morphological ties to Thompson Plateau types dating 2,500–4,000 BP and northern Columbia Plateau variants dating 1,200–2,400 BP.

The lower component 1 and 2 estimates range from 6,900 to 7,400 BP. These dates fall within accepted ranges of the Mazama tephra falls. Mazama tephra occurred for at least two different periods; the first (Llao) fall is dated 7,015 ± 45 BP (Bacon 1983:104–105 cited in Matz 1991:28). Matz (1991) provided analytical data suggesting that the Llao fall was limited in range and may not have reached this portion of south–central British Columbia. A second major series of tephra events have been radiometrically dated (Matz 1991:28) using a weighted mean radiocarbon age based upon four charcoal samples near the source to 6,845 ± 50 BP.

The lack of physical evidence for a Mazama tephra lens in either component 1 or lower component 2 (Strata 3 and 2 respectively) probably indicates the physical eradication of evidence of the fall, otherwise noted in a number of locations in the Similkameen Valley (cf. Cormie 1981) through cultural or natural agents. Regardless of the nature of tephra displacment or mixing, it would appear that the second, and major, Mazama tephra fall had little effect on the ecology and culture of Similkameen inhabitants. Matz (1991: 45, Figure 13) suggests a maximum ash fall of ca. 5–10 cm in the area. His interpretation of the effect of such a thin layer of tephra is that it would have had minimal effects on Similkameen biota, being rapidly removed by rainfall and slope wash. The only other identified tephra in valley sites comes from the 1998 excavations of the Tcutcuwi'xa rock shelter (DhRa–02) where cultural materials pre–and post–dated a ca. 3,500 BP St. Helen's Yn tephra fall (Copp 1998f).

Diagnostic Artifacts. Diagnostic artifacts include only those items recovered from the main excavation area units 1 through 6. Projectile points, recovered from surface collections and those salvaged from monitoring soil extraction and tree removal activities also are included as they provide additional information pertinent to spatial and temporal distribution analyses.

The most sensitive artifacts with regard to temporal position are projectile points (Figures A2 to A4) and the microblade industry. A complete lack of formed unifaces precludes discussion of other Plateau *fossils directeurs* such as scrapers and key–shaped unifaces associated with Salishan occupations of the Fraser Plateau (cf. Rousseau 1992). This lack of formed unifaces and lack of storage features suggests that occupations were short, most likely seasonal, and oriented towards a limited number of activities – processing game and edible plants, as well as probable collection of plant fibres (e.g. ,Dogsbane) for processing into cordage.

Figure 8.2 illustrates the numbers and types of diagnostic artifacts recovered from the excavated sample, arranged by lithic type by arbitrary 10 cm level. Artifacts illustrated in Figures

A2 to A5 were recovered from back dirt resulting from sediment removal for bridge footings (see Figure A1). No other provenience could have been recorded. The projectile points (top row) indicate occupations dating within the last 4,000–6,000 years. The steatite pipe stem (centre) indicates historic occupations, and the quartz crystal, dacite and CCS microblades (bottom row) are characteristic of occupations from at least 1,800 BP or more recent.

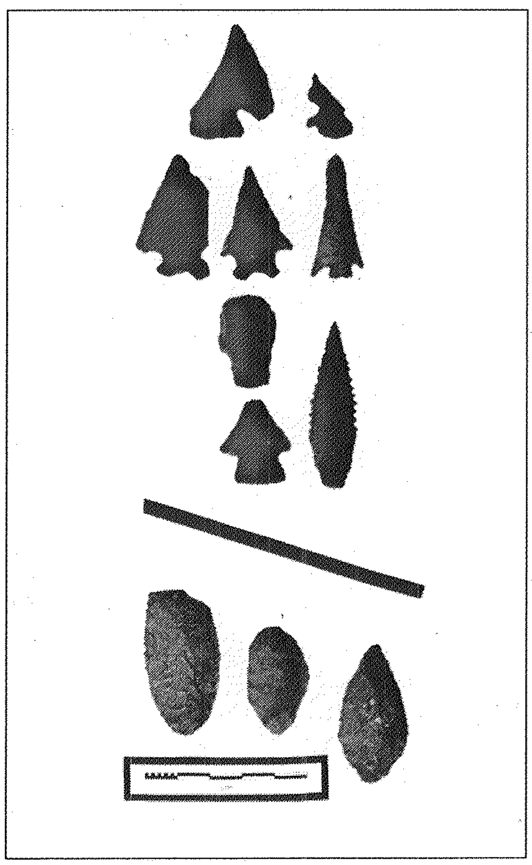

Figure 8.2: DiRa–09 Projectile Points (Stratigraphic)

Key:

Top row:	Columbia corner–notched A; Plateau small side–notched
2nd row:	Shuswap Horizon Types 3 and 4; Columbia corner–notched B
3rd row:	(top) Nespelem bar, (bottom) Columbia corner–notched A; (side) Cascade C with serrations
	Bottom Row: Cascade (leaf–shaped) variants

Projectile Point Analysis. Projectile point types range from leaf–shaped and incipient to contracting stemmed to corner–notched, corner–removed and side–notched varieties. Typological comparisons with Thompson Plateau, northern Columbia Plateau and Cascade Range sites indicate components dating from late Cascade Horizon to Late Pre–contact times. Discussion of projectile points for each component is as follows:

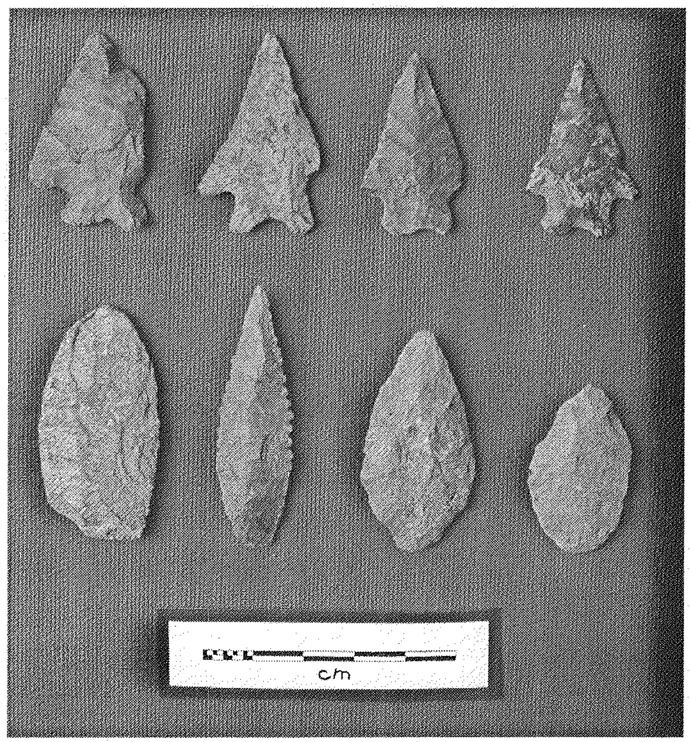

Figure 8.3: DiRa–09 Projectile Points

Key:

Top row:	Shuswap Horizon Types 3 and 4
Bottom row:	Cascade (leaf–shaped) variants

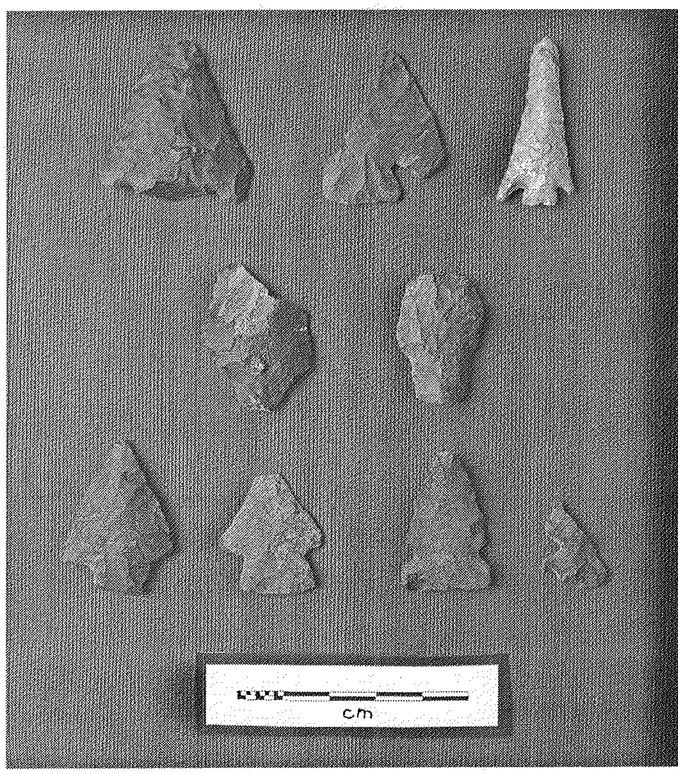

Figure 8.4: DiRa–09 Projectile Points

Key:

Top row: Columbia corner–notched A; Columbia corner–notched A; Wallulla rectangular stemmed

Middle: Rabbit Island B ("Similkameen Stemmed")

Bottom: Rabbit Island B; Columbia corner–notched A; Plateau small side–notched

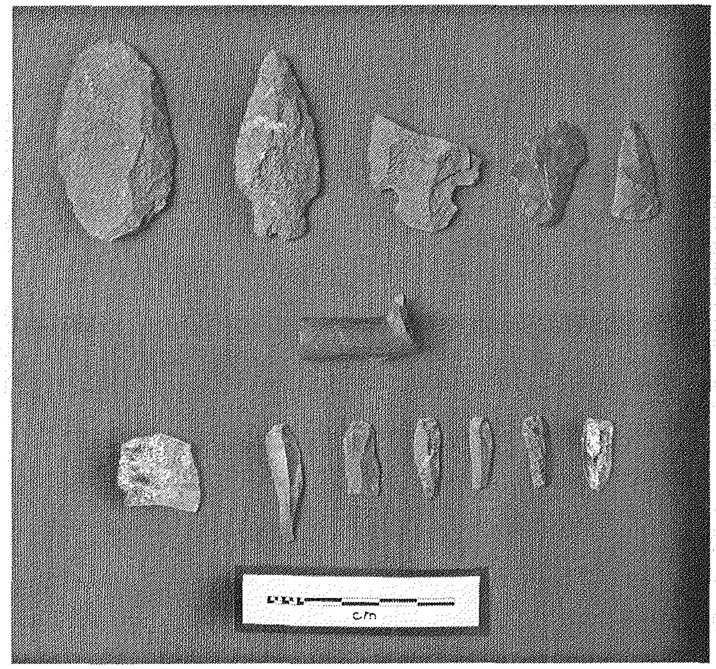

Figure 8.5: Monitored Artifacts (Site provenience only)

Key:
Top row: biface; Lochnore side–notched; Lehman Oblique–notched, Rabbit Island B; small triangular point
Middle: Elbow pipe stem fragment (steatite)
Bottom: (left) Quartz crystal shatter; microblades

Table A.2: Projectile Point Distribution

Note: numbers in parentheses ( ) indicate lack of provenience – soil removal monitor finds

Type	Variant	#	min age	max age
1	Cascade C	2	3000	8000
2	Cold Springs Side–notched	1	3500	7000
3	Mahkin Shouldered	2	3500	9000
4	Lehman Oblique–notched	(1)	4000	6000
5	Shuswap Horizon 1,2 and 8	(1)	2500	4000
6	Shuswap Horizon 3 and 4	4	2500	4000
7	Shuswap Horizon 5	(1)	2500	4000
8	Nespelem Bar(Shuswap 7)	2	1500	5000
9	Rabbit Island A	1	2000	4000
10	Columbia Corner–notched A	1	2000	4000
11	Quilomene Bar Corner–notched		1200	3000
Type	**Variant**	**#**	**min age**	**max age**
12	Quilomene Bar Basal–notched		300	2500
13	Wallulla Rectangular Stemmed	1	200	2000
14	Columbia Corner–notched B	1	150	2000
15	Plateau Side–notched	1	150	1800

Component 3 (1,500–2,000/2,500 BP). Component 3 projectile points included single small side–notched and corner–notched points common to northern Columbia and Thompson Plateaus. The corner–notched variety typologically dates between ca. 1,500 to 2,500 BP in areas adjacent to the Similkameen Valley. It is suggested that the presence of the diagnostically late period (ca. 150–2,000 BP) Plateau side–notched variants is the result of late surface materials mixing with underlying, deposits of Component 2 older than ca. 1,800 BP. All points found in this component originated within 20 cm of the surface. A single atypical corner–notched specimen was found 20 to 30 cm below surface.

Component 2 (4,500–6,000 BP). Component 2 projectile points consisted of a single Cascade C serrated–blade leaf–shaped point, a Nespelem Bar and a Rabbit Island A specimen located 40 to 50 cm below surface. Although diagnostically early, Cascade C points may be found in assemblages dating as recently as 3,000–4,000 BP in both plateaus. Lohse (1995) places Nespelem Bar and Rabbit Island points in a continuum of stemmed variants (Vivian's 1992 "Similkameen Stemmed" series) derived from earlier Cascade and Mahkin Shouldered types (Lohse 1995). Component 2 could therefore date as early as 5,500 BP and extend to ca. 2,000/2,500 BP.

Component 1 (6,000–7,500 BP). Three projectile points, two leaf–shaped lanceolate Cascade A and two Mahkin Shouldered variants were found 80 to 100 cm below surface. As indicated above, both point types are noted in late Cascade Phase components in the middle and north Columbia plateau (Campbell 1985; Chatters 1986; Lohse 1995). Projectile point temporal associations and two radiocarbon estimates bracketing ca. 7,000–7,500 BP date this component.

The Microblade Industry. Evidence for a microblade industry is present throughout the cultural deposits at DiRa–09. The total number of microcores was 36 with 22 cryptocrystalline silicates and 14 quartz crystal specimens. All microblades numbered 2,060; making it the largest single–site microblade assemblage in British Columbia. Descriptions are as follows:

Quartz Crystal Microcores

Component 1

N = 14

Microblade cores conform to those of the Plateau Microblade Tradition (cf. Sanger 1970a), with the exception of 14 quartz crystal specimens. To date, quartz crystal microblade cores have only been recorded in south coastal sites with the farthest inland specimens originating downstream in the Fraser Canyon near Yale, B.C. These 14 specimens from DiRa–09 are the first recorded instance of quartz crystal microblade cores and microblades in the Plateau culture area. Random occurrences of quartz crystals are found in some Plateau sites, specifically at

Kettle Falls (Chance and Chance 1985) and Savona (Bussey 1995), but not generally as microcores.

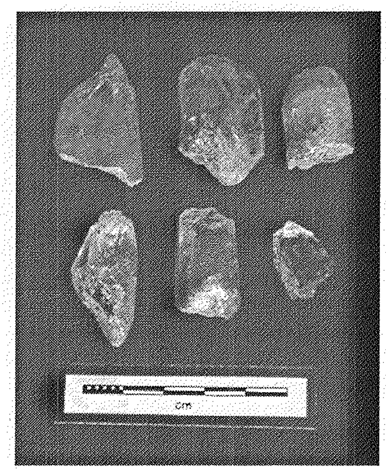

Figure 8.6: Quartz Crytal Microcores

The raw material for these cores is the natural six–sided crystal that can be found locally, although it is rare. These crystals range from translucent to milky opacity and from relatively complete specimens to chunky shatter fragments. All exhibit evidence of flaking and/or bipolar reduction. Microcores have a maximum width measured across two facets of 14–28 mm. Maximum lengths range from 15–31 mm.

It is difficult to measure the maximum length of microblades removed due to the damaged nature of the cores. It would appear that the reduction sequence involved a bipolar technique, observable by crushing and battering of the distal end of most crystals. Proximal ends would normally be represented by the intersection of six sides merging to a point. It is from this apex conjunction of six planes that microblades were struck. One or more of these convergent planes was struck at an angle to the parallel facets of the core body. This resulted in the removal of a microblade or small linear flake at a transverse angle across the parallel core side.

This method appears to differ from those observed in coastal sites where microblade removal followed the parallel plane of the core sides, although at least one DiRa–09 core fragment shows nearly parallel microblade removal along the face of a single facet. The number of successful microblade removals per core ranged from a low of 1 to a maximum of four. Quartz crystal microblades recovered numbered 120. Table A3 illustrates the distribution of microblades of all types per 10 cm level. Numbers reflect complete and broken microblades.

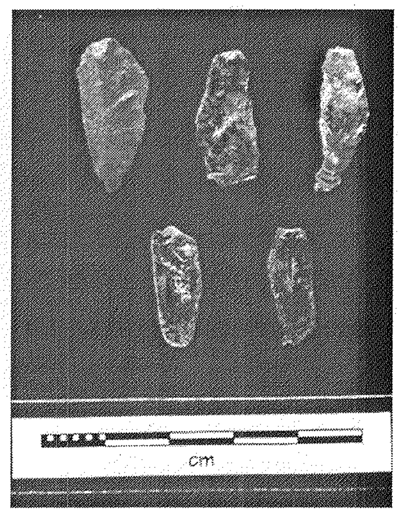

Figure 8.7: Quartz Crystal Microblades

Table A.3: Microblade Distribution by Arbitrary Levels (Raw Count Data)

Level	Total	Non–QC	QC
1	56	55	1
2	98	96	2
3	322	312	10
4	389	369	20
5	271	260	11
6	264	249	15
7	267	243	24
8	248	224	24
9	137	125	12
10	8	7	1
Totals:	**2,060**	**1,940**	**120**

A ratio of 8.6 microblades per core is derived if it is assumed that all quartz crystal microblades recovered were struck from only 14 cores and that no cores or microblades are missing from the assemblage. However, the fact that many cores and microblades were probably curated and/or used away from the site suggests that core/microblade figures may be misleading.

As opposed to the distribution of quartz crystal cores, crystal microblade (complete, proximal, distal and medial sections) distribution shows only 10.8% (N = 13) of all such microblades occurring in levels 1 to 3 of the site. Instead, almost 90% of quartz crystal microblades occur in level 4 to level 10, with 51% distributed in levels 7–10. This could indicate a decline in quartz crystal microblade use in components 3 and 4, or mixing of earlier component 2 materials.

That the available quartz crystal microcores exhibited only one to four microblade removals may indicate individual core lack of suitability, loss, discard or some other cultural factor and may not accurately reflect microcore efficiency. On the other hand, the relative rarity (6%) of quartz crystal microblades compared to other materials may be an indication that they were used for purposes other than those for basalts and cryptocrystalline silicates.

Plateau Microblade Tradition Cores

N = 22

chert

The microcore sample from DiRa–09 represents all stages of the core manufacture and reduction. Preform cores not exhibiting microblade removal are represented, as are complete, broken and exhausted cores. Core rejuvenation flakes were also recovered.

Twenty–two complete, or broken, microblade cores were manufactured from wedge–shaped preforms. Tabular, wedge–shaped core preforms (described below) were manufactured or selected from natural deposits that exhibited a surface (proximal) flat surface from which core preparation flakes and blades were struck. The 22 cores recovered exhibit all stages of the core and microblade reduction sequence – from single microblade removal to exhausted cores.

Core preparation included the use of tabular, cobble or pebble raw materials. All were reduced with the intention of forming wedge–shaped core performs exhibiting a flat striking platform. Striking platforms may exhibit naturally weathered surfaces or patinas. This reduction strategy conforms to the Platform–first (P1) system described by Morlan (1970) and utilized by Magne (1996) in analyses of Coastal and Interior microcores. Wedge–shaped performs were bifacially modified to form lateral core faces, but not with the intent of producing true "bifaces". The microcores exhibit bifacial edge modification to accentuate the desired wedge shape.

Microblade removal began after the removal of several flakes from the primary core face. These flakes were removed in order to form a ridge that would become the ventral surface of the first microblade ridge or *lame à crête* flake. Successive removal of microblades depended upon the arris remaining on the core face after each removal. All microcores exhibit removal of flakes from the primary core face, with some showing continued removal along lateral faces. No microcores exhibit removal from more than three faces.

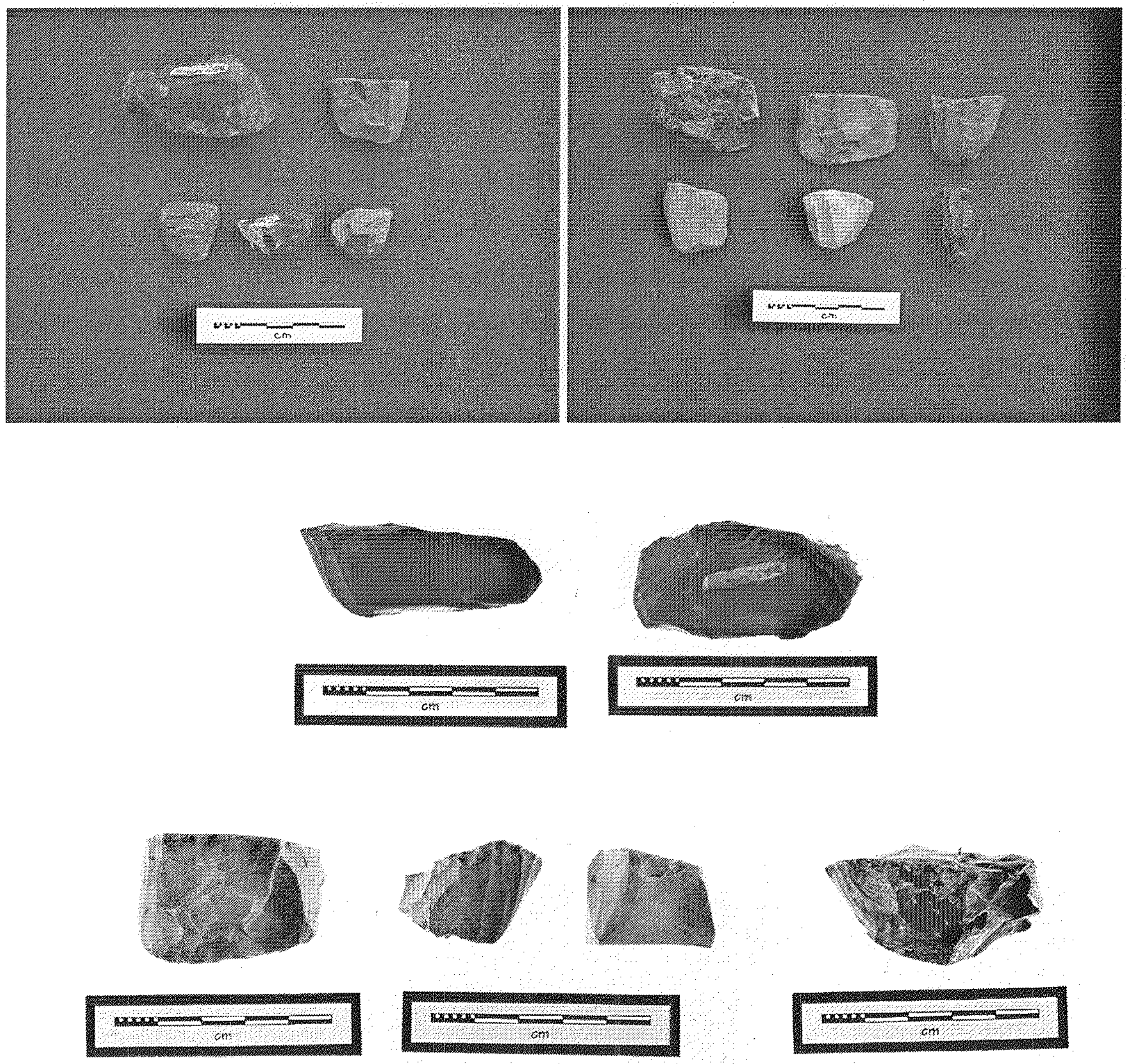

Figure 8.8: PMt Microcores

Microcore keels may exhibit battering. This was most likely the result of these cores being placed on an anvil stone. Others may have been placed on softer substances such as wood, or were reduced from a hand–held position.

Microcore face rejuvenation was accomplished by the removal of a single rejuvenation flake by a blow to the striking platform. In this manner, the entire surface of the previous core face was removed, the striking platform reformed and blade–like flakes struck preparatory to removal of additional microblades. This technology is distinctly different from core tablet removal strategies of the Eastern Siberian Dyuktai Tradition (Flenniken 1987) and those of the Denali andCampus–style core tablets (Clark and Gotthardt 1999; Mobley 1991) of northwestern subarctic North America.

Complete and broken microcores exhibit flake scars indicating successful removal of microblades. They range from the smallest at 18 x 23 x 23 mm, with a chord length of 35 mm. and six microblade removals, to the largest at 57 x 32 x 22 mm, with a chord length of 102 mm and 14 microblade removals. This largest microcore is also the best formed, although it was a surface find. Chord length measurements on this specimen are deceiving as there is evidence of the removal of non–microblade size flakes from opposite lateral margins. The presence of these flake scars has been incorporated into this measurement since core–rejuvenation flakes also have been recovered in this assemblage.

The number of final microblade removals per core prior to discard or disuse range from a low of 1 to a high of 14. Chord lengths vary from a low of 26 mm to a height of 102 mm. There was no direct correlation among core size, number of microblade removals and chord length. The 1,940 microblades of 22 complete cores recovered provides a ratio of 88 microblades per core. However, two microcores were surface finds. Removing them produces a ratio of 97 microblades per core. As per the discussion of quartz crystal microcores, it cannot be assumed that all microcores or microblades produced at the site were recovered. It would appear more likely to assume that the site functioned as a manufacturing area for microblades, which were then inset into composite tools and used off–site.

Microcore Preforms

N = 13
basalt (1), chert (12)

These 13 wedge–shaped core preforms were found only in levels 3,4,6,7,8 and 9 (30–90 cm below surface). Although there is no direct evidence of microblade production on any preform, the size and wedge–shaped configuration of these artifacts strongly indicates an initial selection and modification for microcore production. All are wedge–shaped, with core surface striking platforms represented by natural flat cleavage planes or by flake scars as indicated by negative bulbs of percussion. Size ranges are from 28 x 18 x 12 mm for the smallest specimen, to 67 x 47 x 41 mm for the largest. All measurements derive from the striking platform area.

Table A4 indicates the vertical distribution of performs. Note the absence of performs in Levels 1, 2 and 5. All were manufactured of cryptocrystalline silicates, the single basalt specimen derived from level 8 (80–90 cm below surface).

Table A.4: Vertical Distribution/10 cm. Level – Micorcore Preforms

Level	N
1	0
2	0
3	1
4	5
5	0
6	2
7	2
8	2
9	1

Microblade Core Rejuvenation Flakes
N = 23
Basalt (4), Chert (19)

A number of microblade core fragments ranging from core lateral edge rejuvenation flakes which exhibit microblade removal flake scars to pieces of wedge–shaped core striking platform remnants were recovered. Sizes range from 20 x 16 x 5 mm to 55 x 29 x 16 mm. All exhibit at least one microblade removal scar on a dorsal surface. The maximum number of microblade removal scars is five.

All specimens derived from levels as indicated in Table A5:

Table A.5: Vertical Distribtion/10 cm Level: Microcore rejunation flakes

Level	N
1	0
2	3
3	1
4	6
5	2
6	1
7	5
8	5
9	0

The four basalt specimens derive from level 4 (N = 1), level 7 (N = 1) and level 8 (N = 2).

Plateau microblades
N = 668 complete (MB–AA)
432 proximal sections (MB–PR)
264 distal sections (MB–DS)
696 medial sections (MB–SH)
2,060 total

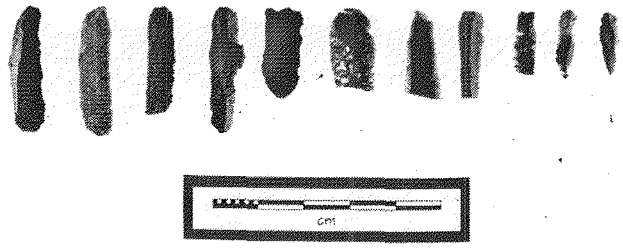

Figure 8.9: PMt Microblades

Complete microblades and fragments represent the largest single artifact type in the site. Quartz crystal microblades have been included in this total. Representing a total of 2,060 of 2,217 artifacts, these account for approximately 93% of the diagnostic cultural materials. Complete microblades represent 32% of all those found. They range in size from 4 to 35 mm. in length and 3 to 15 mm. in width (See Table A6) and are comparable to ranges of microblade removals on the cores, although core removal scars tend to be at least 1 mm. smaller in width. Microblades at the wider end of this range represent core preparation reduction strategies as the majority of complete microblades exhibit maximum widths of less than 10 mm. Microblade proximal sections are 21%, distal sections 13% and medial sections are 34% of this total. Complete microblades and proximal sections represent a combined total of 1,100 specimens or 53% of the sample. Basalts total approximately 22% of all microblades, while cryptocrystalline silicates 72% and quartz crystal are represented by 6%.

Table A.6: Microblade Length and Width Ranges
(Sample derived from Units 5 and 6)

Level:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
L(min)	7	9	7	4	6	108	8	8	*	*
L(max)	15	21	25	35	34	30	28	24	31	9
W(min)	4	3	4	4	4	4	4	6	*	*
W(max)	7	7	12	11	12	13	10	15	5	0
	*	denotes single specimen								

Table A.7 illustrates the vertical distribution of basalt and crysptocrystalline silicate micocores, microblades and fragments.

Table A.7: Microblade Stratigraphic Distribution by 10 cm Level (Column Percentages)

Key:
CRJ core flute face rejuvenation flake
PR core preform
AA complete microblade
PR proximal section of microblade (missing distal end)
DS distal section of microblade
SH medial section of microblade (lacks proximal and distal ends)

Level	cores	PR	CRJ	AA	PR	DS	SH
1	5			3	5	3	2
2	9		9	8	3	8	2
3	14	8	4	8	16	12	31
4	18	39	26	18	24	20	2
5	9		9	16	9	14	15
6	9	15	4	17	5	9	18
7	27	15	22	13	9	16	15
8	5	15	22	12	16	9	11
9		8		6	11	8	5
10	5			0.1	1		0.5
%	100	100	100	100	100	100	100

From the above it can be seen that most microcores, preforms and core rejuvenation flakes were found from 20 to 100 cm below surface. Over 25% were located in levels 3 and 4 (30–40 cm below surface) with most of the remainder found between levels 5 and 8 (60 to 80 cm below surface).

There is a relatively equal distribution of microblades between levels 5 and 8 (50 to 80 cm below surface) where frequency of microblade occurrence totals 58, 39, 48 and 59 percent by microblade class (AA, PR, DS and SH) respectively. Levels 3 and 4 displayed frequencies of 26, 40, 32 and 33 percent respectively. Levels 1 and 2 show percentages of 11, 8, 11 and 4 respectively and levels 9 and 10 exhibit 6.1, 12, 8 and 5.5 percent respectively. Although there has undoubtedly been mixing of the cultural strata, the differences in frequencies of microblades suggest an amalgam of intermittent occupations occurred over a period of about six millennia. Excavation strategies utilized preclude identification of discrete occupation events.

That microblades were present as complete, proximal, distal and medial sections probably are an indication of breakage patterns resulting from manufacture and/or use. No attempt was made to match broken microblade sections although this would have provided better information with regard to manufacture and use.

A lack of evidence for retouch on any microblades, other than discontinuous damage most likely resulting from post–depositional factors, strongly suggests that microblade usage of all types occurred away from the camp. Microblade snapping is indicated by the presence of single, lateral "microburin" notches on some specimens.

The microburin technique allows removal of the proximal end by snapping. The removal of the bulb of percussion then facilitated hafting of the remaining section of the microblade. As such, composite tools incorporating microblades may have been used primarily in off–site locations. However, it is possible that single lateral notches near the proximal end of microblades could be the result of manufacturing. This remains to be tested.

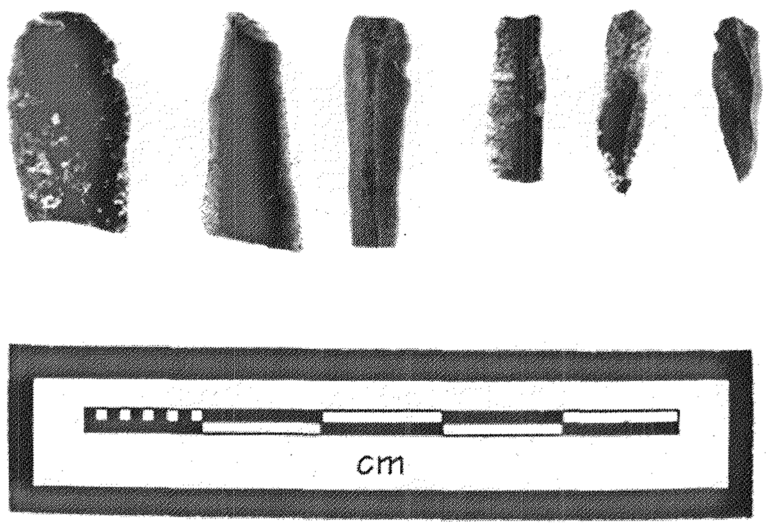

Figure 8.10: The Microburin (proximal–lateral notching) Technique

Microblade Industry: Vertical and Horizontal Distributions. Microblades and microcore distributions were examined in order to determine the nature of horizontal and vertical inter–assemblage variability and component definition. They were separated into two classes based upon raw material: 1) the quartz crystal and 2) cryptocrystalline silicate and basalt microblade and microcore sub–assemblages.

Quartz Crystal Microblade Industry. Quartz crystal microblade cores are horizontally concentrated in units 4 through 6, represented by 12 of 14 in situ cores (86%). Stratigraphically, quartz crystal cores are found in levels 6 through 10 (50–100 cm below surface) with 10 of 14 (80%) in levels 6 to 8. Two were located between 80–100 cm below surface and one each in levels 9 and 10. These numbers reflect definite horizontal and vertical patterning oriented towards the earlier cultural deposits at the eastern end of the main excavation area. Quartz crystal cores (N = 2) were also located in level 4 of unit 4, indicating the presence of this technology in the later component. Quartz crystal microblades were horizontally patterned:

Table A.8: Horizontal Distribution, Quartz Crystal Micoblades/Unit (%)

Unit:	**6**	**3**	**1**
	16	06	27
	03	03	31
	5	**4**	**2**

Eighty percent (80%) of all quartz crystal microblades derive from levels 5 to 10, with less than 1% found in level 10. Levels 3 and 4 account for 19% wheras levels 1 and 2 account for the remaining 1%. These figures support the evidence of micocore vertical distribution that the majority of quartz crystal microblades were being produced in levels 5 to 9 (40 to 90 cm below surface).

The horizontal distribution of quartz crystal microcores is at variance with that of the microblades – with most of the microblades being located in units 1, 2 and 6 whereas cores were found in units 4, 5 and 6. This suggests that quartz crystal microblades were detached, then probably utilized or made into composite tools within the confines of this rather small area.

Non–quartz Crystal Microcore Distribution. Microcores excavated in situ numbered 18. Two were recovered as surface finds while two lack unit or level provenience, and are not included in the analysis. Microcore horizontal patterning is evident, with the highest numbers being recovered from units at opposite ends of the major excavation area – six each in units 1 and 6, followed by units 2 and 3 with two each, and one core in each of units 4 and 5. Vertical distribution shows 11 of 18 cores (61%) in levels 5 to 8 (40–90 cm below surface), followed by 6 of 18 (33%) in levels 3 and 4 (20–40 cm below surface). Non–quartz crystal microblade distributions are illustrated in Table A.9.

From Table A.7 it can be seen that the highest concentration of microblades occurs in units 5 and 6 (easternmost units) and levels 3 and 4, representing 4.5–6.3% of the main excavation area microblade industry. The second highest frequencies are in units 1 and 2 at levels 4,5,6 and 8 with relative percentages of 3.0–3.6 of the microblade sub–assemblage. The third level of distribution is in units 2 through 6, at levels 4 through 8 with percentages falling between 2.0 and 2.9%. The fourth level can be seen in all units with values between 1.0 and 2.0%. Values lower than 1% occur in all units within the first and last two levels.

Table A.9: Non–quartz Crystal Microblade Distribution (Percentages)

Unit	Level 1	2	3	4	5	6	7	8	9	10	%
1	0.7	0.6	1.0	1.8	3.0	1.9	2.4	3.6	1.5	0.1	**16.6**
2	0.3	0.5	1.1	3.2	2.5	3.1	1.9	2.0	1.4	0.1	**16.1**
3	0.5	0.5	1.4	1.3	1.2	2.0	2.2	2.3	1.4	0.0	**12.8**
4	0.1	1.2	1.8	2.3	1.6	2.9	2.1	2.6	0.6	0.1	**15.3**
5	0.8	1.0	1.4	4.5	2.8	1.2	2.7	0.9	0.7	0.1	**15.9**
6	0.5	1.0	4.4	6.3	2.6	2.9	2.1	2.2	1.3	0.0	**23.4**
%	**2.8**	**4.6**	**11.1**	**19.3**	**13.7**	**14.0**	**13.4**	**13.6**	**6.8**	**0.5**	

This can be interpreted as a more intensive concentration of microblade–related activities having occurred in units 5 and 6 between levels 3–4 (20 to 40 cm below surface) representing 30.4% of microblades, with another, somewhat less intensive concentration in units 1 and 2 between levels 5–8 (40–80 cm below surface) represented by 60.5% of the microblade sub–assemblage. Both patterns suggest that these were areas of the site, horizontally and vertically, which primarily were associated with microblade production, use or storage. It also suggests a temporal dichotomy between levels 3 and 4 (30–40 cm below surface) and between levels 5 to 9 (40 to 90 cm below surface) in terms of separate components. Levels 1 and 2 (surface to 20 cm below surface) represent the most recent occupations and include historic disturbance as a mixed component. These figures support the hypothesis that three components are represented and that activities relating to microblade manufacture (composite tools and cordage manufacture (?) were mainstays of activities conducted on–site over six millennia.

Faunal Remains. Faunal remains from the Stirling Creek site consisted primarily of small quantities of broken and smashed ungulate diaphyses, Artiodactyl (deer/sheep/goat/ antelope) teeth and post–cranial elements and single elements of bear, bird and fish taxa (See Table A.10). Table A.9 lists the identified faunal elements by taxon, or by decreasing probability of taxon, as well as skeletal element, state of preservation, and arbitrary 10 cm excavation level.

Evidence of cooking is suggested by frequent spiral and impact fractures on medium to large animal bones. Paul Ewonus (1999) identified the faunal remains, a summary of which is provided below.

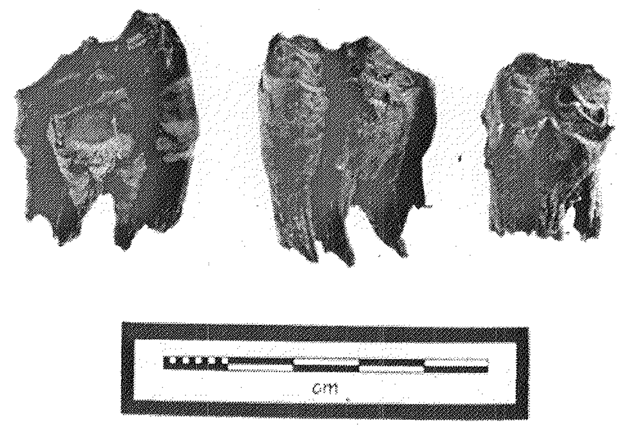

Figure 8.11: Bighorn Sheep Teeth

Table A.10: Identifiable Fauna Sterling Creek (DiRa–09) by Taxon

Unit/Lvl	Taxa	Element	Complete	Side	WS	Comments	Lvl
	Mammalia:						
4C1/8	Large mammal	diaphysis	fragment		WS2	spiral & impact fractures	8
3D3/1	medium mammal	diaphysis	fragment		WS1	spiral fractures	1
3D1–2/9	medium mammal	diaphysis			WS1	impact fracture, rodent gnaw	9
3D1–2/9	medium mammal	diaphysis	2 fragments		WS1	impact & spiral fractures, rodent gnaw	9
1A4/3	medium to large mammal	diaphysis	fragment		WS1	cut marks, spiral–impact fractures	3
Unit/Lvl	Taxa	Element	Complete	Side	WS	Comments	Lvl
1A4/3	medium to large mammal	diaphysis	fragment		WS1	spiral fractures, rodent gnaw	3
3D1–2/9	medium to large mammal	diaphysis	3 fragments		WS1	cut marks, spiral & impact fractures	9
2D1/3	Mammal	tooth	enamel frag				3
2A2/4	Mammal	tooth	fragment				4
2D1/4	Mammal	tooth	enamel frag				4
5A2/5	Mammal	tooth	enamel frag				5
1A2/5	Mammal	tooth	enamel frag				5
1A4/5	Mammal	tooth	enamel frag				5
1D2/5	Mammal	tooth	enamel frag				5
1A3/5	Mammal	diaphysis	fragment			flake	5
3A3/6	Mammal	tooth	root fragment				6
	Rodentia:						
5A3/2	rodent/Lagomorph/ small carnivore	diaphysis or rib	fragment		WS2	Feature #1	2
1D1/3	large rodent	tooth	incisor frag				3

Unit/Lvl	Taxa	Element	Complete	Side	WS	Comments	Lvl
6A2/8	large rodent	tooth	plus socket				8
	Carnivora:						
1C2/3	**Ursus**	metapodial	diaphysis		WS1	eroded epiphysis	3
1A1/3	Carnivore	Scapula	glenoid fossa		WS1		3
	Artiodactyla:						
4B4/1 & 5A3/1–2	Artiodactyl	metacarpal	fragment, proximal		WS1	Feature #1	2
4B4/1 & 5A3/1–2	Artiodactyl	rib	fragment		WS1	rodent gnaw, Feature #1	2
4B4/1 & 5A3/1–2	Artiodactyl	rib	fragment		WS1	rodent gnaw, Feature #1	2
1A1/3	Artiodactyl	Incisor	fragment			enamel exfoliation	3
5C3/6	Artiodactyl	tooth	fragments		WS3		6
4C2/8	Artiodactyl	tooth	root fragment				8
3D3/9	Artiodactyl	Axis	ventral 1/3 and centrum	axial	WS3	burnt	9
3B2/9	Artiodactyl	Scapula	spine fragment	right	WS2		9
2D1/9	Artiodactyl	calcanium	fragment	left	WS2		9
4B4/1 & 5A3/1–2	**Odocoileus**	upper molar	90%			Feature #1	2
4B4/1 & 5A3/1–2	**Odocoileus**	upper molar	90%			Feature #1	2
4B4/1 & 5A3/1–2	**Odocoileus**	upper molar	90%			Feature #1	2
4B4/1 & 5A3/1–2	**Odocoileus**	upper molar	90%			Feature #1	2
4B4/1 & 5A3/1–2	**Odocoileus**	upper molar	complete			enamel exfoliation, Feature #1	2
2C4/4	**Odocoileus**	molar	90%			enamel exfoliation	4
6B1/8	**Odocoileus**	ulna	proximal epiphysis	left	WS2		8
4B4/1 & 5A3/1–2	Odocoileus/Ovis/ Oreamnos	mandible, coronoid process	fragment	left	WS1	rodent gnaw, Feature #1	2
2D3/4	Odocoileus/Ovis/ Oreamnos/ Antilocapra	astralagus	anterior 1/2	left	WS2	cut marks	4
5C3/7	Odocoileus/Ovis/ Oreamnos/ Antilocapra	metacarpal	proximal–lateral fragment	right	WS1	root etching split long. serrated fracture	7
2D2/8	Odocoileus/Ovis/ Oreamnos/ Antilocapra	scapula	spine fragment	left	WS1	root etching	8
5C3/8	Odocoileus/Ovis/ Antilocapra	astralagus	complete	left	WS2		8
6B2/2	**Cervus**	premolar #2	complete	right		small individual	2
2D1/4	**Cervus**	fibula	lateral malleolus	left	WS3		4
2D4/8	Oreamnos/Ovis	molar, lower	complete			enamel exfoliation	8

Unit/Lvl	Taxa	Element	Complete	Side	WS	Comments	Lvl
		atlas		axial	WS2	anterior, left	3
	Ovis/Oreamnos	Incisor	complete			enamel exfoliation	3
1A1/3	Ovis/Oreamnos	Incisor	complete			enamel exfoliation	3
1A1/3	Ovis/Oreamnos	Incisor	complete			enamel exfoliation	3
1A1/3	Ovis/Oreamnos	Incisor	complete			enamel exfoliation	3
1A1/3	Ovis/Oreamnos	Incisor	complete			enamel exfoliation	3
5C3/6	Ovis/Oreamnos	mandible, ramus	fragment	right	WS2	cut marks, Feature #3	6
5C3/6	Ovis/Oreamnos	molar				enamel exfoliation, Feature #3	6
5C3/6	Ovis/Oreamnos	molar				enamel exfoliation, Feature #3	6
5C3/6	Ovis/Oreamnos	molar				enamel exfoliation, Feature #3	6
5C3/6	Ovis/Oreamnos	premolar				enamel exfoliation, Feature #3	6
5C3/6	Ovis/Oreamnos	premolar				enamel exfoliation, Feature #3	6
1C3/8	Ovis/Oreamnos	molar	complete			enamel exfoliation	8
2D4/9	Ovis/Oreamnod	molar	complete				9
Unit/Lvl	Taxa	Element	Complete	Side	WS	Comments	Lvl
3D4/9	**Ovis/Odocoileus/ Antilocapra**	Astralagus	complete	left	WS2	trowel damage	9
4B4/1 & 5A3/1–2	Ovis/Oreamnos/ Antilocapra	humerus	Distal	right	WS1	cut marks, spiral fractures, rodent gnaw	2
3D1/8	Ovis/Oreamnos/ Antilocapra	molar	90%				8
	Avifauna:						
1A3/5	Bird	bone	fragment		WS1		5
	Piscea:						
3D1/4	fish	bone	fragment		WS1		4

A summary of identified taxa derived from this is presented in Table A.11.

Table A.11: Identified Number of Taxa Specimens Per Arbitrary Level

			Totals		
Level	**Deer**	**Sheep/Goat**	**Artiodactyl**	**Rodent**	**Other ***
1	5	1	10	0	Bird, freshwater mussel, carnivore
2	0	0	1^{+}	0	Elk
3	0	8	13	2	Carnivore, bear
4	1	0	6	1	Fish, elk
5	0	0	4	0	Bird
6	0	6	7	0	Freshwater mussel
7	0	1	3	2	
8	1	5	13	1	
9	0	1	7	3	River otter
10	0	0	2	0	

* single example
\+ radiometric sample (after Ewonus 1999:88, table 10)

The pattern of faunal remains in table A.9 does little to aid component definition. Sediment and cultural material distributions suggest vertical distributions in the following units: levels 1 and 2; levels 3 and 4, levels 5 and 6; and levels 7 to 10. Radiometric estimates of ca. 6,900 BP and 7,400 BP in levels 7 and 9 respectively, and ca. 1,800 BP in level 2 support this. Levels 1 and 2 represent a mixed historical/late pre–contact component where deer predominates over sheep and/or goat. Levels 3 and 4 document an increased emphasis on sheep/goat, as do levels 5 and 6 and levels 7 to 10. This strongly indicates that hunting preferences were relatively stable from 7,400 BP to ca. 2,000 BP (or earlier) when the radiometric assays are taken into consideration. However, it should be emphasized that, due to the compacted nature of the anthropogenic sediments resulting from vehicular traffic to and from the ford located upstream of the site, occupation zones have become blended and difficult to determine.

The most striking pattern noted is the earlier prevalence of sheep/goat over deer. This is in contrast to the majority of Plateau sites and is an indication that these species were significant local bioresources from ca. 2,000 to 7,400 BP. Deer replaced sheep/goat in the mixed late/historic component, more typical of results of excavations elsewhere. Both sets of Artiodactyl are present in the modern valley, although sheep and goat may be less numerous than in times past. This could be a function of lack of wildfires in the montane regions, keeping meadows open. Bighorn sheep are present in nearby areas of the valley, but tend to keep to higher open meadows that are close to closed canopy forest or rocky outcrops. The high incidence of sheep remains suggests that sub–alpine and mid–elevation valley uplands consisted of more open canopy forest in the past.

Ewonus (1999: 88) noted that rodent remains cluster near component boundaries. He postulated that this pattern could indicate resource stress or non–subsistence procurement (quills, pelts, incisors) although the data are too scant to determine which.

Carnivore remains are few but still worth noting. The single element of a river otter in the earliest component (6,000 to 7,400 BP) indicates the presence of freshwater fish in the river. A single fish bone from the component dating ca. 1,500–2,500 BP was the only example preserved however. The otter may have been an opportunistic kill, or taken in a number of ways, including trapping, for its pelt and teeth. Bear remains show a similar distribution. This single metapodial by itself is not particularly diagnostic, but may represent elements of ritual behaviour. Oral traditions record that bear hunters were held in high esteem. A medium–sized carnivore, potentially identified as a coyote, was originally interpreted as subsistence foodstuffs (Ewonus

1999: 89) although more plausible explanations include non–occupation ecofact status or evidence of a pet.

Ewonus' analysis of the faunal assemblage concluded that

> (t)aphonomic analysis indicates meat filleting, bone marrow processing and grease extraction ...bighorn sheep was the focus of subsistence... activities ..., with deer rating clearly second, over the entire 7500 year sequence. Taxa of secondary importance included rodents, elk, freshwater mussels, fish and birds. Carnivores are also present ... their distribution suggests cultural patterning, although ... precise cause remains unknown. Changes in the distribution of carnivores and artiodactyls, as well as weathering stage and lithic data are used to refine the cultural sequence ... into three components. The dominance of bighorn sheep, and to a lesser extent deer, coupled with a number of other local resources present in much smaller numbers suggests ... residentially mobile forgers. The faunal assemblage (was) consulted for evidence of resource intensification and the result is ... negative. (Ewonus 1999: i).

The excavated deposits provided no evidence of storage features, such as cache pits, or other subsistence–related structures, such as earth ovens. Ewonus' assumption that the site was a residential field camp from which task–specific groups foraged appears as the most elegant explanation for the types of artifacts and features recovered. Given the constricted nature of the valley at this locale, it is suggested that the site was a field camp from which logistically–oriented forays for floral and faunal resources into the countryside originated. Although sediment samples were examined for botanical evidence, nothing of significance was discovered. The faunal assemblage of broken and fragmented ungulate bone, including teeth, suggests a foraging strategy in which game was brought back to camp and distributed according to a generalized system of reciprocity exercised through kinship ties.

Site Summary

Evidence presented in the previous sections indicates the existence of four cultural strata, albeit ones probably subject to some mixing:

Acnol'ux Phase (4,500–7,500 BP). An early Cascade Horizon is defined as the earliest occupation(s) found at depths greater than 70 cm below surface. Vertical transportation of component 1 materials explain the presence of limited numbers of artifacts and FAR between ca. 90 cm below surface and stratum 4 – a non–cultural terminal Pleistocene or early Holocene fluvial lag deposit. Associated radiocarbon estimates of 7,400 ± 90 and 6,920 ± 100 BP on culturally modified ungulate bone associated with FAR and artifacts provide an acceptable age for this component. Associated projectile points also indicate affiliation of this cultural unit (cf. Lohse 1995) with a regional addition of Plateau Microblade Tradition technologies. The termination of the early Cascade Horizon is generally agreed upon as marked by the occurrence of Mazama tephra (ca. 6,850–7,000 BP) (cf. Ames 2000d; Lohse 1995).

A later Cascade Horizon is defined by cultural materials ca. 50–60 cm below surface. They cannot be defined as a single, discrete occupation due to probable vertical and horizontal mixing of cultural materials through natural or human agencies. Diagnostic materials include a distinctive Cascade point manufactured of red chert exhibiting blade margin serrations. Points such as this were found in late Cascade Phase components at Judd Peaks North and South as well as Layser Cave (Daugherty et al. 1987a,b). The upper limit for this component is defined by an interface between arbitrary excavation levels 4 and 5 at 40–50 cm below surface. It is above this interface that an increase in cultural materials occurs – indicating a more intensive occupation and/or use of the site.

Snazai'st Phase (1,200–2,500 BP). Component 3 is defined by the presence of high frequencies/densities of fire–altered rock, debitage and diagnostic artifacts (projectile point Type 6 specimens) found ca. 25–30 cm below surface. Typologically similar, but not identical to point types from the Thompson and northern Columbia plateaus dating ca. 1,200–2,500/4,000 BP this projectile points and other component materials are associated with a radiocarbon estimate on culturally–modified ungulate bone of 1,810 ± 90 BP.

Component 4 is stratigraphically defined by the presence of historical artifacts of glass, ceramic and metal mixed with pre–contact artifacts and fire–altered rock to depths of ca. 15 cm below surface.

The Tcutcuwi'xa Rock Shelter (DhRa–02) Site

Limited information regarding the 1998 excavations of the Tcutcuwi'xa rock shelter can be made available due to a confidentiality agreement with the Upper Similkameen Indian Band. This agreement was intitiated due to Band concerns regarding sacred, spiritual concerns. The rock shelter contains several complex pictograph panels (Corner 1968) and it is considered a place of personal and community spiritual power. Ritual opening and closing (cleansing) ceremonies were conducted in the presence of elders. Cultural material excavated has been returned to the ground during a different ceremony. The Tcutcuwi'xa rock shelter is located on the Chuchuwayha Indian Reserve (IR #2). At the request of the Band, a heritage inspection permit from the B.C. Archaeology Branch was not obtained.

The site is located on the uppermost terrace of the early Holocene Similkameen River. It is a rock shelter formed by Pleistocene fluvial action measuring 8 by 30 meters. Detailed geomorphological analysis has not been conducted, at the request of the Band, but it would appear that the shelter formed by glacial scouring and water activities. Fluvial, aeolian, gravity wasting and slope wash has filled the rock shelter cavity with over two meters of sediments. Anthropogenic sediments were encountered to depths of 40 to 60 cms except in one unit where a pre–contact pit was excavated to two meters below surface.

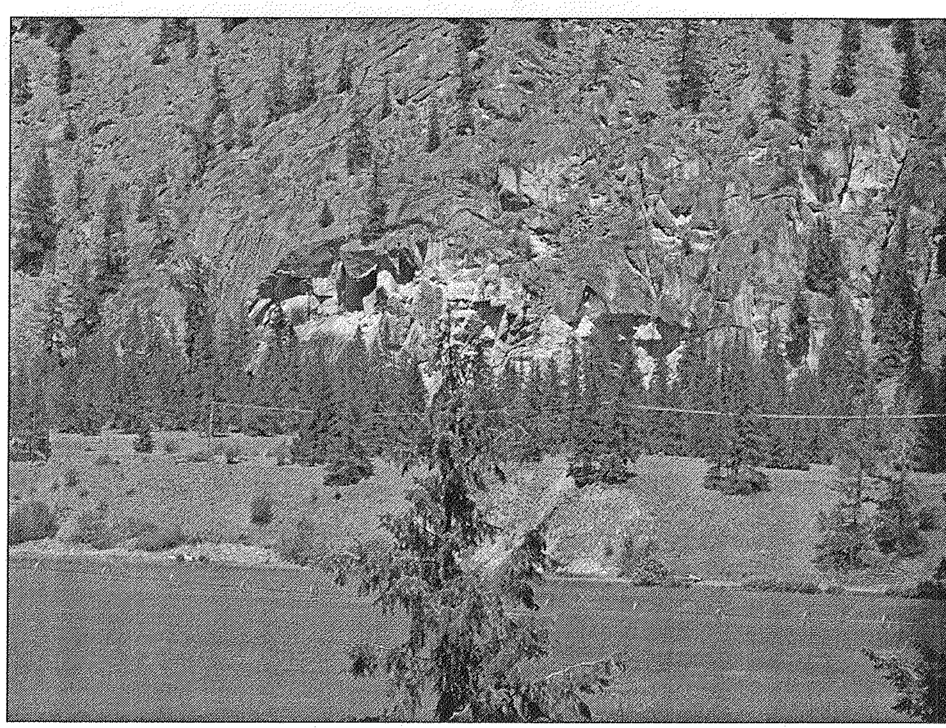

Figure 8.12: DhRa–02 Locality
Note: rockshelter is below bluffs in centre background beyond trees

Excavation Methodology. Five, one–meter square units were excavated in 10 cm arbitrary levels in contiguous units forming a trench extending from the wall of the shelter to a point outside the drip line. This ensured a continuous sediment profile against which future, more precise, excavations could be based. All sediments were passed through 1/8" wire mesh screen to ensure maximum recovery of small floral, faunal and artifact items. Systematic sediment samples were obtained from each unit. At the time of writing these have yet to be analyzed. One–meter square units were subdivided into 50 centimeter–square quadrats.

Cultural and Natural Stratigraphy. The 1998 excavations were conducted under severe time and financial constraints and were meant to provide information to guide later studies. One of five units was excavated to a depth of two meters below surface. This unit followed a pre–

contact pit excavated into otherwise culturally sterile deposits. The remaining units exhibited cultural strata to depths of 40 or 60 cm below surface.

Sediment ontogeny points to aeolian, gravity–wasting, and slope wash deposition over probable re–worked post–glacial till. Since excavations were not conducted to a sufficient depth to encounter early sediments, this remains conjecture. A distinct lens of St. Helens Yn tephra was encountered across all units, except where interrupted by historical or pre–contact post–fall excavations (Figure 8.13). Mount St. Helens Yn tephra was identified by Dr. Nicholas Foit (University of Washington). It has been reliably dated (Dr. N. Foit, personal communication 1999) to ca. 3,500 BP.

A small pit was observed excavated from the surface through the Mt. St. Helen's Yn ash in Unit C (Figure 8.13). Some bioturbation was observed through all cultural strata in the form of plant rootlets and beetle larvae tunnels. These did not appear to have unduly disturbed any of the strata as disturbance features measured 1 cm in diameter or less. Physical and chemical sediment analysis has yet to be conducted on these deposits as permission must be obtained from the elders, Chief and council of the Upper Similkameen Indian Band.

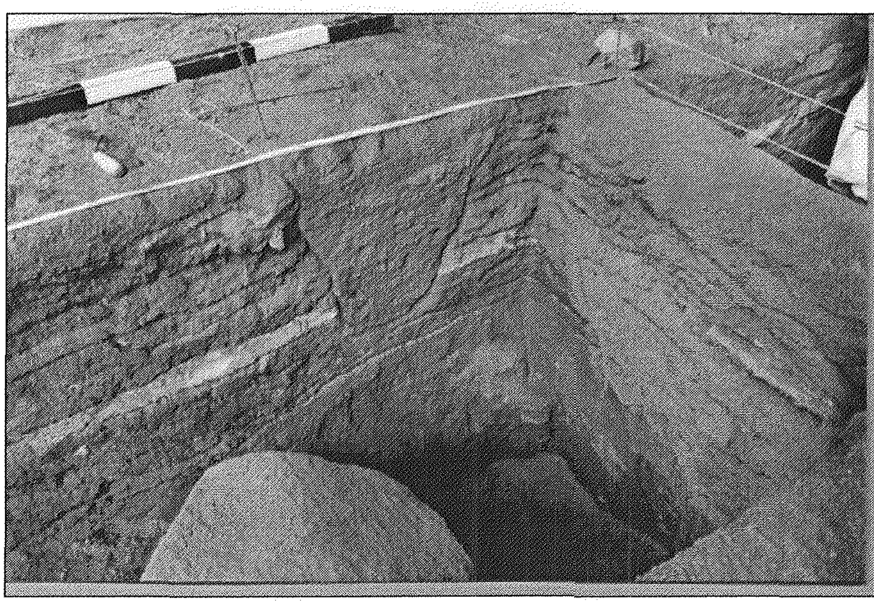

Figure 8.13: DhRa–20 Strata

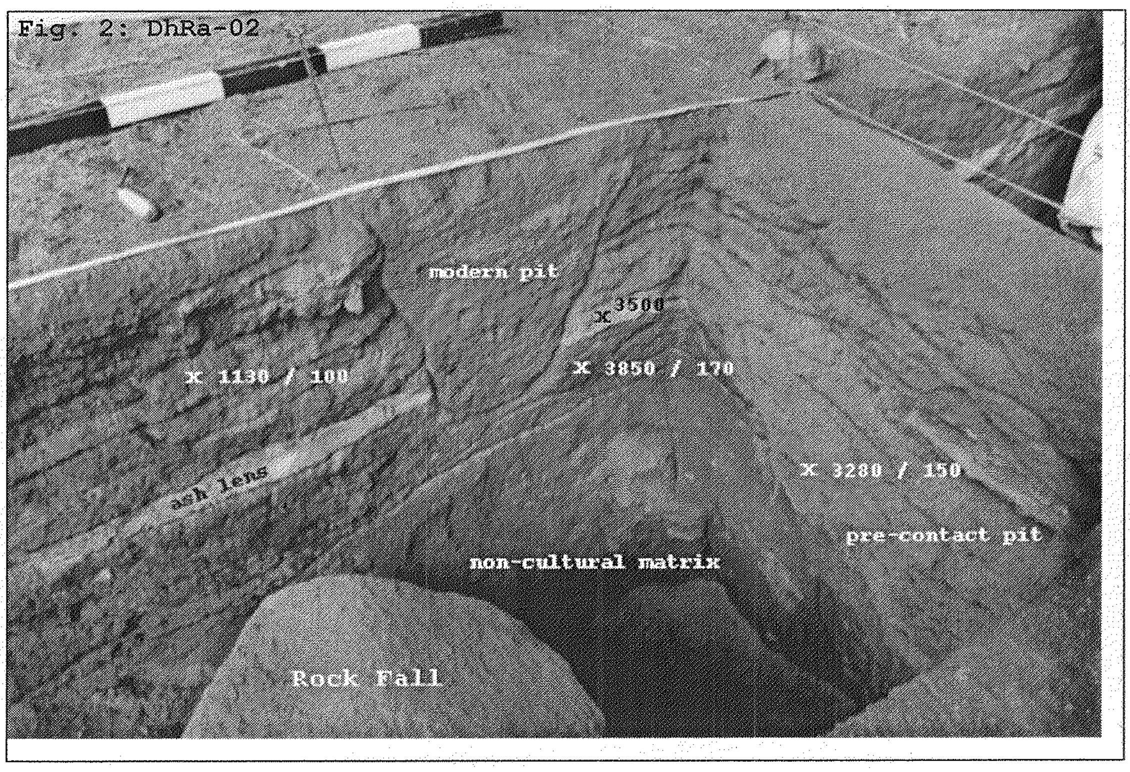

Figure 8.14: DhRa–02 Strata and Radiometric Assays

Diagnostic Artifacts. Diagnostic artifacts were few. They consisted of three complete diagnostic projectile points and one base fragment, an ovate biface, four rolled birch bark segments, a small unmodified quartz crystal and several tiny nodules of red ochre (Figure 8.15). An idiosyncratic corner notched projectile point was located stratigraphically between radiometric estimates of 1,130 ± 100 and 3,280 ± 150 BP. A similar point was recovered by Sanger (1970: 103) in upper cultural strata at the Lochnore Creek site (EdRk–7 Zone 1). The strata provided five radiometric assays that fit well with those of the DhRa–02 specimen: 1,610 ± 140; 2,605 ± 140; 2,670 ± 130; 2,680 ± 100; 3,230 ± 90 and 3280 ± 125 BP.

The single leaf–shaped projectile point was located in the lower cultural stratum of the rock shelter associated with a radiometric estimate of 3,580 ± 170 BP. Two cryptocrystalline silicate microblades as well as a small triangular projectile point preform were recovered as surface finds near the drip line. Debitage consisted primarily of basalts or dacites and represented later stages of reduction. No cores were found.

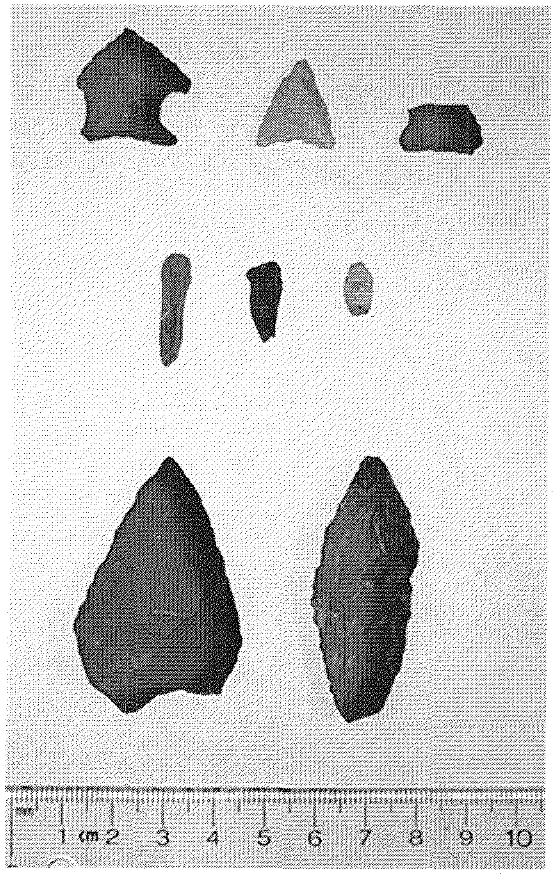

Figure 8.15: DhRa–02 Lithic Artifacts

Key:

Top row: Corner–notched point (atypical); small side–notched point perform, small side–notched point base
Middle: microblades
Bottom: biface; Cascade point

Except for the eight artifacts illustrated above, all other cultural materials were re–buried in the rock shelter without benefit of analysis as a condition of research.

Radiocarbon Assays. Three radiocarbon assays were conducted on cultural ungulate bone. All three samples were Artiodactyl (sheep or goat):

Sample #1: **1,130 ± 100 BP** (NUTA6677)

Cal BP 953–1,148 @ 1 sd (0.947 probability)

Cal AD 802–996 @ 1 sd (0.947 probability)

Sample #1 was located stratigraphically above the Mt. St. Helen's Yn tephra (Plates A12, A13).

Sample #2: **3,280 ± 150 BP** (NUTA6726)

Cal BP 3,347–3,692 @ 1 sd (1.000 probability)

Cal BC 1743–1398 @ 1 sd (1.000 probability)

Sample #2 was located in a pre–contact pit excavated through the Mt. St. Helen's Yn tephra.

Sample #3: 3,580 ± 170 BP (NUTA6727)

Cal BP 3,683–4,091 @ 1 sd (0.930 probability)

Cal BC 2142–1734 @ 1 sd (0.930 probability)

Sample #3 derived from intact cultural deposits stratigraphically below an intact lens of the ca. 3,500 BP Mt. St. Helen's Yn tephra (see PlateA.13).

Component Definition. The following pre–contact components were identified:

Sxwalhani.t Phase (200–1,500 BP). Cultural strata located above and below radiocarbon assay 1,130 ± 100 BP, although lacking in diagnostic artifacts, is assigned to the pre–contact Sxwalhani.t Phase. The single small triangular projectile point, possibly a small side–notched point preform, red ochre fragments probably associated with the pictographs on shelter walls, and preserved rolls of birch bark are all indicative of sporadic use within the last 1,500 years.

Snazai'st Phase (1,500–2,500 BP). Although strata below the 1,130 ± 100 BP to the 3,500–year old Mt. St. Helen's Yn tephra lens are few, they do exist. Three diagnostic artifacts were recovered in these few strata, but they are sandwiched between the 1,100–year old assay and one dating 3,280 ± 150 BP. Both are complete cryptocrystaline silicate microblades, but no microcores were recovered. This is sufficient to indicate sporadic use between ca. 1,500 to 2,500 BP.

Tcutcuwi'xa Phase (2,500–4,500 BP). As with preceeding strata, evidence for 2,500 to 4,500–year use can be seen in strata superior to the tephra lens, the pre–contact pit that cut through it, and intact strata below. In addition, the radiocarbon estimate of 3,580 ± 170 BP supports earlier sporadic use of the site. The single diagnostic artifact recovered was the leaf shaped projectile point.

The relatively low density of artifacts, fire–altered rock and other cultural materials indicates that the rock shelter served a function other than that of a field or logistical camp. Sites in similar settings such as Judd Peak and Layser Caves (Daugherty 1987a, b) exhibited much higher densities of artifacts associated with hunting and floral/faunal processing, especially projectile points and microblades. The association of low–density cultural materials and red ochre suggests that the rock shelter served a ceremonial or sacred function for at least 4,000 years. This confirms Upper Similkameen Band elders' concerns for the site, no doubt stimulated by oral traditions. Such sensitive oral traditions are often communicated outside of the Aboriginal community.

The Snazai'st Village (DiRa–20) Site

The Snazai'st Village site (DiRa–20) was recorded in Teit (1930). Elder Harry Robinson (cited in Hudson 1986) considered it part of the larger settlement known as Chuchuwayha, an important village occupied during the 1860s (Allison 1976) (see Chapter 3).

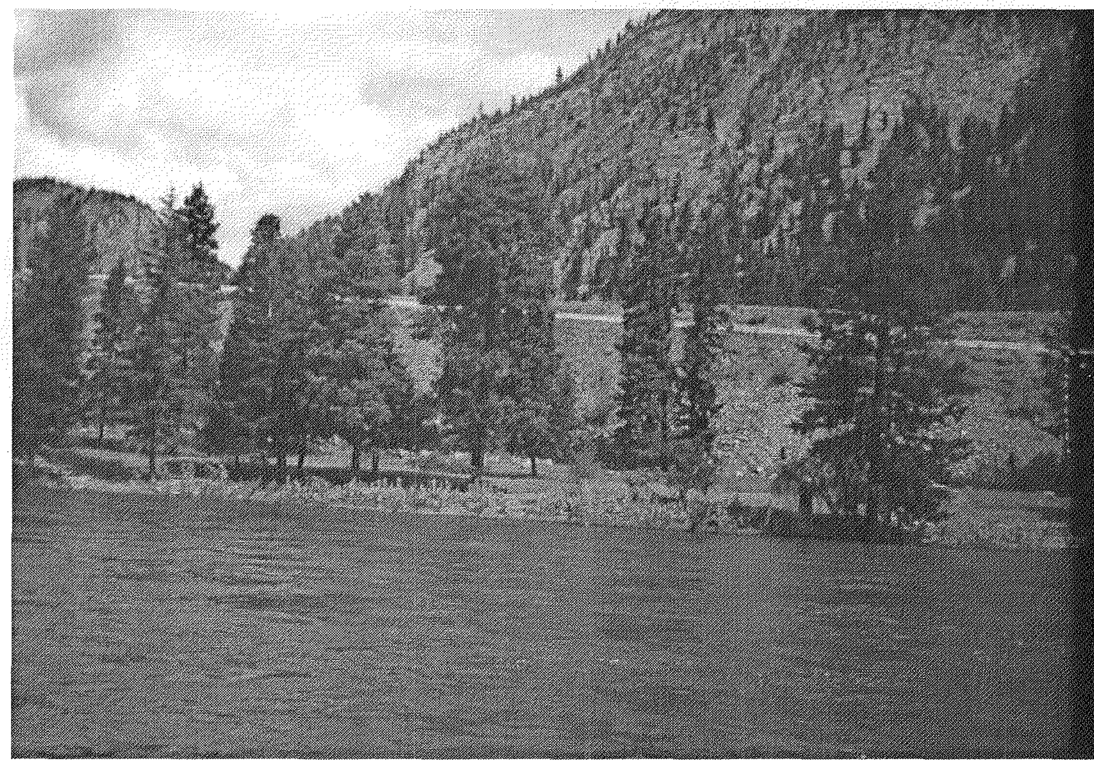

Figure 8.16: DiRa–20 Locality
Note: Site is located on river terrace (foreground) below highway

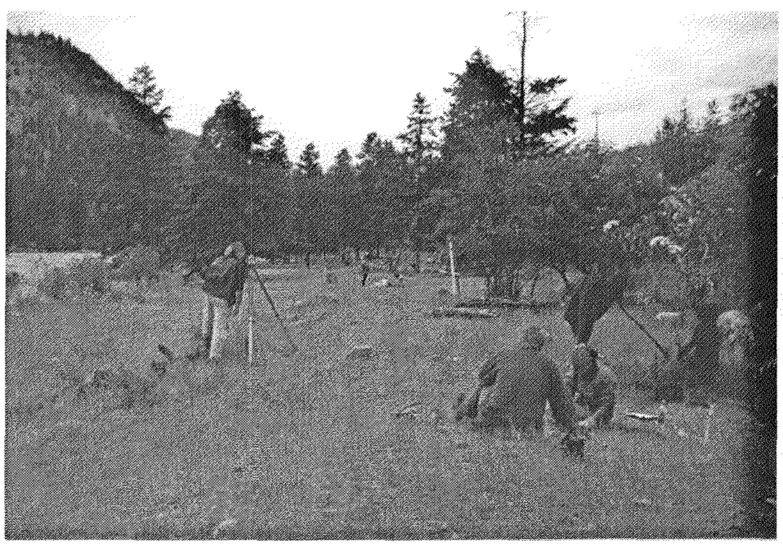

Figure 8.17: DiRa–20

The site was first recorded in 1977 (Carfantan 1977) although the recorders missed four shallow saucer–shaped cultural depressions. Copp, Hudson and Webber (1993) re–recorded the site during a site inventory of the Chuchuwayha Indian Reserve, with shovel testing in 1995 (Copp, Hudson and Webber 1995c). Testing included investigation of a cobble mound situated adjacent to a cultural depression. The mound contained projectile points dating ca. 2,000–4,000 BP. The mound, thought to be a burial, turned out to be a stone oven built ca. AD 1910, most likely associated with railway construction. Seven shovel tests confirmed the presence of sub–surface occupations.

Archaeological investigations continued in 1999. Six, one–meter square evaluative test units were excavated during the Langara Archaeology field school (Copp 1999). Seven more evaluative units were excavated in the 2000 field school season (Copp 2000b). These seasons included excavation of four evaluative test units in one of the cultural depressions. Limited information from these last two seasons can be divulged under a confidentiality agreement between the author and the Upper Similkameen Band since the site is located on Reserve.

Details that can be released include:

- some areas of the site date less than 1,000 BP,
- one cultural depression represents a mat–covered pithouse structure first constructed about 2,000 years ago, then the surface of the depression was reused during the mid– to late 19^{th} century AD, and
- surface and sub–surface artifacts indicate additional occupations dating 2,000 to 4,000 BP.

Excavation methods employed during the 1999–2000 field seasons employed one–meter square excavation units dug in arbitrary 10 cm or natural levels.

Cultural and Natural Stratigraphy. The site is located upon a Holocene terrace formation beside the Similkameen River. Two terraces are evident, the lower being partially subjected to seasonal flooding. The upper terrace, well above flood levels, contains four cultural depressions one of which has been confirmed as originally supporting a probable mat–covered pithouse structure. Both terraces are bounded by glacial till deposits 5 to 40 meters thick along the north and west ends of the site.

Site sediments consist of brown sandy–loams to loamy–sands consistent with fluvial and aeolian deposition. River cobbles and pebbles are rare until the bed of the early Holocene river was encountered at depths of one to two meters below surface.

Feature No. 1: Fire–altered rock is present across the entire site, including a pavement 5–10 cm thick that covers an estimated 25 square meter area at the western end of the site. Two excavation units in this area indicate that the pavement is not a scattered hearth nor is it an earth oven or roasting pit. More work is needed in this area, referred to as Feature #1, to determine its function(s). Associated were Plateau small side and corner–notched projectile points, indicating an age of 200–1,800 BP.

Feature No. 2: Feature No. 2 consists of a dense concentration of smashed and burnt ungulate bone fragments. Samples taken in 1999 and 2000 were submitted for radiocarbon analysis. Results (see below) are consistent with the presence of Plateau small side–notched projectile points found in association.

Feature No. 3: Cultural depression #1, located at the eastern end of the site, was selected for testing in 1999 with additional units added in 2000. An excavation unit through the central portion of the four–meter diameter depression revealed hand–wrought nails over a cobble hearth with dark organic sediments. Below this, and offset west by 50 to 75 cm, was an earlier cobble hearth without dark organic sediments associated with a wide–necked, Plateau side–notched projectile point.

Three excavation units were placed to investigate an hypothesized entrance to the structure as well as rim sections. These units also contained a living floor, faunal remains and 12 projectile points. The projectile points typologically date 1,500–2,500 BP, consistent with a radiocarbon estimate on ungulate bone from the living floor. Of interest was the location of three flat cobbles as probable bases for upright support poles. This has also been observed in Salishan sites in northwest Washington (Chance and Chance 1985: 188) as well as in northern British Columbian Tahltan territory (Fladmark pers comm. 2005).

Floor plan and profile drawings indicate that the floor of structure was excavated to a depth of ca. 40 cm below surface. The relatively shallow depression containing the house floor did not reveal evidence for postholes, but three large, flat cobbles were located at the interface between cultural and non–cultural deposits. These are interpreted as basal support structures for upright posts (See Figure 8.18).

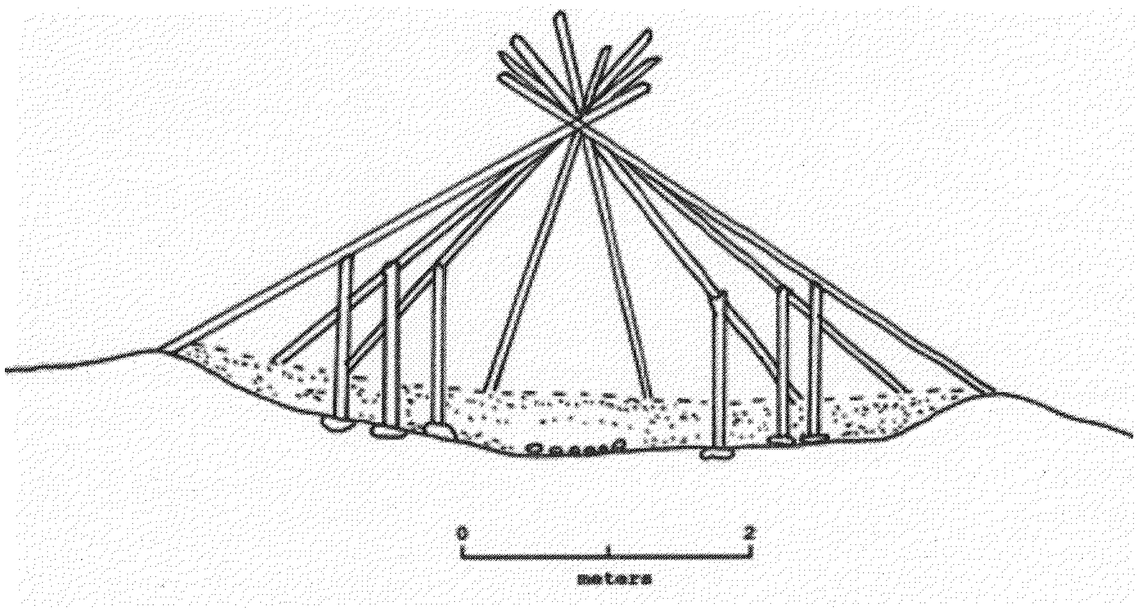

Figure 8.18: Reconstructed Dwelling Structure
(after Chance and Chance 1977: 57, figure 27b)

Whatever the nature of the support poles, the occurrence of pre–contact artifacts starting below the sod layer of the shallow, saucer–shaped depression most likely indicates a traditional pole and earth–covered roof. The majority of artifacts, fire–cracked rock and cultural faunal remains (bone) clustered ca. 30–40 cm below surface. This could also be interpreted as the living floor debris from an earth–covered lodge. Finally, the deposits between the living floor and sod layer may owe their existence to later soil development and/or disturbance from the 19th century re–occupation of the depression. Given the relatively small diameter and shallowness of the deposits in the depression, it is probable that the pre–contact structure was a pithouse, but one with a pole superstructure overlain with woven mats.

Diagnostic Artifacts. Discussions concerning diagnostic artifacts are somewhat limited due to protocol agreements between the author and First Nation concerning the site. All cultural materials were kept on–site where they were measured, sketched and photographed. They were reburied in the site during ritual closing ceremonies.

Figures 8.19 to 8.21 provide illustrations of the most diagnostic artifacts recovered from the site.

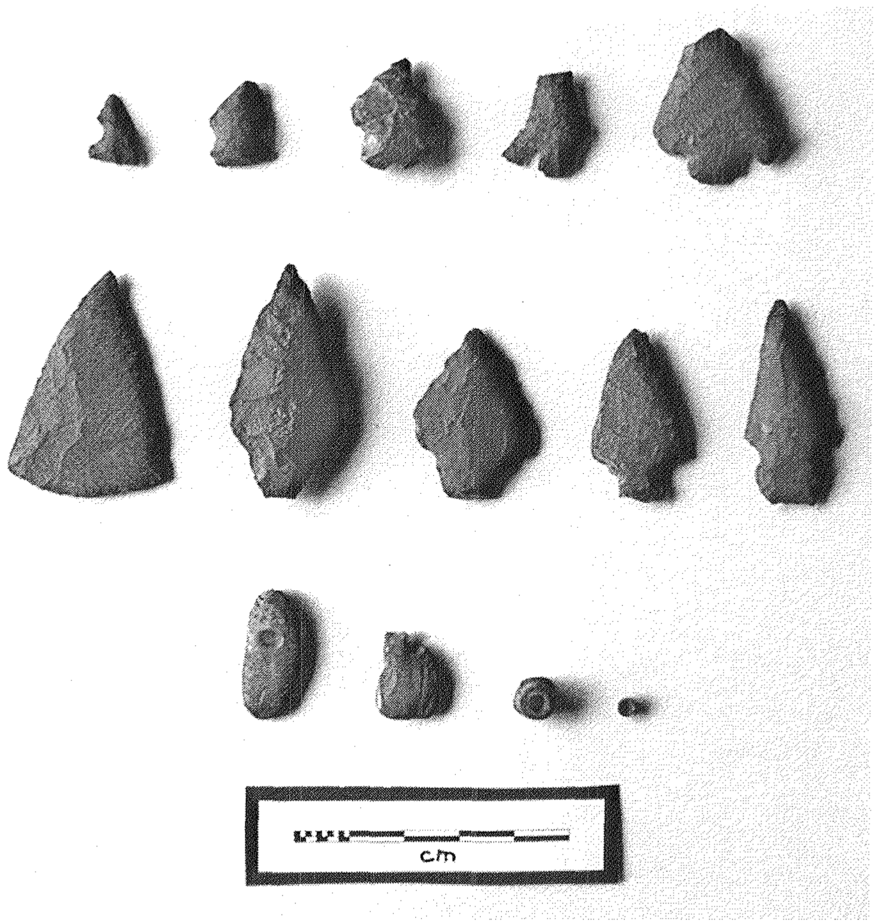

Figure 8.19: DiRa–20 Artifacts (1995–1999)

Key:

Top row: Plateau small side–notched points (2), Desert (Sierra) small side–notched Point, Columbia Corner–notched "B", Columbia Corner–notched "A"
Middle: biface, Nespelem Bar points (3), Plateau side–notched point
Bottom: biconcially drilled bone plaques (2), bone beads (2)

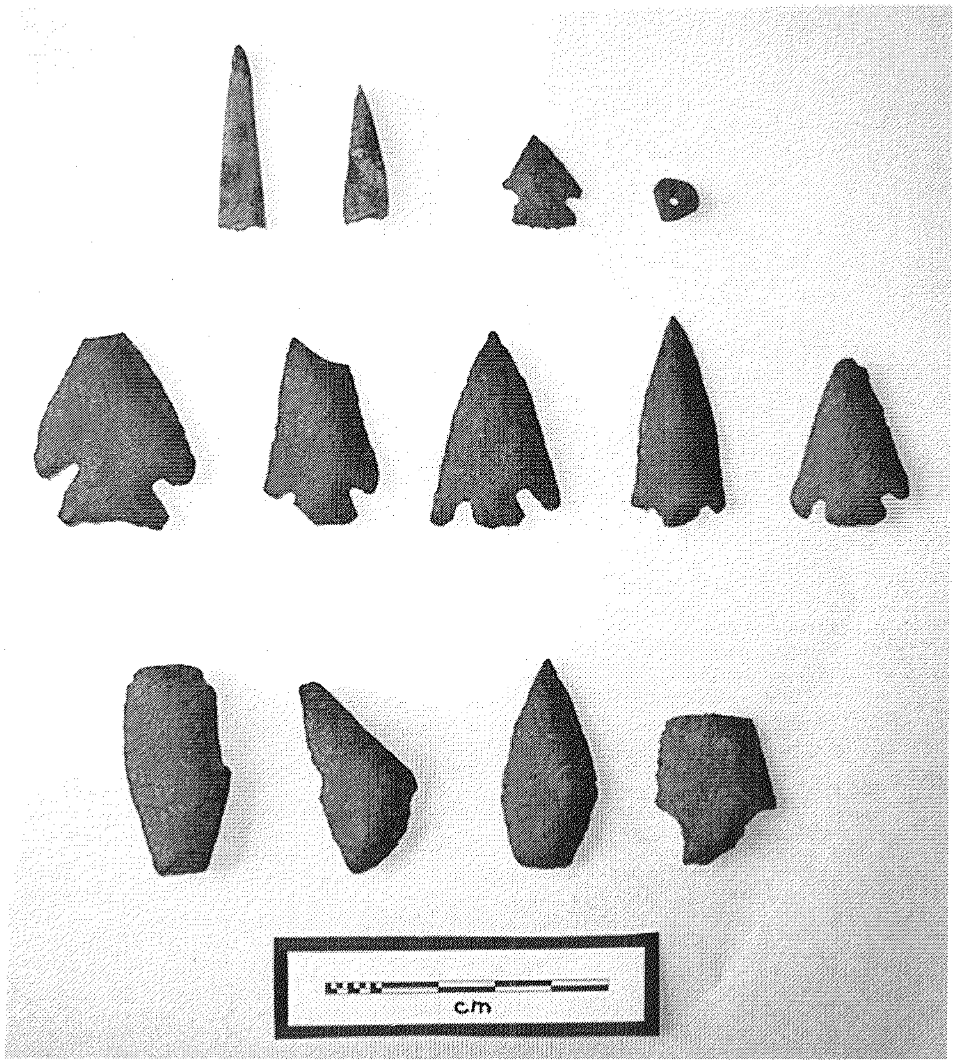

Figure 8.20: DiRa–20 Artifacts (2000)

Key:

Top row: Bone point tips (2), Plateau small side–notched point, stone bead
Middle: Columbia Corner–notched "A", Columbia Corner–notched "B", Quilomene Basal–notched series (3)
Bottom: Leaf–shaped point (broken), leaf–shaped point base, pentagonal–Leaf–shaped point, Nespelem Bar point

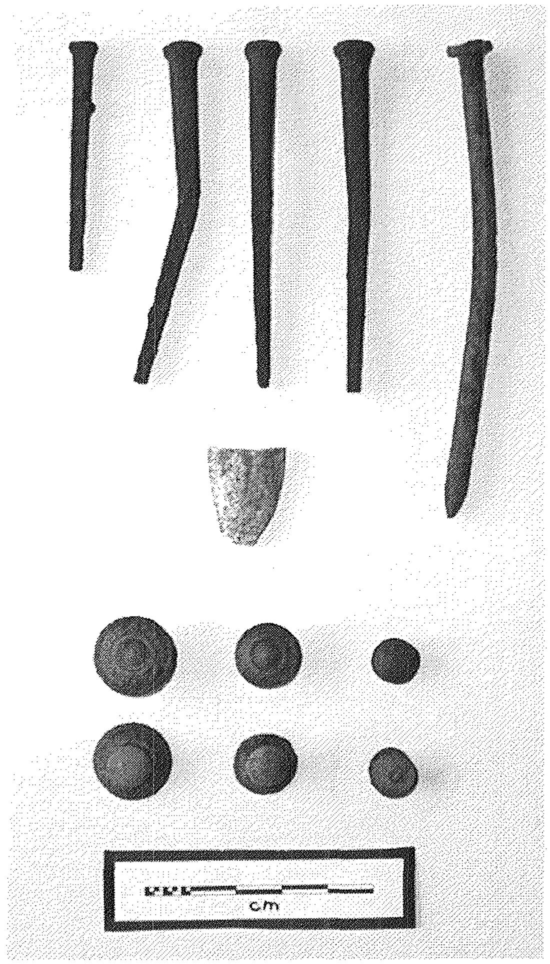

Figure 8.21: DiRa–20 Historical Artifacts

Key:

Top Row: 19th century machine–cut nails, 20th century wire nail (end)
Middle: 19th century ceramic pipe bowl fragment
Bottom: HD Lee Co "Boss of the Road" suspender and pant or jacket buttons ca. 1930s to 1970s

Radiocarbon Assays. Two radiometric assays from this site are:

Sample #1: 710 ± 40 B P (BETA145480)

Cal BP 649–684 @ 1 sd (0.878 probability)

Cal AD 1266–1301 @ 1 sd (0.878 probability)

This sample consisted of over 500 grams of burnt and unburnt ungulate bone fragments from feature #1. The age estimate is consistent with associated Plateau small side–notched projectile points found in, and adjacent to, the burnt bone feature.

Sample #2: **1,980 ± 60 BP** (BETA145479)

Cal BP 1,868–1,995 @ 1 sd (1.000 probability)

Cal BC 46 – Cal AD 82 @ 1 sd (1.000 probability)

Sample #2 consisted of a single large ungulate diaphysis exhibiting stone tool butchering marks. The sample originated in a dense layer of broken ungulate bones, debitage and projectile points interpreted as a mat lodge living floor. The age estimate is consistent with several projectile points typologically dated between 1,500–2,500 BP.

At least three periods of occupation are present in the site; two confirmed by radiometric assay, the third by typology.

Historical (19th and 20th Century) Occupations. A 19th century occupation of Feature #3, originally a pre–contact pithouse, was evident by four machine–cut nails and a ceramic pipe bowl fragment. The pithouse component consisted of dark organic soils and a cobble hearth containing the machine–cut nails. Stratigraphically below this hearth and offset approximately 50 cm west was the pre–contact hearth associated with an occupation dating ca. 2,000 BP.

Twentieth century artifacts located on the surface of the site included three wire nails, as well as four buttons and two rivets embossed "Boss of the Road" and "B of the R". These artifacts were manufactured by the American HD Lee Co between the 1930s and 1970s and represent a pant and/or jacket.

Component Definition. Pre–contact components included:

Sxwalhani.t Phase (200–1,500 BP). Features #1 and #2 exhibited two Plateau small side–notched, a single Great Basin Desert (Sierra sub–type) and a Columbia Corner–notched "B" projectile points. Desert – Sierra subtype projectile points date ca. 100–500 BP (Jennings 1996: Fig. 3) and are characterized by an indented notch in the base. This projectile point is the only example of this type located in the Okanagan–Similkameen. It was manufactured of obsidian but was not submitted for XRF source analysis as it has been reburied. Feature #2, a fragmented bone cluster associated with the two Plateau small side–notched points was radiometrically dated to ca. 750 BP. Two biconically–drilled bone plaques and bone beads were located in evaluative test units.

Snazai'st Phase (1,500–2,500 BP). Feature #3, the mat lodge pithouse feature, was radiometrically dated to ca. 2,000 BP. Projectile points found in the house floor deposits date ca. 1,500 to 2,500 BP and resemble corner–notched and contracting stemmed forms common during this period in both the Thompson and northern Columbia Plateaus. Projectile points and two, bone point tip fragments were the only diagnostic artifacts located within the structure apart from lithic debitage and faunal remains.

Tcutcuwi'xa Phase (2,500–4,500 BP). Two Nespelem Bar ("Similkameen Stemmed") projectile points are indicative of occupations dating 2,500–4,000 BP. Both originate in sub–surface deposits excavated in 1995. One is associated with construction of an early 20^{th} century stone oven and cannot be considered to have been in situ. The other was located in a test unit in an area of the site that requires additional investigation to confirm the presence of pre–2,500 BP occupations.

Princeton Golf Club (DiRc–66) Site

The Princeton Golf Club site (DiRc–66) was discovered on 04 May 2000 during a preliminary field reconnaissance (Copp 2000d). At the time of its discovery, pre–contact and historical artifacts were observed on the surface of an area north, east and west of a freshwater spring adjacent to the new #14 fairway. These surface–collected artifacts indicated that the site had potential for undisturbed sub–surface components dating from the historic (ca. AD 1827 to present), Late (ca. 200–2,000 BP), Middle (ca. 2,000–5,500 BP) and Early (ca. 5,500–8,000 BP) pre–contact periods.

Based upon surface and sub–surface distributions, DiRc–66 extends for a distance of 50 meters west and 40 meters north of the site datum (springs) [DiRc–66 West], with a second surface and sub–surface assemblage at 60 to 110 meters east and 15 to 65 meters north of the datum in addition to the displaced cultural materials on the break–in–slope.

Systematic pedestrian field traverses oriented east–west along the main axis of the #14 fairway discovered a second cluster of surface artifacts of post– and pre–contact time periods. These materials were located 70 to110 meters northwest of the springs on gently sloping ground west of a break–in–slope (Figure 8.22). Pre–contact cultural materials surface–collected from this area included a leaf–shaped projectile point of the Cascade (4,500–7,500 BP) type, basalt (dacite) and cryptocrystalline silicate debitage

A third cluster of cultural materials was located 10 to 30 meters to the southeast, on the break–in–slope. These included pre–contact lithic debitage in addition to fragments of historical glass and a modern golf ball.

Sub–surface shovel tests and larger one metre square evaluative test units were excavated through cultural and natural deposits adjacent to the springs (DiRc–66 West), across the old spring channel and in the area of the second surface cluster near the break–in–slope (DiRc–66

East). The cultural materials spread over the break–in–slope are also considered part of the overall site, albeit in a secondary depositional mode.

Fire–altered rock was scarce in excavated units. No organic materials suitable for radiometric analysis were recovered. Charcoal, although present, could not be positively identified as the result of cultural versus natural activities.

Cultural and Natural Stratigraphy. Sediments ranged from a layer of aeolian mine tailings silts (1 to 10 cm below surface) found across the site, through mixed tailings and sandy–silty loams, sandy–silty loams to sandy–gravels. Cultural materials, where present, were found in all strata except basal sandy–gravels.

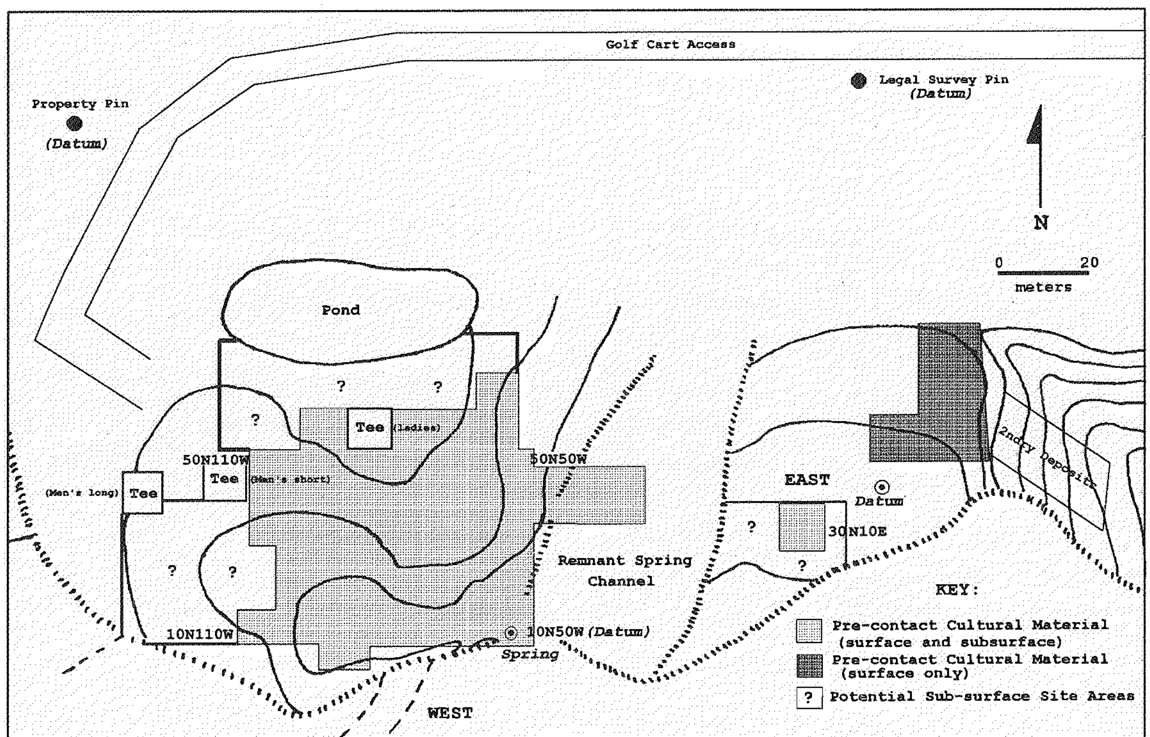

Figure 8.22: Princeton Golf Course Site (DiRc–66)

The lack of growing grass and parts of the A_0 soil horizon in DiRc–66 West from approximately 20 meters north of the datum reflects the loss of these materials by mechanical scraping into a back dirt pile by golf course employees. Anthropogenic sediments as well as a 5–10 cm thick layer of aeolian tailings, were removed, piled, then redistributed on the break–in–slope east of DiRc–66 East, as well as on other portions of the golf course – notably the #12 tee platform where four specimens of lithic debitage were observed. Mechanical removal of anthropogenic soils was also located throughout DiRc–66 East except for an area within 10 meters of the south slope bordering the site.

Table A.14 clearly indicates the relative lack of sediment depth (65N20E and 65N45E) as well as the shallow (ca. 30 cm below surface) cultural deposits below the overburden at 20N10E. This, along with the relatively small assemblage of surface artifacts, has at least two explanations:

1) cultural deposits have been displaced and/or removed by mechanical means, or

2) cultural deposits north of the southern boundary of DiRc–66 East originally were very shallow (less than 15 cm below surface) before disturbance.

Cultural Materials Recovered: DiRc–66 West. The total number of pre–contact lithics recovered from DiRc–66 West was 663, including 150 surface collected and 513 excavated specimens (see Tables A.12 and A.13). Diagnostic materials included a side–notched projectile point, one leaf–shaped projectile point, two projectile point base fragments, two projectile point tips, two microblade cores, and 20 microblades. Two non–diagnostic bifaces and/or performs were also recovered.

Post–contact artifacts included a clay pipe stem fragment, two handgun cartridge cases, one long–rifle cartridge with primer and the base of one 12–gauge shotgun cartridge case with primer. See Tables A.14 and A.15.

No sub–surface features were encountered. Fire–cracked rock was rare to non–existent in all excavation units and shovel tests. The lack of sub–surface features such as hearths, post–holes, or pits is an indication that the area north of the natural freshwater springs served a function as a short–term camp or field station in which only limited activities were carried out.

Cell artifact density counts presented in Tables A.12 and A.13 indicate that cultural materials removed with topsoil by golf club personnel tended to distribute artifacts and historic debris 10 or more meters northeastward. This culminated in the six (6) cubic meter pile of cultural sediments later spread on the upslope area of the 14^{th} fairway.

Table A.12: Surface Debitage Provenience, DiRc–66 West

North:	10	20	30	40	50	60	70	80	90	100	110	Totals
0							1					1
10						2		1				3
20		1			1	10	14	7				33
30		1		4	6	12	23	3				49
40	1		1	10		31	12	1		1		57
50					1	3	1	1	1			7
60					2				1			3
70		1										1
80												
90												
Totals	**1**	**3**	**1**	**14**	**10**	**58**	**51**	**13**	**2**	**1**		**154**

Table A.13: Excavated Debitage Provenience, DiRc–66 West

North:	10	20	30	40	50	60	70	80	90	100	110	Totals
0												
10						13	11	38	2	2	3	69
20					3	1		213	11			228
30					2	2		10	46	60		120
40				1	12		1			1		15
50					23	2					14	39
60												
70												
80												
90												
Totals				**1**	**40**	**18**	**12**	**261**	**59**	**63**	**17**	**471**

Table A.14: Surface Artifacts, DiRc–66 West

Cat. #	Provenience	Type	Material	Length	Width	Thick
001	**30N80W**	Microblade core	Chert			
002	**30N80W**	Microblade core	Black chert			
003	**20N60W**	Projectile Pt. Base	Black chert	1.6	1.0	0.3
004	**30N70W**	Projectile Pt. Base	Black chert	1.6	0.8	0.3
005	**50N80W**	Projectile Pt. Tip	Black chert	1.7	1.4	0.3
006	**42.45N 40.95W**	Biface/perform	Red chert	5.4	3.2	1.0
007	**42.45N 40.95W**	Side–notched Proj. Pt.	Black chert	2.9	2.7	1.4
008	**55N30W**	Cartridge Case 12 ga	Brass	2.8	2.3	2.3
009	**30N80W**	Pipe stem "313"	Ceramic	2.7	0.9	0.9
110	**50N50W**	Handgun cartridge	Brass			
011	**60N60W**	Long rifle cartridge	Brass			
012–018	**20–60N, 30–90W**	Debitage	Chert			

Sub–surface Excavations DiRc–66 West. Sub–surface shovel tests in this area numbered 32. Five additional shovel tests were expanded into one (1) meter square evaluative test units. An additional five (5) shovel tests were excavated in the old springs channel separating DiRc–66 West and East site areas (see Figure 8.22). Shovel and evaluative test unit results are presented in Tables A.13 and A.14.

Table A.15: Excavated Diagnostic Artifacts, DiRc–66 West

019	***10N70W***	10–20	Proj. Pt. Leaf	Basalt	3.9	2.1	0.5
020	**10N80W**	10–20	Microblade, proximal	Chert	2.0	0.9	0.3
021	**20N50W**	20	Proj. Pt, tip	Basalt	2.0	1.1	0.2
022	**20N80W**	10–20	Biface Preform	Basalt	4.3	2.8	1.2
023	**20N80W**	10–20	Microblade	chert	1.5	0.6	0.2
024		20–30	Microblade	Chert	2.0	0.6	0.1
025		20–30	Microblade	Chert	2.0	0.7	0.1
026		20–30	Microblade	Chert	1.5	0.5	0.2
027		20–30	Microblade	Basalt	2.0	0.6	0.1
028	**30N50W**	30	Microblade	Chert	2.4	0.4	0.2
029	**30N100W**	10	Cartridge, 22 caliber	Brass	1.5	0.5	0.5
030		10–20	Microblade	Chert	1.7	0.6	0.2
031		10–20	Microblade	Chert	1.6	0.5	0.2
032		20–30	Microblade	*Basalt*	1.9	0.6	0.1
033		30–40	Microblade	Basalt	2.6	0.5	0.2
034		30–40	Microblade	Basalt	2.2	0.5	0.1
035		30–40	Microblade	Basalt	2.4	0.6	0.2
036		30–40	Microblade	Basalt	2.4	0.5	0.2
037		30–40	Microblade	Basalt	1.9	0.6	0.1
038		30–40	Microblade	Basalt	1.8	0.5	0.2
039		30–40	Microblade	Basalt	2.4	0.5	0.2
040		30–40	Microblade	Basalt	1.2	0.7	0.2
041		30–40	Microblade	Chert	1.8	0.5	0.2
042	**40N40W**	40–50	Microblade	Chert	1.7	0.5	0.2

Diagnostic Artifacts: DiRc–66 West. The following describes artifacts recovered from this portion of the site.

A. Projectile Points (N = 2)

A.1 Leaf–shaped (N =1), Figure 8.23a

This specimen resembles a Cascade "C" projectile point type (cf. Butler 1961). It exhibits a generally slender lanceolate body, absence of notching, and a contracting base. Similar specimens date ca. 4,000–8,000 BP in Columbia Plateau sites and 3,000–8,000 BP in the Thompson Plateau. It measures 4.1 by 2.0 by 0.4 cm (length by width by thickness).

A.2 Columbia Corner–notched, Type B (N =1), Figure A24c

A single Columbia Corner–notched "B" projectile point was recovered from the surface in proximity to the area that contained the mound of disturbed sediments north of the springs. Although missing the tip, it is complete in all other respects.

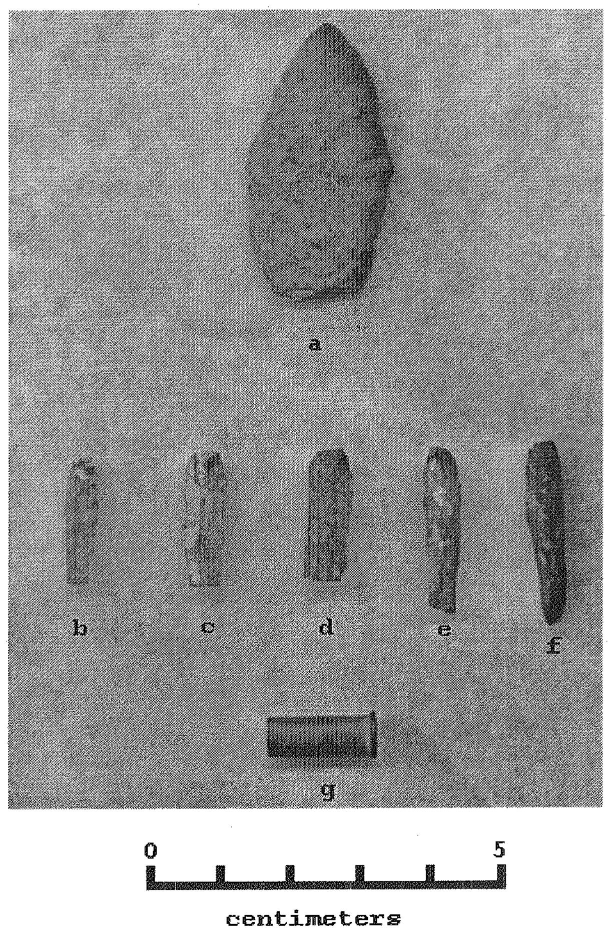

Figure 8.23: DiRc–66 (West) Excavated Diagnostic Artifacts

Key:
Top row: Pentagonal biface
Middle: Microblades
Bottom: 22 calibre rimfire cartridge

This point type has moderate to large bodies with triangular shapes and straight to convex blade margins. Corner notches are wide and deep. Stems are expanding and barbs project downwards. Bases are generally straight. Points of this type tend to date 2,000–4,000 BP in the Columbia Plateau (Lohse 1985; Vivian 1992) and 1,200–2,400 BP for Thompson Plateau variants. This specimen measured (2.9) by 2.7 by 0.3 cms (length by width by thickness). The neck–width between barbs measured 1.2 cm.

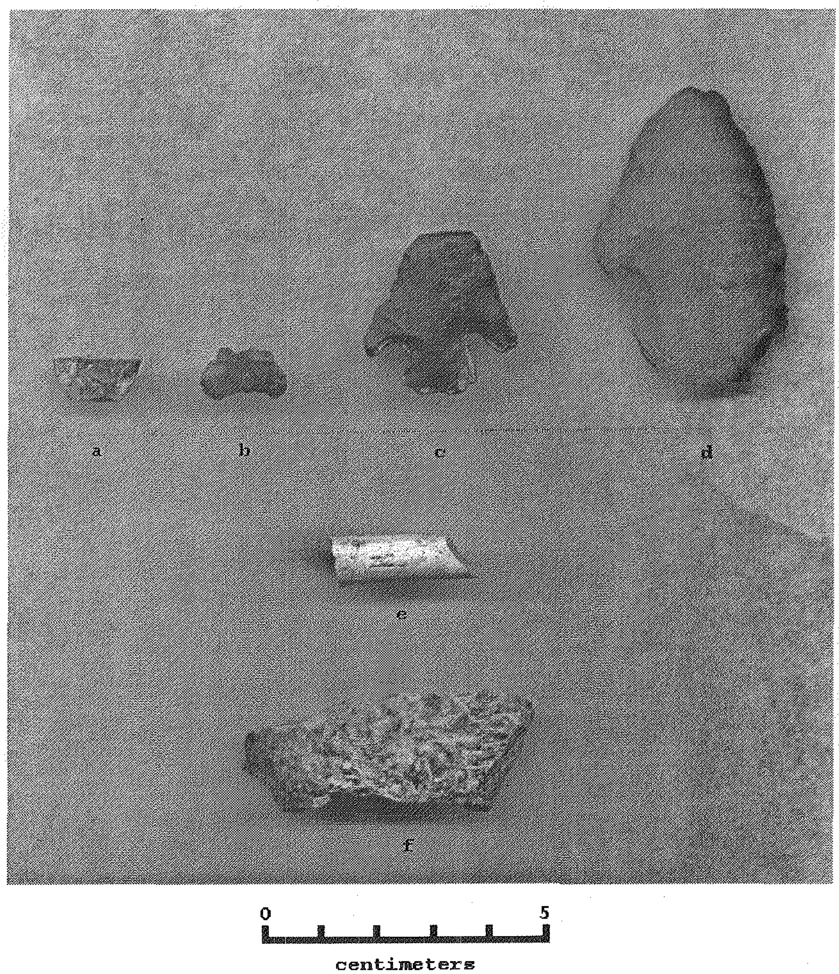

Figure 8.24: DiRc–66 (West) Surface Diagnostic Artifacts

Key:

Top row: Rabbit Island B base; small side–notched point base, Columbia corner–notched B; Mahkin Shouldered

Middle: 19th Century ceramic pipe stem fragment

Bottom: Microcore

A.3 Biface/Preform (N = 1), Figure A24d

This biface is similar to a Mahkin Shouldered perform (cf. Lohse 1985; Vivian 1992: 85). Mahkin Shouldered points appear to be restricted to the northern Columbia Plateau and date 3,500–6,700 BP (Lohse 1985). They appear in context with Cascade and Cold Springs side–notched point types of the late Cascade Phase (Lohse 1985; Vivian 1992: 83). This specimen measures 5.4 by 3.4 by 0.5 cm (length by width by thickness) and is manufactured of a dull brick–red chert.

B Plateau Microblade Tradtion

B.1 Microblade Cores (N = 2), Figure A24f

A wedge–shaped microblade core (Figure A24f) and a core fragment, were located during the preliminary field reconnaissance of DiRc–66 West. Both are manufactured of cryptocrystalline silicates (chert), are wedge–shaped, and exhibit removal of microblades from on end of the core. The core striking platforms are flat and do not exhibit negative bulbs of percussion, concentric rings or *eraillures*.

B.2 Microblades (N = 23b–f)

All microblades recovered fit Sanger's (1970a,b) and Wyatt's (1970) definitions and morpho–metric criteria discussed above. None exhibit use wear or intentional modification. As such, they may represent discards. Metric information is presented in Table A.13.

D. Historical Artifacts

The following artifacts of historical (post–1827 AD) indicate use of the springs area during the 19th and 20th centuries:

D.1 Cartridge Casings (N = 4)

Four cartridge casings were located. Three were surface finds, the 22 caliber cartridge case was recovered within the first 10 cm level of excavation in a one meter^2 evaluative unit (50N50W) where mixing was likely the result of recent mechanical topsoil removal activity. Three of the four are 20th century artifacts. The fourth is a late 19th century handgun cartridge casing (D.1.2 below).

D.1.1 Shotgun Cartridge Casing, 12 gauge (N = 1)

This 12 gauge shotgun cartridge casing is a late 19th to early 20th century paper and brass shell type. The surviving brass casing would have supported a paper cartridge filled with powder, shot and wadding. The percussion cap indicates it had been fired. There was no maker's mark on the base.

D.1.2 Hand Gun Cartridge Casing, 38 caliber (N = 1)

This 38 caliber hand gun cartridge is complete. Two rectangular firing pin depressions on opposite sides of the cartridge rim base indicate it to be a late 19th century Boxer (non–percussion cap) type of cartridge. An "H" impressed into the center of the base represents an unknown manufacturer.

D.1.3 Hand Gun Cartridge Casing, 22 caliber (N = 1) [Figure 8.23g]

A single 22 caliber short cartridge was recovered. This cartridge can be fired in a long rifle or handgun. A single rectangular firing pin impression on the cartridge rim base indicates that it has been fired.

D.1.4 Long Rifle Cartridge Casing, 30–06 caliber (N =1)

A single 30–06 long rifle cartridge was recovered. The percussion cap exhibits evidence of firing in the form of an oval firing pin impression. A maker's mark consists of "VII" above "1917" denotes Dominion (Canadian government) ammunition originally (AD 1917) manufactured for use late in the First World War. Ammunition bearing this mark was readily available as recently as the mid–20th century.

D.2 Pipe Stem Fragment (N = 1) [Figure 8.24e]

A single ceramic pipe stem fragment was located on the surface of the disturbed area north of the springs. It exhibits an impressed "323" maker's mark or production number of unknown origin. Suggested origins include 19th century Canadian, American, British or French manufacturers.

Diagnostic Artifacts: DiRc–66 East. DiRc–66 is defined as that portion of the site located east of the old spring channel. It consisted of a surface scatter of 27 pieces of debitage and one leaf–shaped projectile point found on the 14th fairway. Sixteen sub–surface test units were dug. Ten shovel test units placed in this area did not reveal sub–surface cultural materials. This is an indication that anthropogenic sediments were removed from this area prior to fieldwork, or that these culturally sterile materials were deposited from DiRc–66 West during land altering activities. The latter hypothesis would appear to be most likely given the presence of additional transported materials on the fairway slope east of this area.

Table A.16: Surface Collection Provenience, DiRc–66 East

North	**50**	**60**	**70**	**80**	**90**	**100**	**Totals**
80							
70				2	1		**3**
60	1	1		4	4	1	**11**
50		1		2	6		**9**
40			1	2	1		**4**
30							
Totals	**1**	**2**	**1**	**10**	**12**	**1**	**27**

Three shovel test units located near a freshwater spring, or seep, near the break–in–slope of the 14th fairway were negative, except for three units placed near the edge of the old spring channel. Shovel test #10, located near a blazed culturally modified tree, exhibited four sub–

surface pieces of debitage. Shovel test units #8 and #9 were placed on the western edge of an open backhoe trench containing a buried water pipe leading from the freshwater springs to the clubhouse.

Shovel tests 8 and 9 (unit 20N10E) were expanded into two contiguous one meter^2 evaluative units given the density and types of lithic cultural materials recovered. This material consisted of seven CCS and two quartz crystal microblades, a quartz crystal core fragment and 602 pieces of debitage .

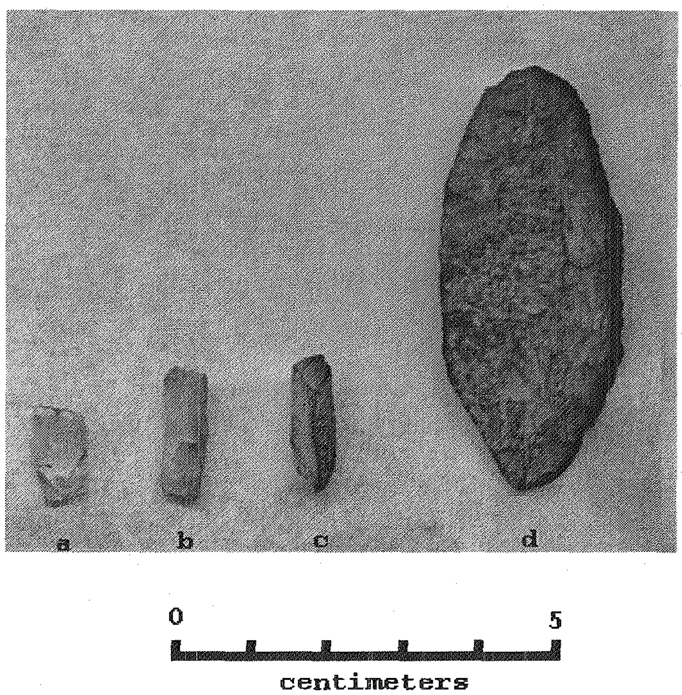

Figure 8.25: Diagnostic Artifacts DiRc–66 East

Key:
a to c: microblades, d: Cascade (leaf) point

A. Projectile Point

A.1 Leaf–shape (N = 1), Figure 8.25d

This specimen conforms to the classic Cascade "A" projectile point type (cf. Butler 1961). It exhibits a slender lanceolate body, absence of notching, and a contracting rounded to pointed base. Similar specimens date ca. 3,000–8,000 BP in Thompson and Columbia Plateau sites. It measures 5.8 by 2.6 by 0.5 cm (length by width by thickness). It was surface collected near shovel test units 8 and 9 (unit 20N10E) prior to the establishment of the site grid.

B. Plateau Microblade Tradition

Dacite and cryptocrystalline silicate microblades struck from wedge–shaped cores are known to date ca. 1,800–7,400 BP, as indicated previously. The quartz crystal artifacts recorded from DiRc–66 East add to the inventory of this rare type and raw material.

B.1 Quartz Crystal Microblade Core Fragment (N = 1)

A single distal core fragment of quartz crystal was recovered in the undisturbed matrix of units 20N10E. It is assumed to be a broken fragment of microblade core based on the presence of two microblades of the same material found in association. It could also represent a broken base section of an unmodified quartz crystal.

B.2 Microblades, Quartz Crystal (N = 2)

Both quartz crystal microblades are complete (see Table A.15). Neither specimen exhibits use–wear or modification.

B.3 Microblades (N = 7) [Figure 8.25a–c]

Four of these classic Plateau microblades were manufactured of local basalt (dacite). The remainder was made of a black chert. They do not exhibit use–wear or intentional modification.

Table A.17: Diagnostic Artifacts, DiRc–66 East (20N10E)

Cat #	DBS (cm)	Type	Material	Length	With	Thick
043	10–20cm	Microblade	Basalt	2.3	0.8	0.2
044	10–20cm	Core fragment	Quartz Crystal	1.2	0.8	0.4
045	20–30cm	Microblade	Basalt	1.7	0.6	0.1
046	20–30cm	Microblade	Basalt	1.7	0.7	0.1
047	20–30cm	Microblade	Black Chert	1.8	0.6	0.2
048	20–30cm	Microblade	Quartz crystal	1.3	0.8	0.1
049	20–30cm	Microblade	Quartz crystal	0.8	0.7	0.4
050	40–50cm	Microblade	Basalt	1.0	0.9	0.1

Component Definition. Excavated and surface–collected materials indicated the presence of the following pre–contact components:

Acnol'ux Phase (4,500–7,500 BP). The artifacts recovered from one shovel test and two conjoined evaluative test units in DiRc–66 East included debitage, leaf–shaped (Cascade) points (Figure 8.23a, A.25d), microblades (CCS, basalt and quartz crystal) as well as a quartz crystal core fragment. This assemblage resembles the early Acnol'ux Phase (6,000–7,500 BP) at the Stirling Creek site (DiRa–09).

Artifacts from surface and sub–surface assemblages at DiRc–66 West represent a mixture of occupations. This is most likely the result of recent removal of topsoil sediments during golf course construction. Excavated microblades, two surface microcores and a biface perform resembling a Mahkin Shouldered (Figure 8.24d) indicate an estimated later (ca. 4,500–6,000 BP) occupation. Larger, block excavations are required to verify this hypothesis.

Tcutcuwi'xa (2,500–4,500 BP), Snazai'st (1,500–2,500 BP) and Sxwalhani.t (200–1,500 BP) Phases. Surface materials recovered from the surfaces of both sites areas suggest sporadic occupation and/or use of the springs. More cannot be said as golf course construction has almost totally eradicated any intact anthropogenic sediments around the springs.

The Princeton Golf Club Spring site (DiRc–66) provided limited evidence for early to later Cascade Horizon use of the springs area. It is suggested that these occupations took the form of logistical camps from which activities in surrounding areas were staged. Although evidence is slight, the occupations on the eastern side of the springs appear to be earlier than the west. This may indicate movement of the springs westward from an earlier source represented by a seep near the break–in–slope.

The Cool Creek Site (DhQx–10)

As early as 1974, archaeological materials on the large river terrace on both sides of Cool Creek had been observed (Copp 1975). As the western terrace was under cultivation in 2003, permission was sought to investigate areas east of the creek. This eastern terrace extends from Cool Creek approximately 250 meters downstream. The area immediately adjacent to the creek contains log corrals that have been in operation for approximately 30 years and exhibited 20 to 30 cm of accumulated dung deposits. The eastern end of the terrace contains two haystacks and the intervening field supports a few Ponderosa pines and a surface cover of grasses.

Initial investigations included pedestrian surveys of the eastern terrace. Several flakes, fire–cracked rocks and several bones were observed on access road surfaces. Ground cover and compressed dung deposits obscured ground surfaces elsewhere.

The first excavation units consisted of 50–centimeter square shovel tests excavated at 10–meter intervals in the field west of the haystacks. Excavations in the field covered an area of 40 x 50 meters (grid units 0–40 North, 100 to 150 West). See Figure 8.26.

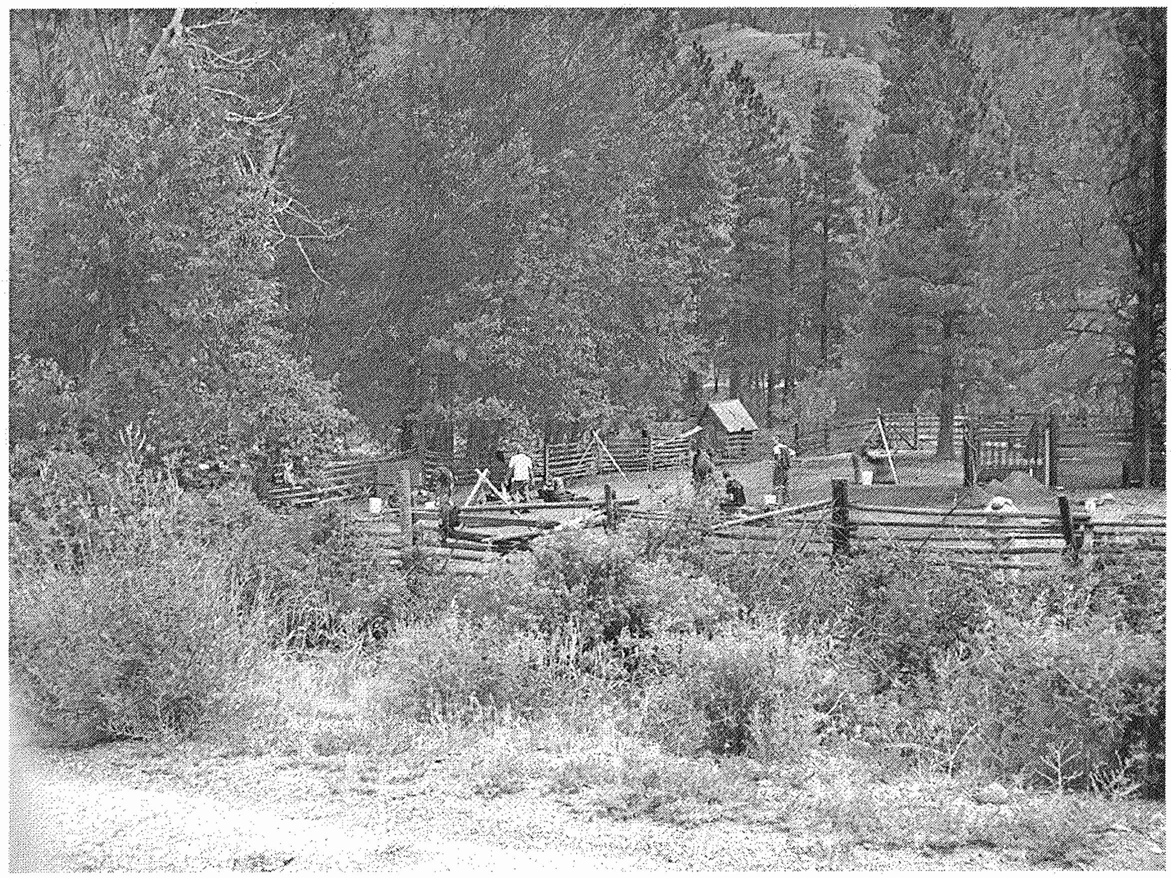

Figure 8.26: Cool Creek Site (DhQx–10)

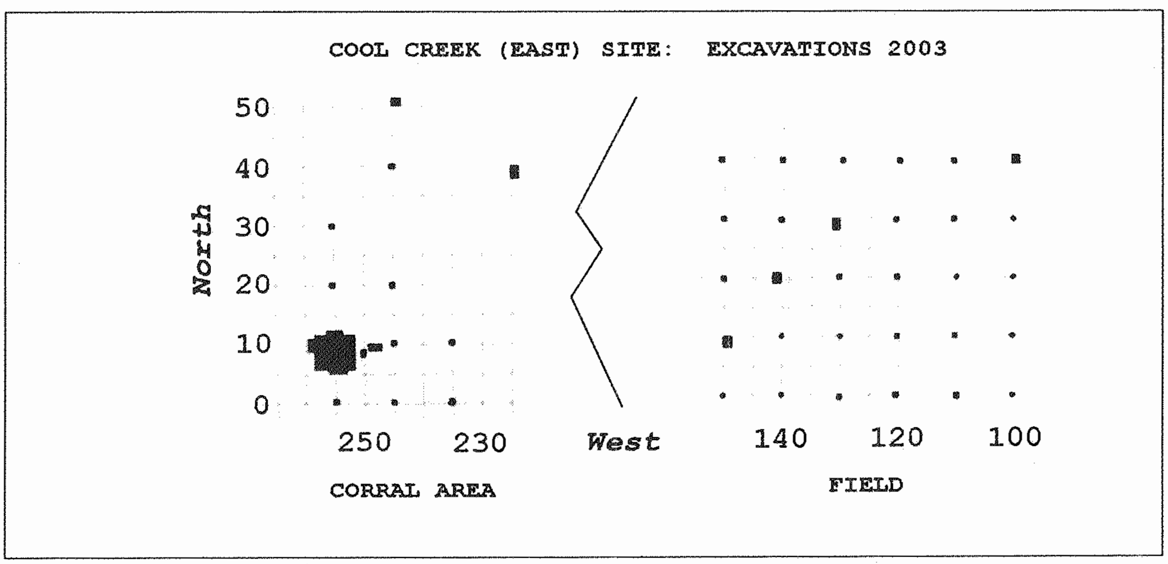

Figure 8.27: Cool Creek Excavation Units

Field Excavation Units. Several units encountered pre–contact lithic artifacts (flakes), fire–cracked rock and bone. These were expanded into 100 or 200–centimeter square units depending upon the nature of materials encountered. Three units (40N130W, 30N140W and 10N150W) exhibited significant amounts of fire–cracked rock, bone and lithic artifacts, although none were temporally diagnostic.

There appeared to be at least two occupations present in this area of the site. A surface to subsurface occupation extending approximately 0 to 10 cm below surface and an earlier occupation approximately 20 to 30 cm below surface (see Figure 8.28).

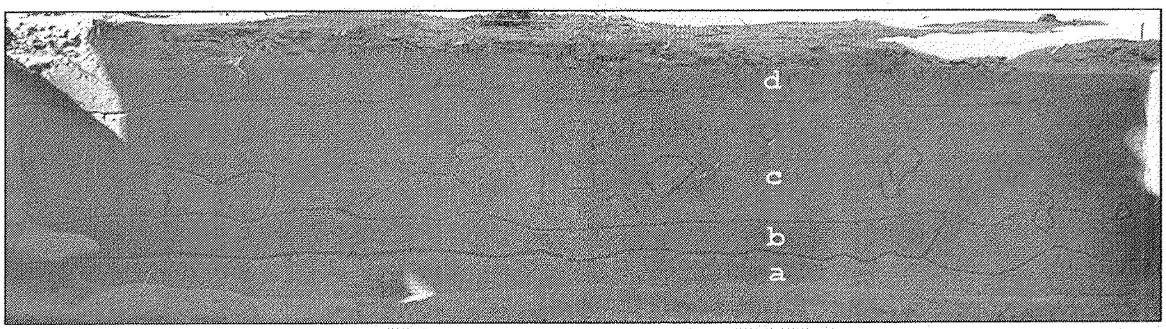

Figure 8.28: Cultural Strata (Unit 10N150W)

Key:

Key:	**a**	Non–cultural silty–sandy loams
	b	Earliest cultural deposit (ca. 4500 BP)
	c	Mixed deposit, interfaces with layers "b" and "d"
	d	Most recent cultural deposit (ca. 200–1000 BP)
		Note cobble manuport in lower left of photo, stratum "b"

Sediments consisted of light yellowish–brown to brown silty–sandy loams to silty–sands with evidence of long–decayed tree roots and rodent burrows (visible above in stratum "c"). Underlying non–cultural deposits consisted of fine to medium yellow–brown to grey sandy–silts above river cobbles and boulders at 1.5 to 2.0 meters below surface.

Sediment layer "d", the most recent pre–contact cultural level, was characterized by scarce pieces of fire–cracked rock and a few lithic flakes. The single exception was unit 40N150W where a small corner–notched projectile point was located 12 cm below surface (see Figure 8.24j). This type of projectile point usually dates within the last 200 to 1,000 years in the Okanagan–Similkameen valley system.

Sediment layer "b" in unit 10N150W is of interest because it shows higher levels of cultural modification and organic materials. This layer also contained numbers of dacite (basalt) flakes, fire–cracked rock and bone – including diagnostic ungulate molar teeth.

Corral Excavation Units. Excavations in the corral area began as 50–centimeter square shovel tests, with expansion to 100 or 200–centimeter square units based upon the density and nature of pre–contact materials located. They soon indicated that the highest density of cultural materials were a block measuring 5 to 14 meters North and 235 to 259 meters West within the main corral. Additional materials were found east of the main corral area within the access road at 40N223W, where a subsurface hearth feature was located 10 to 30 cm below surface, as well as in two units between the corral fence and the Similkameen River.

With the exception of the single projectile point noted above, diagnostic (temporally–indicative) artifacts were only located within the major block excavation area. The corral and adjacent areas provided diagnostic projectile points indicating the presence of at least two occupations: an initial occupation dating 2000 to 2500 years or older and later occupations dating 200 to 500 years in age.

Other artifacts recovered included three large bifaces ("knives"); projectile point bases, tips and medial sections; a large quartzite scraper; a laterally retouched chert blade; and several pieces of quartz crystal (see Figures 8.29 to 8.33). The two largest bifacial knives derived from the earliest occupation levels in the corral area, whereas the quartz crystal, with a single exception, originated in the more recent occupation levels.

Features. Hearth features consisted of concentrations of fire–cracked rock (Type 1) and basin–shaped features of baked clay and ash (Type 2).

Type 1 hearths consisted entirely of concentrations of fire–cracked rocks located in units 10N150W, 20N140W and 30N130W at depths ranging from 15 to 35 cm below surface. Types 1 and 2 (fire–cracked rock and baked clay) were found in, or near, the corrals. Type 1 hearths were located between 3 and 30 cm below surface in components 1 and 2 of the corral main excavation area as well as in 40N223W.

Type 2 hearths were located only in the northern portion of the block excavation in the corral. These features consisted entirely of baked clay and ash without fire–cracked rock and were located between 10 and 20 cm below surface. A larger hearth lay within the boundaries of 10–11 North by 254–256 West (Figure 8.33) with a smaller example located in 11–12 North by 255–256 West. Both were thought to derive from the later pre–contact (component 2) occupation but a radiometric assessment of 112.36 ± 0.56 pMC (Beta–183263) indicated an age of less than 50 years. As such, apparent Type 2 hearth features probably resulted from 20^{th} century land–altering activities such as stump or trash burning.

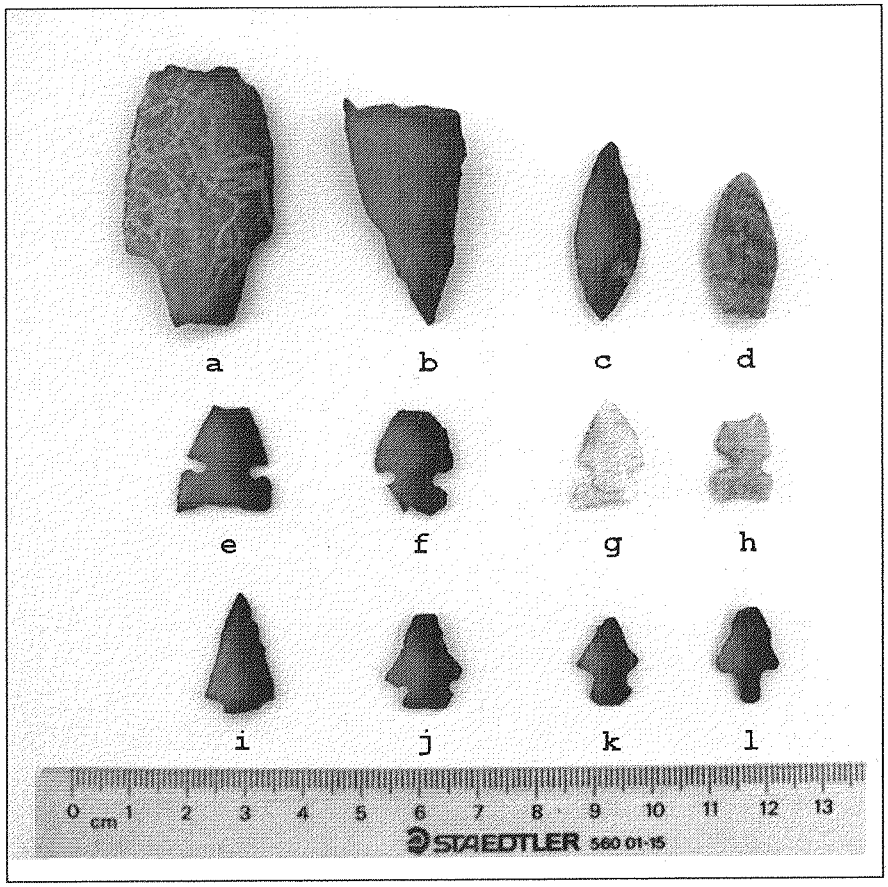

Figure 8.29: DhQx–10 Diagnostic Artifacts

Key:

Note: all from corral units with the exception of item "j"

a to c: 20 to 30 cm below surface (Component 1) – 2,000–2,500 BP: Nespelem Bar, biface base, small leaf–shaped point

d to l: 0 to 10 cm below surface (Component 2) – 200 to 500 BP: small leaf–shaped point, small side–notched points (e,f,g,h), Plateau side–notched, Quilomene Bar basal–notched, small side–notched (atypical), and Wallulla Rectangular Stemmed.

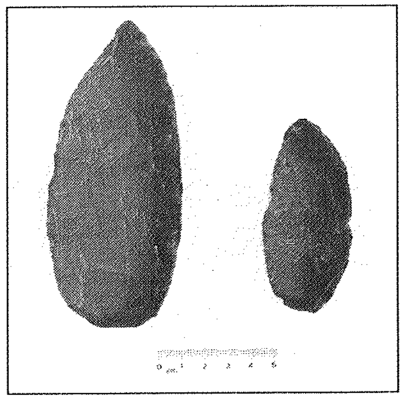

Figure 8.30: Component 1 Large Bifacial Knives

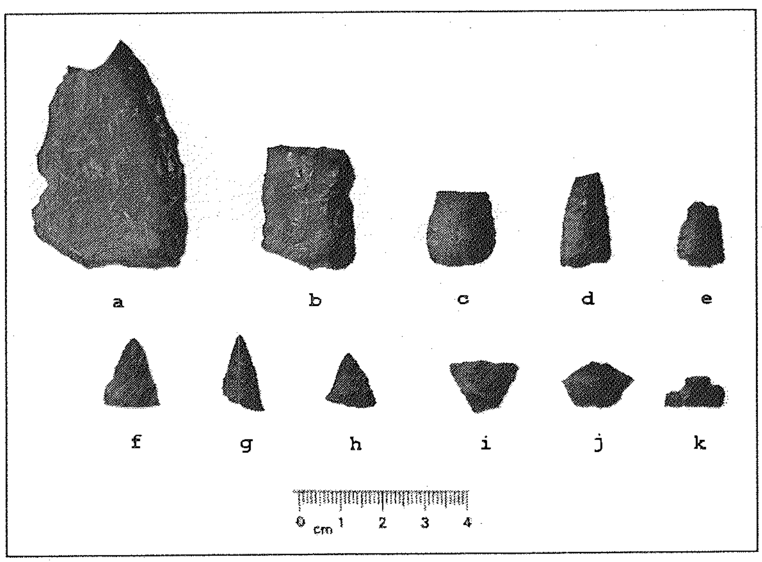

Figure 8.31: Component 2 Biface and Projectile Point Fragments

Key:

a, b	Biface mid–sections
c	Biface mid and base
d, e	Projectile points, corner–notched (missing tip and base)
f–h	Projectile point tip sections
i, j	Projectile point base sections
k	Small side–notched projectile point base

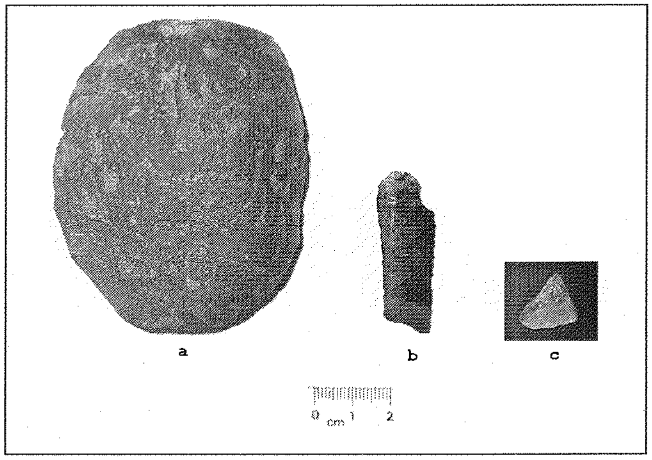

Figure 8.32: Other Artifacts

Key:

a	large quartzite scraper (Component 2)
b	laterally–retouched chert blade (Component 2)
c	bifacially–flaked quartz crystal (Component 1)

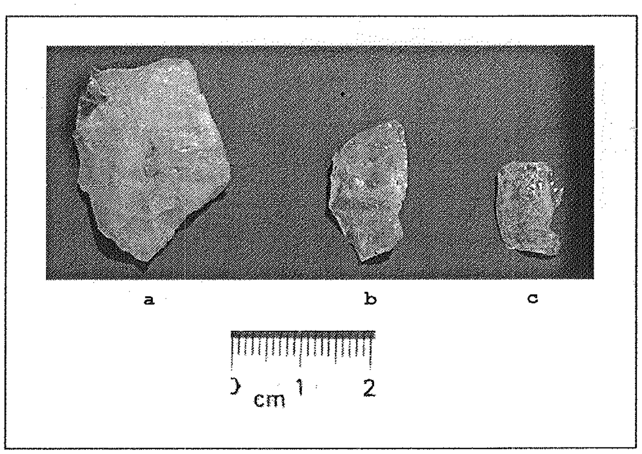

Figure 8.33: Component 2 Quartz Crystal

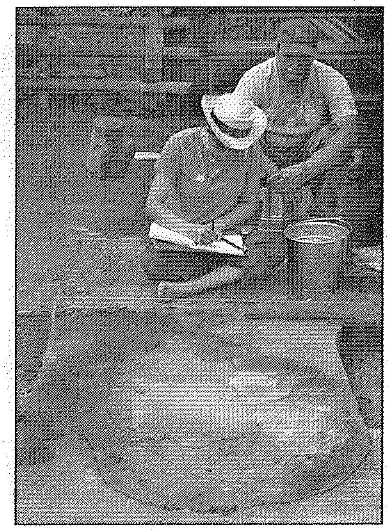

Figure 8.34: Modern Burn Deposit (intrusive)

A trench–like feature extending from 9–11 North by 252–259 West consisted almost entirely of dark organic sediments with butchered animal bone and some fire–cracked rock, but very few lithics. No historical artifacts were found in this feature and the faunal remains exhibited no evidence of metal tool marks (i.e. saws) but only butchering marks consistent with stone tools. As such, it is likely that this feature dates to the later pre–contact (component 2) times.

Historical Artifacts. Historical, 19th or early 20th century, artifacts consisted of two corroded ferrous buttons, a silver and pearl collar stud and a corroded ferrous suspender clasp (see Figure 8.35). Both were located in mixed dung and anthropogenic sediments from 0 to 5 cm below surface.

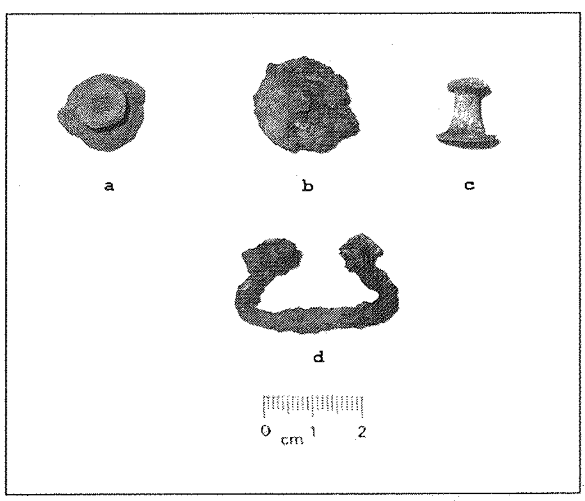

Figure 8.35: 19th Century Artifacts

Pre–contact artifacts. Table A.18 lists all diagnostic lithic materials recovered.

Table A.18: DhQx–10 Artifacts

							mm	mm	mm		
		Nrth	West	dbs	comp	length	width	thick	neck–width	material	description
Bifaces											
	a	12	255	30	1	129	55	16		chert, grey	Leaf–shaped
	b	10	254	25–30	1	82	38	11		chert, black	Leaf–shaped
	c	29.60	255.05	0 – 10	2	(49)	35	10		chert, grey	Leaf–shaped, broken
	a	12.74	255.05	30		(44)	26	7	15	chert, grey	Nespelem Bar
	b	9.50	149	30		(39)	(20)	(12)		dacite	leaf–shaped (tip section)
	c	8	255	25		30	11	4	9	chert, brown/white	Cascade C (?)
	d	11	252.58	0 – 10	2	(25)	12	5	8	chert, red/white	leaf–shape (missing base)
	e	6	252	0 to 5	2	(18)	16	3	7	chert, black	Plateau small side–notched (missing tip)
	f	6.90	255.28	9	2	(18)	13	3	7	chert, black	Plateau small side–notched (missing tip, lateral base)
	g	7.13	255.68	4	2	20	12	3	7	chert, translucent	Plateau small side–notched (missing base lateral tip)
	h	8	253	0 – 10	2	(15)	10	3	5	chert, white	Plateau small side–notched (missing tip)
	ii	12.14	255.34	0 – 10	2	(17)	13	3	7	chert, black	Columbia corner–notched B (missing tip)
	j	40	150	12	2	(21)	12	3	7	dacite	Columbia corner–notched B (missing base)
	k	7	255	0 – 5	2	16	10	3	6	dacite	Columbia Stemmed Series
	l	8	253	4	2	(17)	11	3	4	dacite	Wallula Rectangular Stem (missing tip)
Tips											
	a	6	252	0 – 15	2	(20)	17	4		chert, red	triangular, found while profiling
	b	8	255	0 – 10	2	(18)	(8)	2		chert, red	triangular
	c	6	255	0 – 5	2	(10)	(9)	2		chert, black	triangular
	d	8.60	255.25	0 – 10	2	(18)	(8)	2		chert, black	triangular
	e	10	247	0 – 10	2	(16)	(13)	4		pet wood	triangular, banded brown/white

							mm	mm	mm		
		Nrth	**West**	**dbs**	**comp**	**length**	**width**	**thick**	**neck–width**	**material**	**description**
	f	7	255	0 – 5	2	(12)	(12)	2		dacite	triangular
	g	12	255	20 – 30	1	(13)	(16)	5		quartz crystal	possible triangular tip
Medial											
	a	7	255	3	2	(27)	21	6		chert, brown	lanceolate mid–section
	b	7	255	0 – 5	2	(14)	12	3	6	chert, brown	possible Columbia corner–notched B point
	c	8 to 10	256 to 258	0 – 10	2	(16)	14	3		dacite	probable preform for Plateau small side–notched point
	d	10.83	252.47	9	2	(21)	11	3		chert, brown	probable small Columbia corner–notched B point
	e	8	256	0 – 5	2	(19)	(9)	2		dacite	straight, medial–lateral fragment
Base											
	a	5.15	254.25	6	2	(7)	14	2	6	dacite	Plateau small side–notched point base
	b	6.30	255.14	5	2	(12)	(15)	3		chert, grey/brown	Contracting stem
	c	10	255	0 – 10	2	(9)	(16)	5		chert, red	Contracting stem
Bone											
	a	6	266	0 – 10	2	(21)	(4)	3		incisor	beaver/marmot/muskrat (?), broken (1/2)
Unifaces											
	a	10	256	0 – 10	2	73	61	21		quartzite	side and end scraper on large flake
	b	6	252	5	2	42	14	3		chert, grey/white	Lateral retouch on bladelet
Misc											
	a	6	254	5	2	(9)	(5)	1		obsidian	small flake
QuartzCrystal	**a**	8	255	0 – 10	2					quartz crystal	shatter (5)
Quartz Crystal	**b**	7	255	5	2					quartz crystal	shatter (1)
	c	50	245	0 – 10	2					quartz crystal	shatter (1)
	d	7	255	0 – 5	2					quartz crystal	shatter (1)
	e	10	249	0 – 10	2					quartz crystal	shatter (1)
	f	12	256	0 – 3	2					quartz crystal	shatter (1)
	g	12 to 13	255	0 – 10	2					quartz crystal	shatter (3)

							mm	mm	mm		
		Nrth	West	dbs	comp	length	width	thick	neck–width	material	description
	h	8	255	0 – 10	2					quartz crystal	shatter (1)
	I	6	255	0 – 10	2					quartz crystal	shatter (2)
	j	6	254	4	2	13	9	2		quartz crystal	blade–like flake (1)
	k	7	255	0 – 10	2					quartz crystal	shatter (1)
	L	9.63	264.24	0– 10	2					quartz crystal	shatter
	m	12	256	3 – 10	2					quartz crystal	shatter (1)
	n	10	252	0 – 10	2					quartz crystal	shatter (1)
	o	10	253	0 – 10	2					quartz crystal	shatter (1)
Historic											
	a	12	256	0 – 3		12	12	6		pearl, silver (?)	collar stud, pearl inlay
	b	10	256	3 – 10		14	14	7		ferrous	Stud–button, corroded
	c	12.42	255.26	5		16	16	4		ferrous	stud–button plate, corroded
	d	12	256	0 – 5		31	20	4		ferrous	suspender clasp, corroded

Faunal Remains. Table A.19 lists all identifiable faunal remains recovered (C. Tarasca 2003: pers. com). The majority of identifiable remains originated in units found within the log corral. It is evident that deer skeletal elements predominate followed by elk and grouse. A single Bighorn sheep element was recovered from the only unit containing identifiable fauna outside the corral.

Table A.19: DhQx–10 Faunal Remains

Provenience/ Unit	Taxon	Element	Side	Fusion	Part	Age
8–10N 246–248 W	Deer	Ulna	R		distal	
8–10N 246–248 W	Med Mammal	Vertebra	I		neural arch frag	
8–10N 246–248 W	Unidentifiable	25 frags				
8N 255W	Deer	Carpal	R		complete	
8N 255W	Deer	Carpal	R		complete	
8N 255W	Deer	Ulna	R	U ep	distal epiphysis	26–35 months
8N 255W	Med Mammal	Atlas			fragment	
8N 255W	Unidentifiable	9 frags				
008N 256 W	Deer	Metatarsal	U		shaft	

Provenience/ Unit	Taxon	Element	Side	Fusion	Part	Age
008N 256 W	Med Artiodactyl	Innominate	L		ilium	
008N 256 W	Unidentifiable	9 frags				
10N 252W	Deer	1st Phalanges	U	F	proximal	
10N 252W	Med Mammal	Scapula	U		blade frag	
10N 252W	Grouse	Tibiotarsus	R		distal	
10N 252W	Unidentifiable	26 frags				
10N 253 W	Elk	1st Phalanx	U	F	distal	
10N 253 W	Deer	Tarsal	R		complete	
10N 253 W	Deer	Metacarpus	L	F	distal	
10N 253 W	Unidentifiable	3 frags				
11N 258W	Deer	Astragalus	L		complete	
11N 258W	Deer	Radius	R	U ep	distal epiphysis	N/A
11N 258W	Deer	Tarsal	L		complete	
11N 258W	Deer	Femur	R	U ep	proximal epiphysis	36–42 months
11N 258W	Deer	Femur	R	J	distal	26–42 months
11N 258W	Deer	Patella	L		fragment	
11N 258W	Deer	Ulna	R		distal	
11N 258W	Deer	Th vertebera	I	U	fragment	35–42 months
11N 258W	Med Mammal	Rib	U		shaft	
11N 258W	Med Mammal	Long bone	U			
11N 258W	Unidentifiable	8 frags				
12N 253 W	Unidentifiable	1 frag				
12N 256W	Grouse	Humerus	L		complete	
12N 256W	Grouse	Ulna	L		complete	
12N 256W	Grouse	Coracoid	L		proximal	
12N 256W	Grouse	Scapula	L		anterior	
12N 256W	Unidentifiable	3 frags				
12N 256W	Deer	Radius	R	F	distal	
12N 256W	Unidentifiable	32 frags				
12N 256W	Med Artiodactyl	Rib	U		shaft	
12N 256W	Med Mammal	Long bone	U			
12N 256W	Deer	Ulna	R	F	proximal	>26–42 months
12N 256W	Deer	Calcaneus	L	F	complete	>26–29 months
12N 256W	Med Artiodactyl	Innominate	L		ischium frag	
13N 255/254 W	Med Artiodactyl	Scapula	R		blade frag	
13N 255/254 W	Deer like	Th vertebera	I		fragment	
13N 255/254 W	Unidentifiable	8 frags				
40N 223W	Elk	Carpal	R		complete	
40N 223W	Grouse	Ulna	R		complete	
40N 223W	Grouse	Humerus	L		distal	
40N 223W	Elk	Radius	L	U	distal	3–4 yrs
40N 223W	Unidentifiable	2 frags				
40N 223W	Unidentifiable	1 frag				
40N 223W	Unidentifiable	5 frags				

Provenience/ Unit	Taxon	Element	Side	Fusion	Part	Age
40N 224W	Elk	Cranium	R		fragment	
40N 233W	Deer	Sesamoid	R		complete	
40N 233W	Med Mammal	Cranium	L			
40N 233W	Unidentifiable	3 frags				
40N 233W	Deer	Carpal	R			
40N 233W	Unidentifiable	6 frags				
40N233W	Unidentifiable	236 frags				
40N233W	Med Artiodactyl	2nd Phalanx				
50N 245W	Mountain sheep	Calcaneus	L	F	complete	

Recovered faunal remains consisted primarily of deer (NISP = 21), elk (NISP = 4), Bighorn sheep (NISP = 1), medium artiodactyls (NISP = 6), medium mammal (NISP = 7) and grouse (NISP = 7). Unidentifiable artiodactyls (NISP = 46) and unidentifiable mammal (NISP = 367) complete the inventory (NISP = 413).

Radiocarbon Assays. Three radiometric assays were conducted, one on the modern burn area previously described and two additional assays of cultural bone collage. A sample of deer elements from within the corral (Component 2) and a second sample of elk elements from a unit outside the corral (Component 1) were submitted.

Sample #1: Beta–183263

112.36 ± 0.56 pMC (< 50 BP: modern).

The sample contained a greater percentage of radiocarbon than the AD 1950 standard and dates 20th century burning activities extending into Component 2 strata.

Sample #2: Beta–185396

130 ± 40 BP

Cal BP 0–290 @ 1 sd (0.495 probability)

Cal AD 1804–1885 @ 1 sd (0.495 probability)

The sample effectively indicates a late pre–contact, or proto–historic, to early transitional historic occupation.

Sample #3: Beta–185395

2,290 ± 40 BP

Cal BP 2,307–2,348 @ 1 sd (0.669 probability)

Cal BC 358–399 @ 1 sd (0.669 probability)

The sample indicates earlier occupations dating between 2,000–2,500 BP. Other areas of the site, particularly the eastern end of the terrace, may contain earlier occupations based on depth of cultural deposits, but lack of diagnostic artifacts and organic material preclude establishment of age.

Site Summary

Due to time constraints and conditions set by the Lower Similkameen Indian Band dministration, little more can be written concerning the nature and significance of the Cool Creek (East) site unless materials can be temporarily taken off–Reserve for analysis. Permission has yet to be granted for this.

The site is a large open camp lacking evidence of habitation structures or surface features. The presence of fire–cracked rock hearth areas, formed tools, lithic debitage and identifiable faunal remains indicates occupation other than winter. Seasonality studies of recovered faunal remains, primarily deer and/or bighorn sheep, are required to assess seasonality. A preliminary estimate based upon assessed age at time of death for deer remains ranges from a minimum of 26 to a maximum of 48 months. The birth season for deer tends to be in May and June, consequently this data suggests seasonality of procurement ranging from early Spring (March/April) to late Fall (October/November)

Diagnostic artifacts and preliminary stratigraphic analysis of artifact provenience indicates multiple occupations of the site. Occupations appear to date approximately 200 to 500 years ago (Sxwalhani.t Phase 200–1,500 BP) as evidenced by materials located within the first 10 cm of the non–20th century sediments. Component 2, an earlier occupation, dates ca. 2,000–2,500 years ago or older (Snazai'st Phase 1,500–2,500 BP); deeper cultural materials excavated to the east of the corrals may represent Tcutcuwi'xa Phase (2,500–4,500 BP) or later Acnol'ux (4,500–6,000 BP) occupations.

Chain (DkRb–07) and Link (DkRb–02) Lakes Sites

Archaeological impact assessments of three Ministry of Forests recreation camps on Chain, Link and Osprey Lakes north of Princeton was conducted in 1998 in the Hayes Creek drainage. The south end of this drainage in the Princeton Basin contains several dozen pre–contact lithic scatters and other site types (Vivian 1989a). Comprehensive surface examination through pedestrian traverses and sub–surface shovel testing of the Link Lake and Osprey Lake recreation camps were conducted.

The terms of the Heritage Inspection Permit (#1998–251) required that minimal, rather than comprehensive, systematic surface collections within recreation camp boundaries be conducted in order to determine site significance. Only diagnostic artifacts (i.e. identifiable projectile points, other formed tools, cores and diagnostic bone, shell, antler, organic or historic artifacts) were to be collected. However, in a majority of instances surface artifacts were located within development zones and were collected rather than be subject to disturbance and/or loss. All surface collected artifacts were plotted on 1:500 scale MoF site maps and tied to reference datum points established within the recreation camp areas (Copp 1998d).

Evaluative testing was based upon judgmental location of test units. Each unit was placed within a development zone or immediately adjacent. Testing of planned impact and non–impacted areas within each recreation camp involved shovel tests consisting of 40 cm by 40 cm, as well as one meter square evaluative units, all excavated in 10 cm arbitrary levels. All cultural strata were passed through 1/8" (4 mm) screen mesh in order to aid recovery of small artifacts, ecofacts, floral and faunal remains or examined by hand sorting in lieu of screening.

Each forest recreation camp area was found to contain a single pre–contact archaeological site as determined by the presence of lithic materials. Diagnostic cultural materials were found at the Chain and Link Lake sites. The Chain Lake site exhibited a single Plateau small side–notched projectile point of arrow neck–width size (i.e. less than 10 mm) characteristic of the Plateau Late Pre–contact period as well as a probable point base of the same type (Figure 8.36).

Chain Lake (DkRb–07)

A single diagnostic basalt Plateau side–notched projectile point was located at the Link Lake camp. It exhibits attributes analogous with established projectile point typologies dating 1,500/1,800–2,000/2,400 BP in the Plateaus. No temporally diagnostic materials were recovered from the Osprey Lake camp area.

Archaeological materials were located at a single locus within the Chain Lake camp boundaries. Intact sub–surface cultural materials consisting entirely of basalt and cryptocrystalline silicate (CCS) materials were found within 20–30 cm of the surface over an area of about two meters square – designated test unit #2. Nineteen additional shovel test units were excavated throughout the site, with negative results.

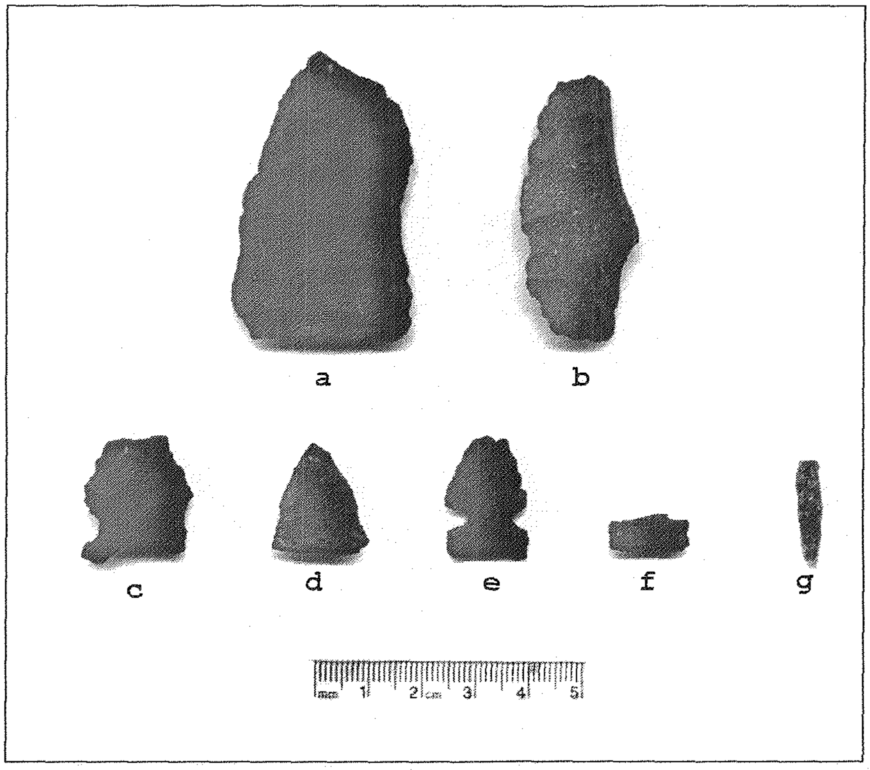

Figure 8.36: Recreation Camps Diagnostic Artifacts

Key:
a: biface (Osprey Lake, DkRb–06)
b: biface (Link Lake, DkRb–02)
c: Plateau side–notched point (Link Lake, DkRb–02), broken/unfinished
d: biface/projectile point tip (Link Lake, DkRb–02)
e: Plateau small side–notched point (Chain Lake, DkRb–07)
f: Plateau small side–notched point base (Chain Lake, DkRb–07)
g: microblade (Chain Lake, DkRb–07)

Lithic debitage recovered from test unit 2 numbered 977 flakes. Ninety–eight (98%) percent of these items are represented by cryptocrystalline silicates; a lustrous black with translucent veined chalcedony, a less lustrous black to purple chalcedony, and a tan chert. Basalts were represented by 29 items (3%) and were characteristically gray with medium crystalline structure. Flakes with intact striking platforms numbered 119 (12%). (See Table A.20). Over 90% of all flakes measured between 4 to 12 mm. Several biface thinning flakes (N = 7) were observed, all of cryptocrystalline silicates.

Ninety–nine percent of the above artifacts were recovered from depths of 2 to 20 cm below surface. One percent occurred between 20 to 30 cm below surface, indicating that all these materials most likely represent a single discrete activity area – one presumably used for core reduction and stone tool manufacture. Two projectile points were associated. One, an almost complete small side–notched variant is missing the tip section. The other point is represented only by the base section, which is thin and rectangular in shape and exhibits vestiges of two side notches. Both points fall within the arrow neck–width size criteria at 8 mm each (Figure 8.36). The majority of these cultural materials occurred within a band measuring 40 cm x 100 cm wide through the centre of the 1.0 metre square unit (N=714 or 73% of all materials recovered, including the two formed tools). This suggests that the majority of cultural remains result from a single activity (i.e. core reduction and tool manufacture) and constitute a "hot spot" within an otherwise pre–contact culturally sterile area.

Table A.20: DkRb–07 Test Unit #2 Cultural Material Analyses

	Material		Percussion		size range	
Type	ccs	basalt	hard	soft	(mm)	Total
Proximal	118	1	3	115	7–30	119
Non–proximal	812	17			4–29	829
Shatter	26	3			5–27	29
Totals:	956	21				977

Establishment of the time depth of these materials rests upon the single diagnostic projectile point recovered 10 to 20 cm below surface. Numerous excavations in the mid Fraser–Thompson, Nicola and Okanagan River regions attest to the presence of similar small, side–notched arrow points dating ca. 200–1,800 BP, characteristic of the Sxwalhani.t Phase in the Similkameen. This point type is consistent with Late Period arrow–size points dating ca. 200–1,800 B.P. (Richards and Rousseau 1987), the Chiliwist sub–phase III dating 900–1,800 BP (Copp 1979) and the Cassimer Bar Phase of 200–900 BP (Grabert 1970) of the Okanagan Valley.

Link Lake (DkRb–02).

Surface examination and sub–surface shovel testing revealed the presence of pre–contact lithic materials on both terraces of the Link Lake camp area. Cultural materials located on the lower terrace consisted of non–diagnostic flakes. The surface and sub–surface pre–contact materials from this area are considered to represent a diffuse lithic scatter representing casual use of the area. A total of 11 shovel tests were excavated, as mandated by time and funding constraints.

The surface and sub–surface cultural materials located on either side of the access road and concentrated in the southwestern portion of the recreation camp area represent a more intensive pre–contact use of the site area. Thirty–one surface lithic artifacts were recovered from this area alone. Additional lithic materials were recovered in each of the five shovel test units in the immediate vicinity of proposed camp activity areas, mainly at depths between 20 and 50 cm below surface.

The distribution of surface lithics indicates that most probably were dislodged from an original sub–surface provenience as a result of road construction, since they were found on the margins of the gravel and pebble road surface. Three formed tools, or portions thereof, were located within these disturbed deposits. They include a diagnostic dart–sized projectile point manufactured of basalt and a triangular basalt projectile point tip fragment found within 2 meters of the projectile point. A broken basalt leaf–shaped biface also was located on the western margin of the access road near a proposed camp activity area.

Previous Archaeology Branch Site Inventory Database forms for site DkRb–02 indicate the presence of one or two cultural depressions. Although variously described as "cultural depressions" or "garbage pits" it is evident that the larger depression measuring 4.0 by 5.0 meters is the remainder of an in–filled slough (L. Robertson, personal communication 1998). The smaller depression, measuring ca. one–meter square appears to fit the description of a garbage (refuse) pit, based upon field examinations.

The most diagnostic pre–contact artifact at the Link Lake recreation camp is the complete projectile point found on the margin of the access road near the camp sign post. Manufactured of vitreous basalt (dacite), it typologically resembles the Plateau side–notched point type although the broken nature of one side and unfinished opposite edge could mean that the point was originally intended as a corner–notched variant characteristic of the Sxwalhani.t Phase.

A second potentially diagnostic artifact is a microblade. Manufactured of cryptocrystalline silicate, it is missing the proximal end. It conforms in size, shape and diagnostic arris attributes to similar artifacts of the Plateau Microblade tradition. However, one microblade is not sufficient evidence to determine the presence of a Plateau Microblade tradition occupation at this site since no microblade cores or diagnostic core reduction sequence artifacts such as core rejuvenation platform flakes and/or primary flute surface preparation flakes were encountered. Microblade–like small, linear blade–like flakes may also be produced during flake core and formed tool reduction strategies.

The only diagnostic material located was at Chain Lake. It represents the *Sxwalhani.t Phase (200–1,500 BP).* The Chain Lake site consisted of a small (ca. four–meter square) area representing a lithic reduction area. It exhibited one complete small side–notched projectile point as well as a base fragment. The site represents an area of use for a brief time, possibly and hour or less, where materials were produced or re–worked associated with bow and arrow technology. Small Plateau side–notched points are indicative of the Sxwalhani.t Phase (200–1,500 BP).

Gold Dust Site (DhRd–04)

R. Muir and M. Rousseau (1992) conducted a site survey and shovel test project in the Similkameen Gorge area, including the Copper–Placer Creek areas. The surveys were part of a larger environmental impact assessment of a proposed hydroelectric project several kilometres upstream of the town of Princeton. Three pre–contact and four historic sites were identified and assessed for significance and mitigation should the hydroelectric dam be constructed at Deep Gulch Creek and flood the canyon upstream to Copper Creek. Of note was the presence of a microblades and microcore reduction flakes.

The gravel pit lies on two raised terraces above the Similkameen River between Placer and Belgie Creeks. The results of pedestrian walk–through survey of the Gold Dust gravel pit area resulted in the re–testing of the site. The initial 1992 project reported 15 shovel test units, ten contained pre–contact materials (see Figures 8.37 and 8.38). Five additional shovel tests were excavated on June 21, 1997 in to confirm the existence of buried archaeological deposits. All five units tested negative for pre–contact cultural materials. Another 16 shovel test units and a single 1.0 metre square test unit were excavated on July 17, 1997. These confirmed the existence of buried, pre–contact cultural materials. These excavations brought the total to 36 shovel tests and one evaluative unit (27N46E).

Diagnostic artifacts included complete microblades, distal microblade fragments, a medial microblade fragment, microblade core preparation flakes (*lames à crête*), microblade core rejuvenation flakes, one scraper and a single burinated chert flake. Non–diagnostic lithic debitage numbered 42 items. The total number of lithic artifacts recovered in 1992 and 1997 total 118 items (Table A.21). Adding the original 1,992 artifacts (N=10) brings the site assemblage total to 128 items.

Assignment to a temporal framework is difficult. DhRd–04 exhibits artifacts characteristic of the Plateau Microblade tradition (ca. 8,400–600/200 BP). A single small, leaf–shaped biface was reportedly found on the surface but could not be located. It cannot be confirmed to have been associated with sub–surface materials. Small leaf–shaped bifaces are found throughout the pre–contact culture sequence and cannot always be considered diagnostic of specific temporal periods.

This site represents a short–term logistical camp concerned with forays into higher altitudes or temporary camps by people traveling through the area (e.g., the historic Similkameen "Mountain Chief" Cosotasket's trapping area in the Skagit Valley). The hypothesis that the site represents specific foraging strategies (hunting, gathering or general resource procurement) appears to be the most elegant explanation.

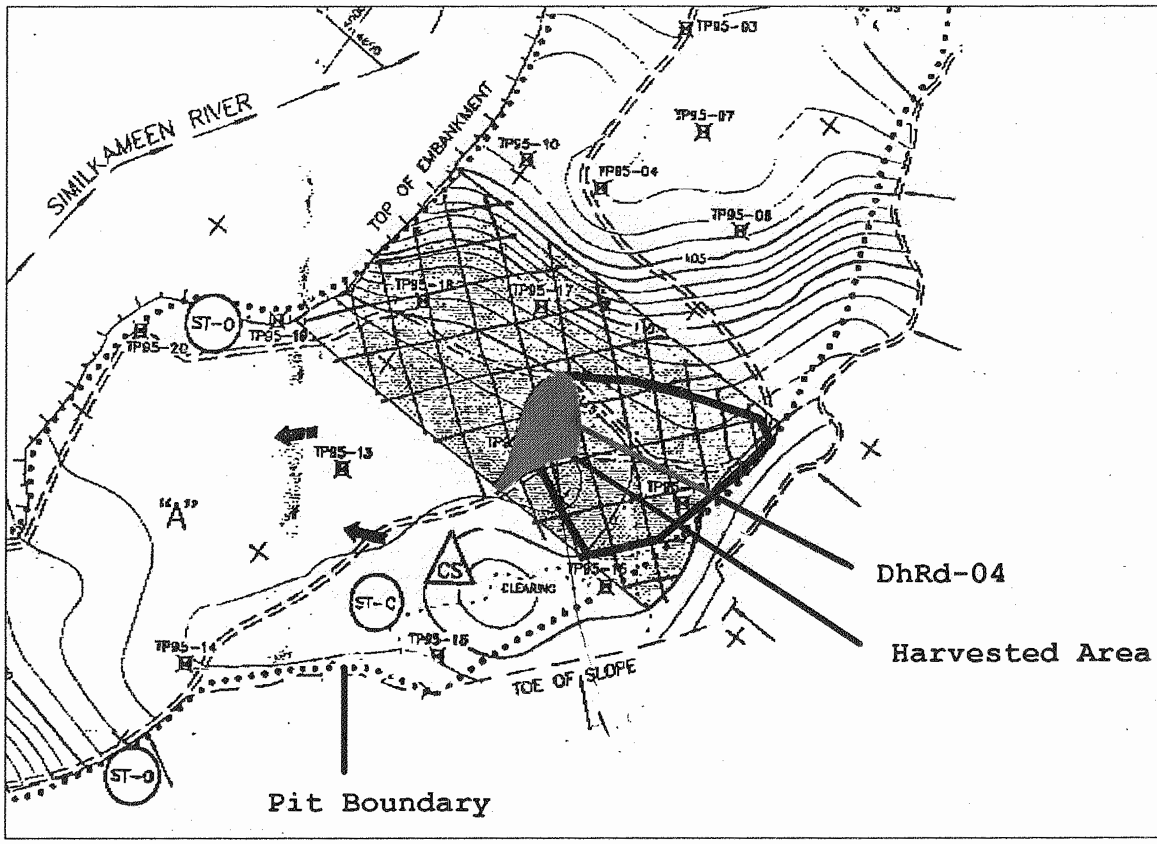

Figure 8.37: DhRd–04 Locale

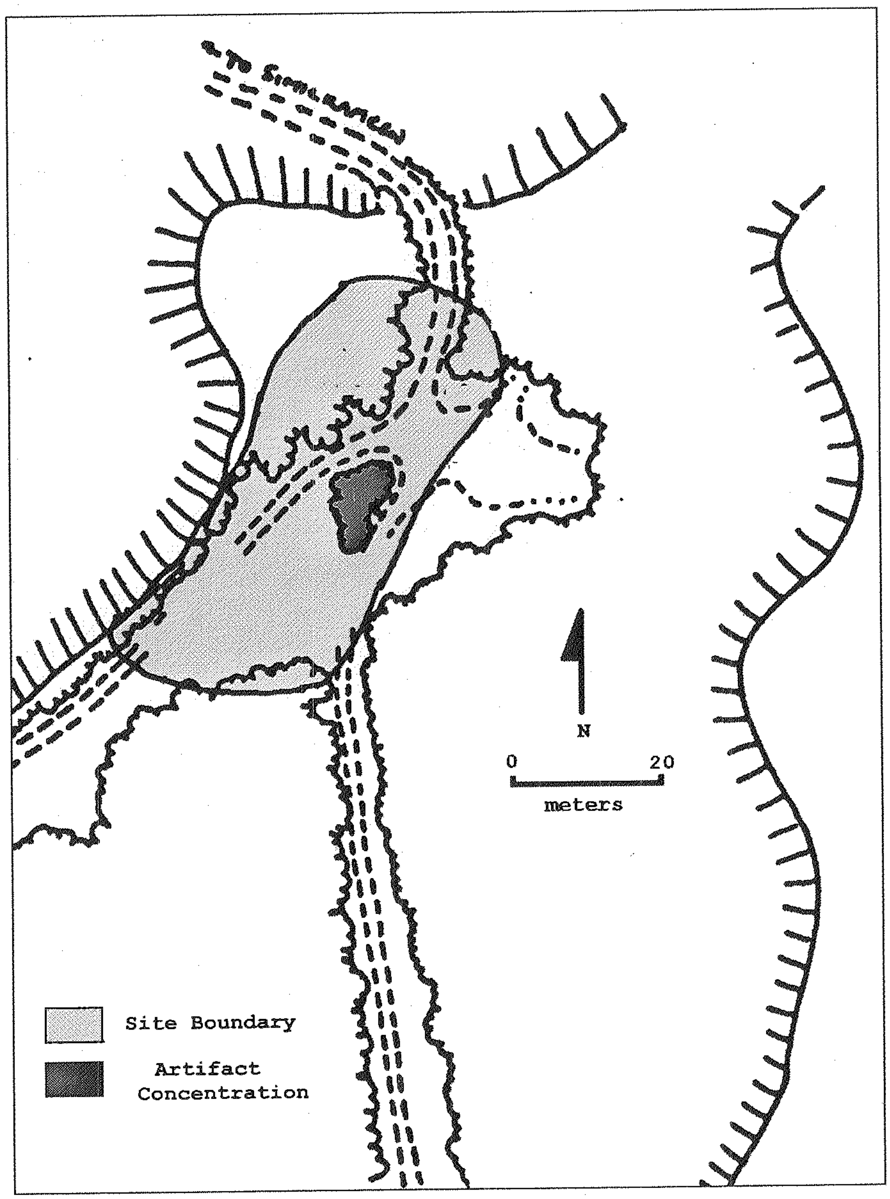

Figure 8.38: Site DhRd–04

(after Muir and Rousseau 1992)

Table A.21: DhRd–04 Artifact Distribution

North	East	#	Description
10	60	1	1 flake (hard hammer with cortex), chert
10	70	2	1 flake (core reduction, hard hammer), chert; 1 flake (debitage), basalt
14	37	3	2 flakes, chert; 1 flake, chalcedony
18	24	4	2 flakes, basalt; 2 flakes, chert
24	31	6	2 flakes, basalt; 2 flakes, chert; 2 flakes, chalcedony
27	46	79	3 microblade core preparation flakes, basalt; 1 microblade core preparation flake, chert; 1 microblade core rejuvenation flake, basalt; 1 microblade, basalt; 4 microblades, chalcedony; 3 microblade fragments, chert; 7 microblade fragments, basalt; 1 linear blade–like flake, basalt; 2 flakes, chalcedony; 9 core reduction flakes, basalt; 1 core reduction flake, chert; 1 core reduction flake, quartz; 2 pressure flakes, basalt; 7 pressure flakes, chert; 1 burinated flake, chert; 3 soft–hammer reduction flake, basalt; 13 flakes (debitage), basalt; 13 flakes (debitage), chert; 2 flakes, chalcedony; 4 flakes, quartzite
28	68	4	3 flakes, basalt; 1 flake, chert
30	60	2	1 flake (hard hammer debitage), chert; 1 flake (hard hammer debitage), chert
30	70	2	1 linear blade–like flake, chert; 1 flake (hard hammer debitage), basalt
30	78	2	1 flake, basalt; 1 flake, chert
37	14	3	1 flake, chert; 1 flake, chalcedony; 1 flake, rhyolite
38	43	6	6 flakes, basalt
38	72	4	1 chert unformed uniface; 1 flake basalt; 1 flake, chert; 1 flake, chalcedony
52	47	1	1 flake, basalt
55	70	1	1 flake (hard hammer debitage), basalt
55	80	1	1 core reduction flake (hard hammer), chert

The Copper Mountain Spring Site (DiRc–67)

The Copper Mountain Spring site (DiRc–67) was discovered as a result of an application of a predictive model developed for this dissertation research. Small–scale logging operations were to be conducted at the junction of two forest service roads situated adjacent to a mid–elevation wetland area in the headwaters of the Wolfe Creek valley. In accordance with Ministry of Forest policy, a referral was submitted to the Upper Similkameen Indian band to determine if there were heritage issues arising from the proposed logging operation. Band members familiar with the predictive model determined the area to have archaeological and traditional use potential based upon variables discussed in Chapter 5. Of particular note were the archaeological potential criteria of slope, aspect and proximity to a riparian zone.

Figure 8.39: DiRc–67

A preliminary field reconnaissance indicated that the area had been impacted by past logging, mining, ranching and contemporary hunting camp activities. In addition, a historic cemetery containing at least two graves was observed on the edge of the area identified as exhibiting archaeological potential (Gould et al. 2001). Several pieces of vitreous black chert debitage were observed on the surface near the hunter's camp, indicating that the archaeological site potential variables utilized in the project predictive model were accurate (see Chapter 5).

Based upon this information, a heritage inspection permit (#2000–352) was granted to conduct evaluative testing of the area to be impacted by forestry activities as well as a non–invasive pedestrian survey of adjacent locales.

The site is located at the intersection of two forest service roads some 17 kilometers southeast of the town of Princeton (Figure 8.39). Site boundaries extend from this intersection for 50 meters south and approximately 300 meters east towards the riparian zone. Additional site areas extending northwest of the intersection have been destroyed as a result of gravel quarry operations. The total site area is estimated to be 28 hectares in size. Steep slopes define the northern and southern site boundaries (Gould et al. 2001: 1–2).

The site is situated within the Interior Douglas Fir (IDF) bioecological zone, one of the lesser–known bioecological areas for archaeological sites in the valley. A large alluvial fan capped with colluvial sediments situated on the eastern site margin has potential for buried archaeological and palaeoenvironmental sites. Steep slopes with bedrock outcroppings form the northern site boundaries.

Eight 40 centimeter–square shovel test units were excavated within the proposed development area. Surface cultural materials included 19th and 20th century cultural materials including clay "pigeon" target fragments, fired rifle cartridge casings of various calibers, tin cans, spray paint cans and other materials left by hunters and/or campers. Other materials included fresh moose and deer hides. Historical land use features included ditches, roads, gravel quarrying, berm construction, latrines and corrals. All are indicative of heavy use of the eastern portions of the site. Sediment exposure areas revealed mixed deposits from 0–15 cm below surface with fire–cracked rock, historical glass and metal fragments, charcoal and decomposing wood.

Cultural Stratigraphy. Cultural strata were as follows:

Stratum 1: dark grayish brown (10YR 4/2), silty–sand, grasses, clover, strawberries, weeds and root hairs with scattered charcoal and fire–cracked rock, pre–contact cryptocrystalline lithic debitage: 0–5 cm below surface,

Stratum 2: dark grayish brown (10YR 4/2), moderately compacted silty–sand with 10% angular pebbles, fire–cracked rock, scattered charcoal, historical glass and pre–contact lithics: 5–20 cm below surface,

Stratum 3: dark grayish brown (10YR 4/2), compacted silty–sand with 25% angular pebbles and pre–contact lithics: 20–35 cm below surface, and

Stratum 4: dark brown (10YR 3/3), loosely compacted sandy–gravel with semi–angular pebbles, non–cultural: 35–50 cm below surface (Gould et al. 2001: 5).

Diagnostic Artifacts. A diagnostic Windust–style projectile point base was recovered as a surface find during pedestrian reconnaissance of portions of the site in proximity to the spring (Figure 8.40). Two Windust Phase (8,000–11,000 BP) projectile points have been recorded within the Canadian portion of the Similkameen Valley (Chapter 6). A third Windust–style point has recently been reported (B. Gould, personal communication 2000) from a private collection south of Chain Lake in the Hayes Creek drainage north of Princeton. Other examples have been reported in the Palmer Lake vicinity of Washington State (Salo 1987).

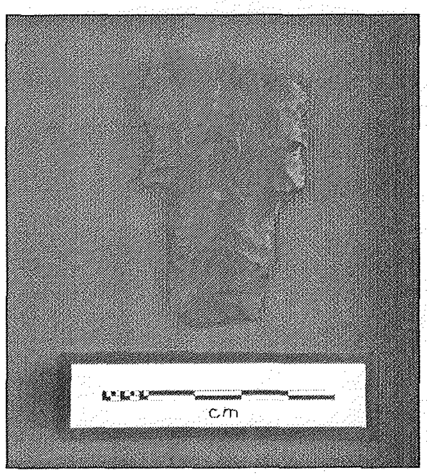

Figure 8.40: Windust Projectile Point Base

Table A.22: Windust Projectile Point Base Measurements

Material:	Vitreous chert, black with crystalline intrusions
Length:	(5.9) cm (broken – transverse fracture)
Width:	3.6 cm
Thickness:	0.8 cm (average)
Neck–width:	2.3 cm
Notch–width:	3.3 cm
Base width:	0.3 to 0.7 cm (base to shoulder)
Edge–grinding:	Light, along lateral base stem margins

The presence of Windust, Lind Coulee and at least one other PalaeoIndian projectile point type from various Similkameen Valley situations is strong evidence for the presence of early sites ranging from valley bottomlands to sub–alpine zones. This is the Nxacin Phase of the Similkameen Valley. Future research should be oriented towards documentation of such occupations.

The Red Ants Site (DiRa–24)

Pinto Flats, part of the Chuchuwayha Indian Reserve, consists of four ancient (Pleistocene to early Holocene) alluvial river terraces that form a large bend in the Similkameen River. The decision to allow excavation was made by the Chief and Council of the Upper Similkameen Indian Band and granted subject to the signing of a band heritage inspection permit. This permit system is similar, but more rigorous in terms, to the B.C. government heritage inspection permit system.

The Red Ants (DiRa–24) archaeological site lies entirely within the boundaries of the Reserve, which is federal land, so it falls outside provincial jurisdiction. Consequently, the band prefers to administer its own heritage inspection and permitting system under the auspices of the Indian Act. Conditions of the First Nation heritage permit required that no cultural materials, save sediment and radiometric samples, be removed from the site proper. All non–diagnostic artifacts were reburied on–site.

Four areas were laid out for investigation. Two were located on the lowest terrace closest to the river, one on a middle terrace at the head of an ancient channel bar ("island") deposited either in the late Pleistocene or very early Holocene, and a third area situated on the highest (oldest) terrace (Figures 8.41 and 8.42).

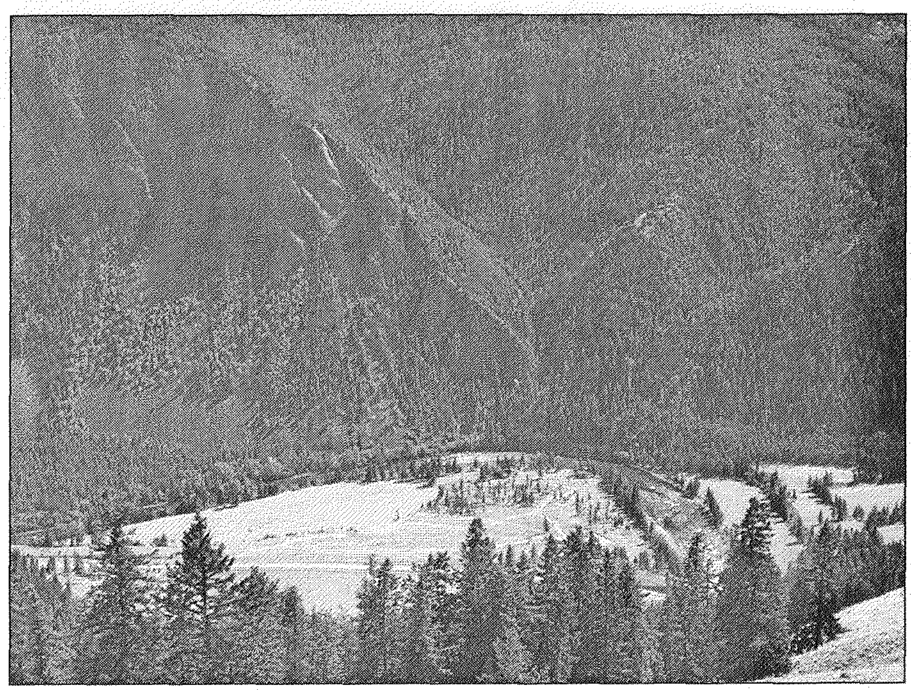

Figure 8.41: Pinto Flats

Eight, two meter–square excavation units were excavated. Five were located on the lowest (most recent) terrace and provided evidence of significant buried occupations. Three units were placed near the surface finds of two diagnostic Cascade projectile points (Figure 8.43). Two additional units were placed in areas where diagnostic surface materials dating from approximately 500 to 2500 years in age were found. One excavation unit was placed on a middle terrace near an ancient river formation. It exhibited shallow sediment deposition on the order of 40 cm in depth over river cobbles and boulders with no cultural materials. Two excavation units were placed near a surface finds of a small leaf–shaped Cascade point on the upper terrace.

Figure 8.42: DiRa–24 terraces

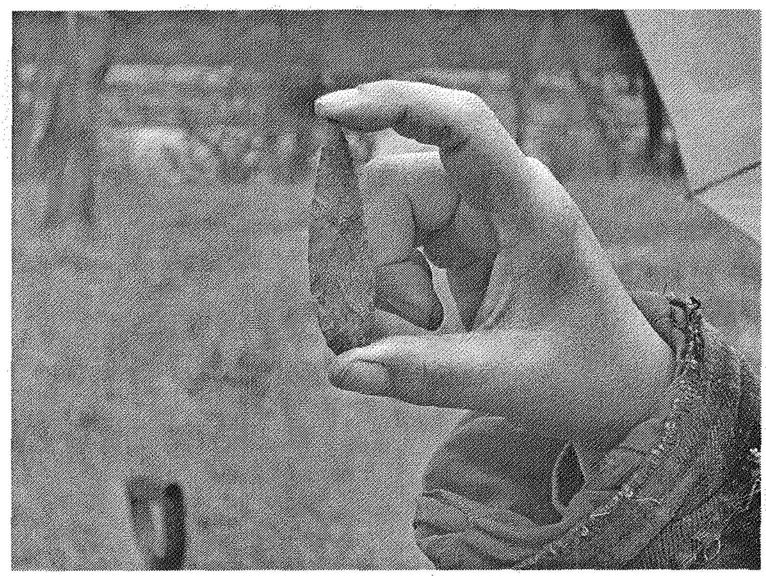

Figure 8.43: Cascade C point, lower terrace

Except for the excavation unit on the middle terrace, all produced significant finds in the form of formed tools, lithic debitage, burnt and unburnt ungulate bones, and a single subsurface hearth feature consisting of clustered fire–cracked rocks.

Radiometric Assay. A single radiometric assay was obtained on culturally modified ungulate bone originating in a hearth feature on the lowermost terrace:

Beta–168683: **4,750 ± 40 BP**

Cal BP 5,503–5,583 @ 1 sd (0.733 probability)

Cal BC 3634–3554 @ 1 sd (0.733 probability)

The presence of three Cascade point types is in congruence with this age estimate, within in the later Acnol'ux Phase. Of interest were the results from the two units situated on the upper terrace. Pre–contact archaeological materials were located from approximately 15 to 50 cm below surface. Artifacts manufactured from light green cherts were very different from those of the lower terrace were mostly basalts (dacite) and CCS (Figure 8.44). In addition, both units exhibited a dense 20–25 cm thick culturally sterile alluvial debris (mud, gravel and cobble) flow at a depth of about 50 cm below the modern surface (Figure 8.45). Silty–sand deposits continued below this significant land–altering event to a depth of 150 cm below surface.

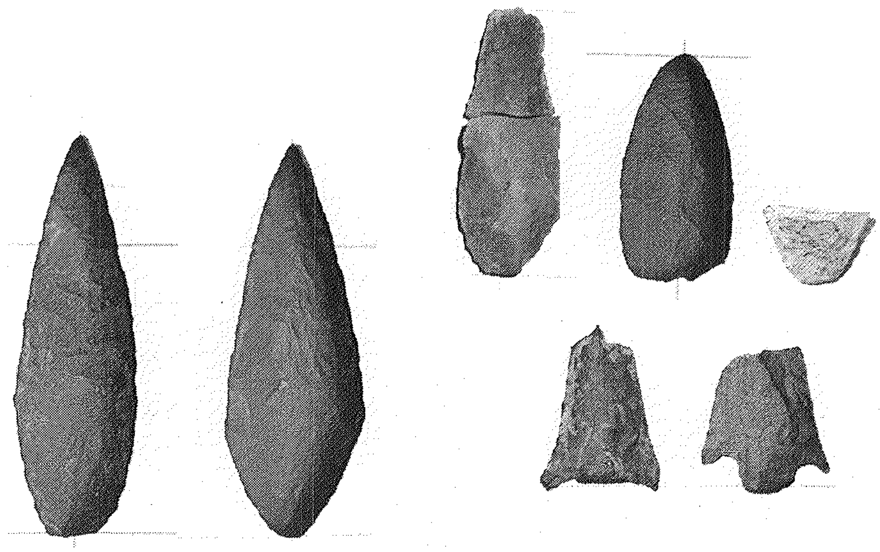

Figure 8.44: DiRa–24 Diagnostic Artifacts

Key:

Lower left: Cascade C points (2)
Upper right: Leaf–shaped points (2), Rabbit Island base
Lower right: Quilomene basal–notched, Columbia corner–notched B

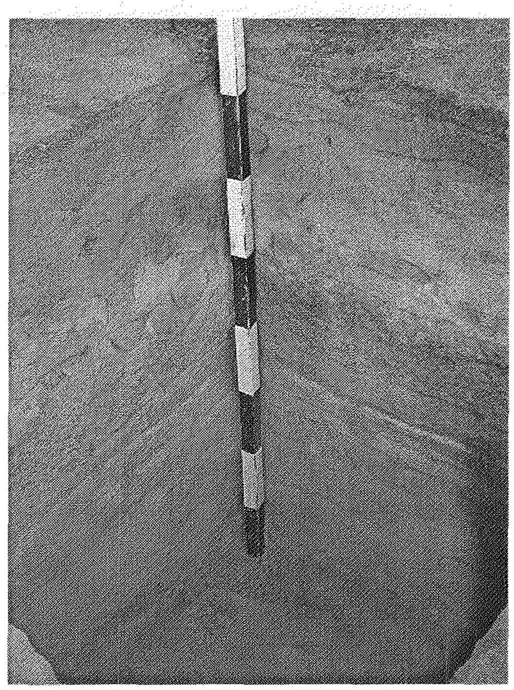

Figure 8.45: DiRa–24 Upper Terrace Stratigraphy

Note: Alluvial debris lens at 25–35 cm below surface

Red Bridge Camp (DhRa–13)

Six Ministry of Forests (Penticton Forest District) recreation camps situated on the Ashnola River were scheduled for upgrading (see Figure 8.46). Unfortunately, upgrading was conducted on three of those camps prior to implementation of fieldwork due to a misunderstanding about scheduling that occurred among the contractor (Itkus), Ministry of Forests (Penticton District) and the Lower Similkameen Indian Band. The six forestry recreation camps are located along a seven–kilometre section of the Ashnola River. Systematic pedestrian traverses, shovel and evaluative testing revealed the presence of a pre–contact site at the Red Bridge Camp (DhRa–13).

Pedestrian field traverses coupled with shovel testing resulted in the discovery of a previously unrecorded, subsurface hearth, scattered lithics and two previously recorded cultural depressions for site DhRa–13. The existing Archaeology Branch site inventory database indicted two potential cultural depressions on the site, although one has since been destroyed. Additional cultural materials located by my work included a probable pre–contact talus pit and numerous circular stone hearths of presumed historical dates.

Twenty–eight (28) pedestrian traverses averaging four to five meters apart were conducted across the long axis of the camp. This number included five traverses west of the camp boundaries on the upslope side of the Ashnola forest service road. They were instigated for two reasons: 1) to investigate the upper portion of the river terrace and lower mountain slopes exhibiting potential for talus pit, culturally modified tree and trail features, and 2) to provide experience for students. No shovel tests were conducted west of the forest service road outside the boundaries of the recreation camp.

Earlier work by Ministry of Forests personnel prior to this fieldwork included excavation of two latrine pits and outhouse buildings as well as top loading gravels to form camping pads and access road areas. These activities resulted in some areas, primarily camp pad locations, becoming inaccessible for sub–surface testing, especially as the majority of these areas were in heavy use during the period of field work .

Cultural and Natural Stratigraphy. Stratigraphic profiles from shovel tests indicated that the terrace containing surface and sub–surface cultural materials generally consisted of 2 to 15 cm of medium brown sandy silts with rounded pebbles, underlain by 10 to 20 cm of light brown sandy silts with sub–round to round pebbles, in turn underlain by light grey coarse sands to an unknown depth. Cultural materials were located within the first 2 to 15 cm of sands with the exception of the basin–shaped hearth beginning ca. 15 cm below surface and extending to 37 to 40 cm below surface.

Cultural Depressions. The smaller of two previously recorded depressions is located south of an S_1 stream at the southern end of the camp. Measuring 2.1 metres in diameter by 0.40 meter deep, it may represent pre–contact or historical use of the terrace (T_2). As it lay beyond the boundaries of the proposed camp development it was not tested. The larger reported depression located further north could not be relocated. It is suggested that it has been eradicated by sediment removal activities. A number of large pits and mounds were noted north of the smaller depression for a distance of approximately 50 meters.

A small cultural depression measuring 2.0 meters in diameter by 0.65 meter in depth was located in a small talus landform on the slopes west of the research area. It matches the configuration of small talus pits observed in other areas of the Similkameen, Nicola and Okanagan Valleys. No testing was undertaken of this feature as it lay outside the boundaries of the impact zone of the camp. This feature may represent a cache pit, or human or animal burial feature.

Cobble Hearth Features. At least 24 cobble circular hearth features of 1.0 meter diameter or less were observed on the terrace (T_2) west of the forest service road. No records were made of the hearths as they most likely post–date AD 1846, probably representing historical use of the area by First Nations and others. Prior to development of the forest service road a rough four–wheel drive track provided access to the area, and earlier the area was accessible on–foot or horseback (R. Dennis, personal communication 2001). The occurrence of this number of hearths suggests the area served as a waypoint or staging area for trips into the Ashnola River watershed prior to the development of the forest service road. Staging area camps where some members of the community remain while others travel into difficult terrain are not unknown ethnographically. A series of camps are still in use along the Ashnola River, some have been turned into camp grounds.

A random shovel test unit near the downstream portion of the site revealed quantities of burnt ungulate bone. The density of cultural material suggested the presence of a subsurface feature. This was verified by expanding the 40 cm–square shovel test into a 100 cm–square evaluative unit. Further excavations revealed a circular hearth feature measuring approximately 60 cm diameter extending 35 cm below surface. Although no diagnostic lithic materials were present in or around the hearth it contained a mid–section of a lithic biface, dacite and

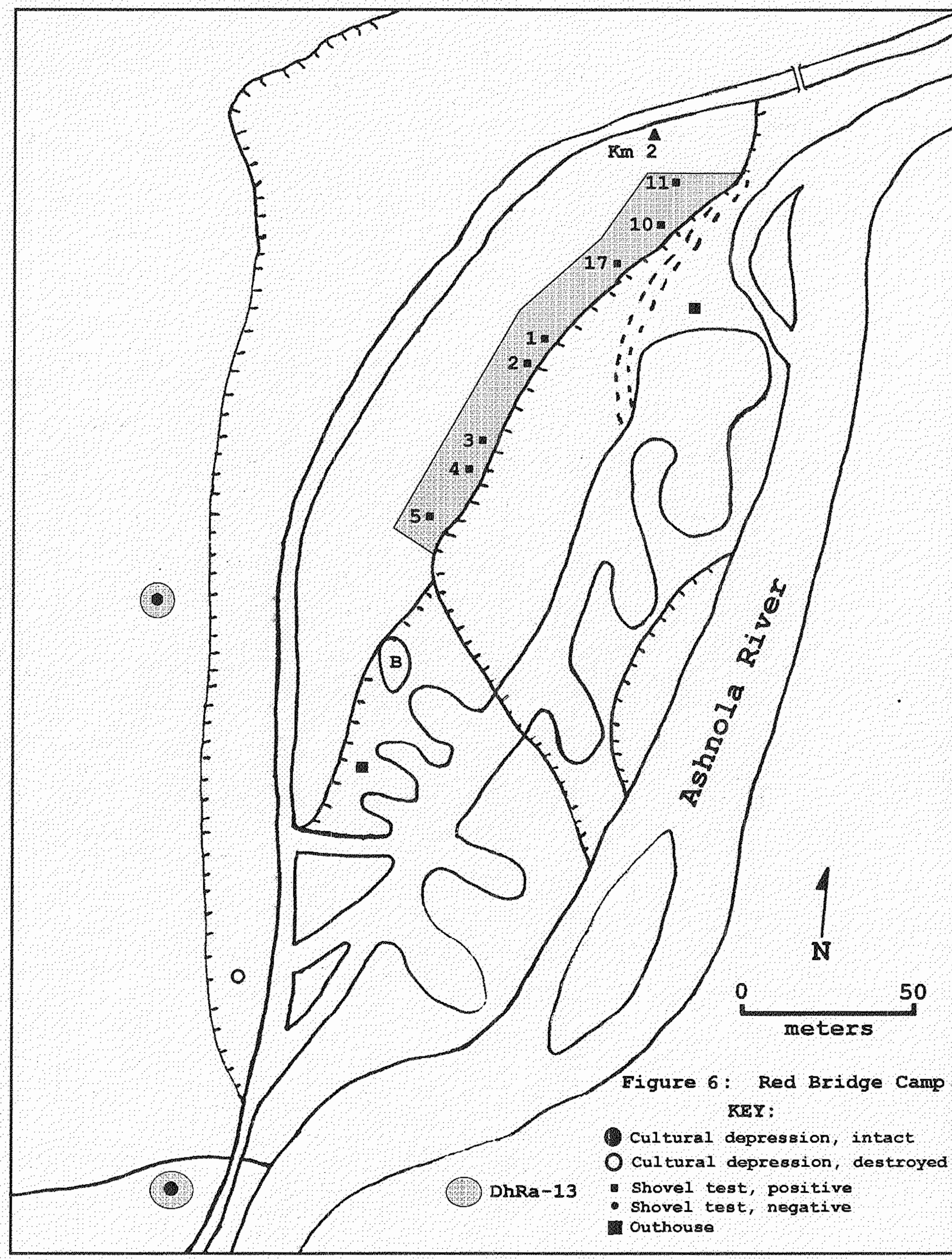

Figure 8.46: Site DhRa–13

cryptocrystalline silicate debitage, burnt and calcined ungulate bone fragments, fire–cracked rock and charcoal.

Lithic Assemblage. The lithic inventory is very limited as only 24 flakes and 1 biface fragment were recovered from a total of four shovel tests and one evaluative unit. The single chert biface mid–section located in the evaluative unit (#17) appears to be a fragment of a larger tool or a projectile point. It measures 2.8 x 2.3 x 0.7 cm (length/width/thickness). Twenty–three of the flakes recovered measure less than 8 mm in size and represent late stage reduction strategies. The single larger flake specimen measures 3.8 x 2.3 x 0.9 cm (length/width/ thickness). See Table A.23. Size ranges were determined by passing each sample through nested mesh screens (16, 8 and 4 mm).

Faunal Remains. Faunal remains were found in two units: #1 and #17. Shovel test unit #1 contained 11 fragments of calcined bone in addition to eight dacite flakes. Identification is not possible due to the small size of fragments (< 4 mm). The total weight of bone fragments is less than 1 gram. Evaluative unit #17 exhibited 237 grams of burnt and calcined bone fragments. These included diaphyses and badly smashed articular ends. Two very small phalanges and three articular ends were potentially identifiable. All 237 grams were recovered from the subsurface hearth feature in this unit.

Radiocarbon Assay. Burned and calcined bone fragments from the hearth feature were submitted for AMS radiocarbon assay:

Beta 168682: **580 ± 40 BP**

Cal BP 596–639 @ 1 sd (0.656 probability)

Cal AD 1311–1354 @ 1 sd (0.656 probability)

Table A.23: Sub–surface Lithics

Unit #	#	Material	Weight (gms)	Size: > 16/8/4 mm
1	8	Dacite	2	0/2/0
2	1	Dacite	1	0/1/0
3	1	Dacite	8	1/0/0
4	1	CCS	4	1/0/0
4	1	Dacite	1	0/1/0
17	12	Dacite	3	0/6/6

Site Summary

Although the Red Bridge camp provided only limited information, it did indicate the value of predictive modeling in the location of low density, small site types away from the main Similkameen Valley floor. It dates within the later portion of the Sxwalhani.t Phase.

Inland Pacific Connector Pipeline Project

Details of the predictive model applied to locate 53 pre–contact or historical sites within an 80 m–wide right–of–way for a proposed pipeline project are discussed in more detail in Chapter 5. Sites located within the boundaries of the Ashnola (IR #10) and Blind Creek (IR #6) Reserve lands were not assigned Borden numbers. They are included here as numerical designations. All sites were located within the first 42 kilometers of the 120 kilometer pipeline commencing in the Okanagan Valley to the Paul Creek drainage of the Hozameen range on the west side of the Similkameen Valley. A total of 48 pre–contact sites were located (Table A.24, Figures 8.47 to 8.54).

Table A24: Inland Pacific Connector Sites

Sacred sites (N = 2): #1 Coyote Rock, lithics, #22 (DhRa7) Coyote's Washbasin, lithics

Pictograph sites (N = 2): #s 20, 23 (lithics)

Surface Sites (N = 9): #s 4, 5, 8 (two cultural depressions), 11, 17, 26 (DhQx–35), 29, 34, and 36 (projectile point)

Evaluated sites (pre–contact) (N = 18): #s 2, 3, 6, 9 (DhQx–5), 10, 12, 13, 14, 15, 16, 18, 19, 24, 27 (DhQx–36), 30, 31 (DhQv–94), 32 (DhQv–95), and 33 (DhQx–36)

Cultural Depression sites (N = 2): #s 41, 42

Rock shelter sites (N = 3): #s 43, 44, 46

Talus Pit sites (N = 9): #s 28, 35, 47, 48, 49, 50, 51, 52, 53

Reported Burial sites (N = 5): #s 21, 37, 38, 39, 40

Historic Cemetery sites (N = 2): #s C1 Historic IR6 cemetery, C2 Historic plaque/boulder, ash burials

Historic Trail (N =1): # HBC , probable HBCo trail tread

Miscellaneous Historical Feature sites (N = 2): #7 cultural depression, square, historic; and #25 cairn (excavated, 20th Century land–clearing)

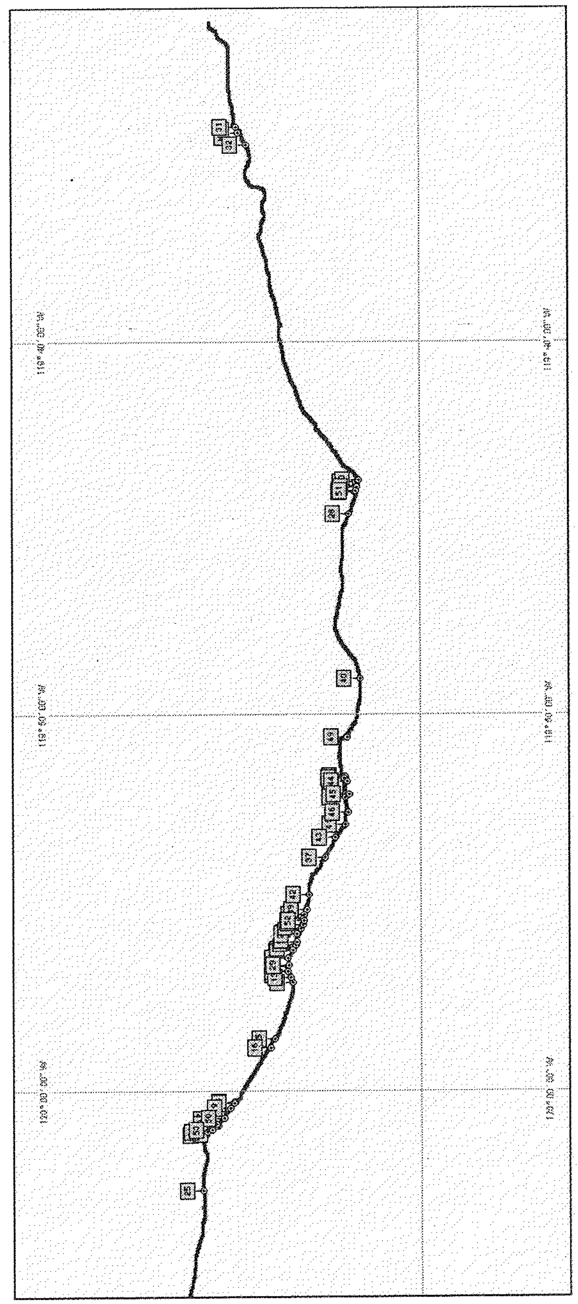

Figure 8.47: All Sites Located KP 0–42

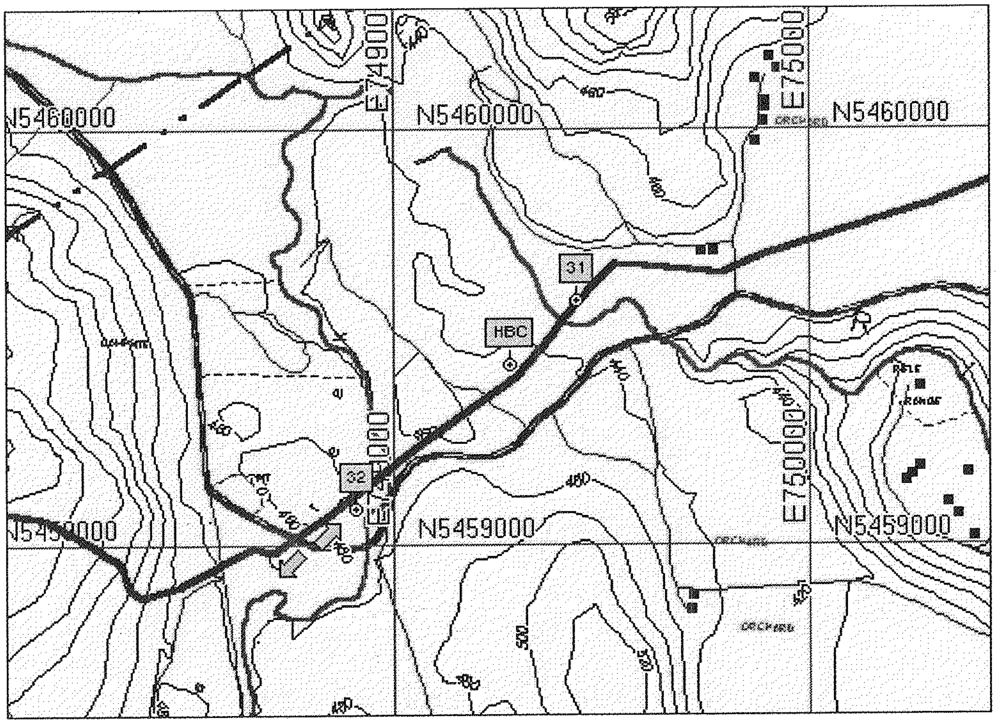

Figure 8.48: Map sheet 82E023 Sites

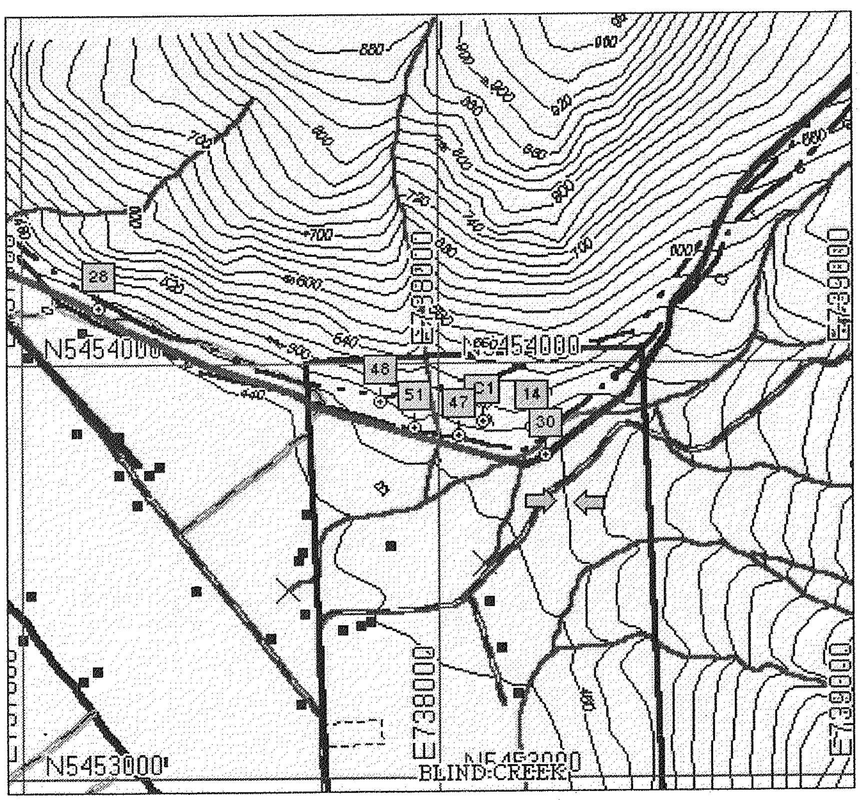

Figure 8.49: Map sheet 82E012 sites

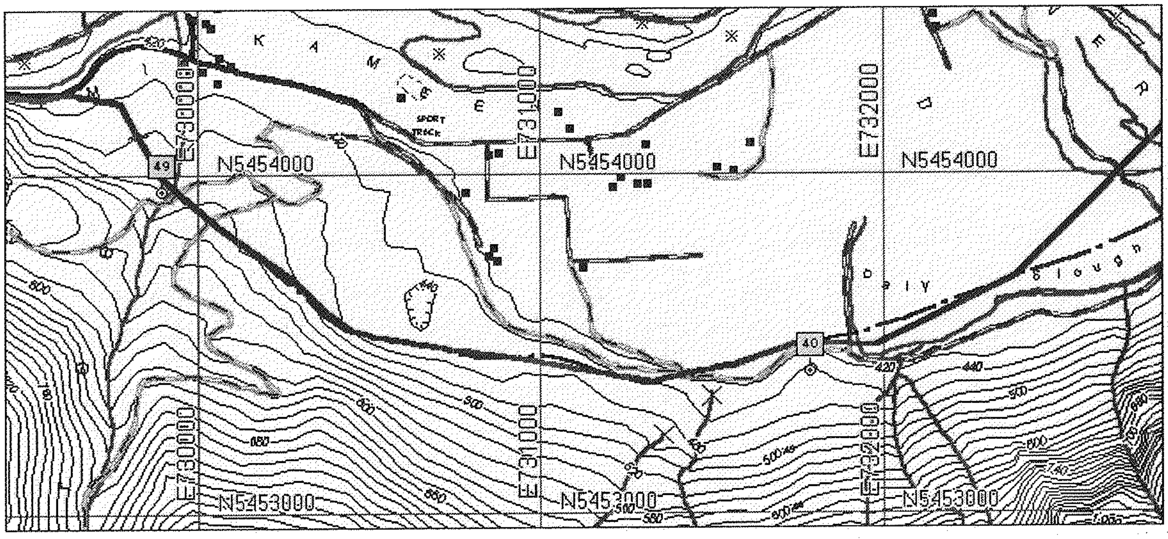

Figure 8.50: Map sheet 82E011e sites

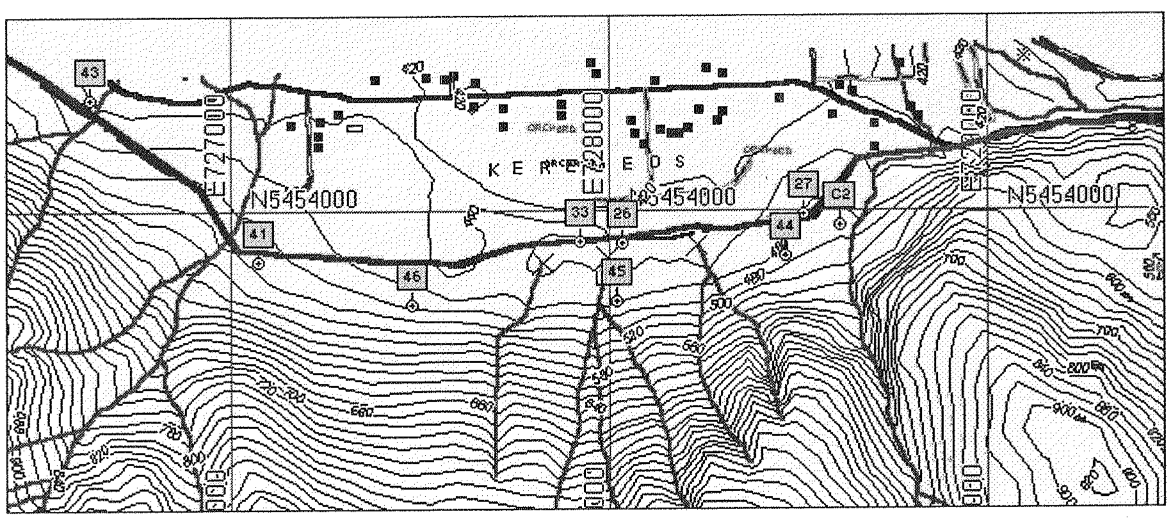

Figure 8.51: Map sheet 82E11w sites

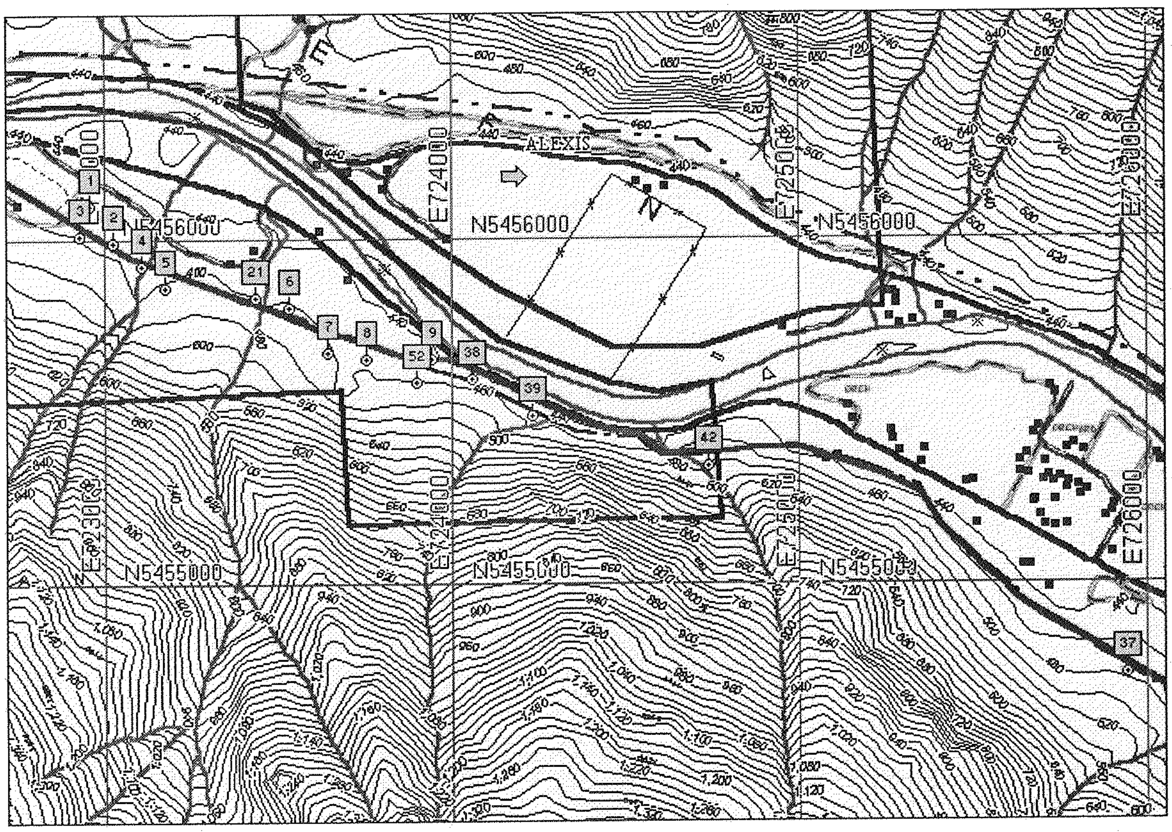

Figure 8.52: Map sheet 82E21e sites

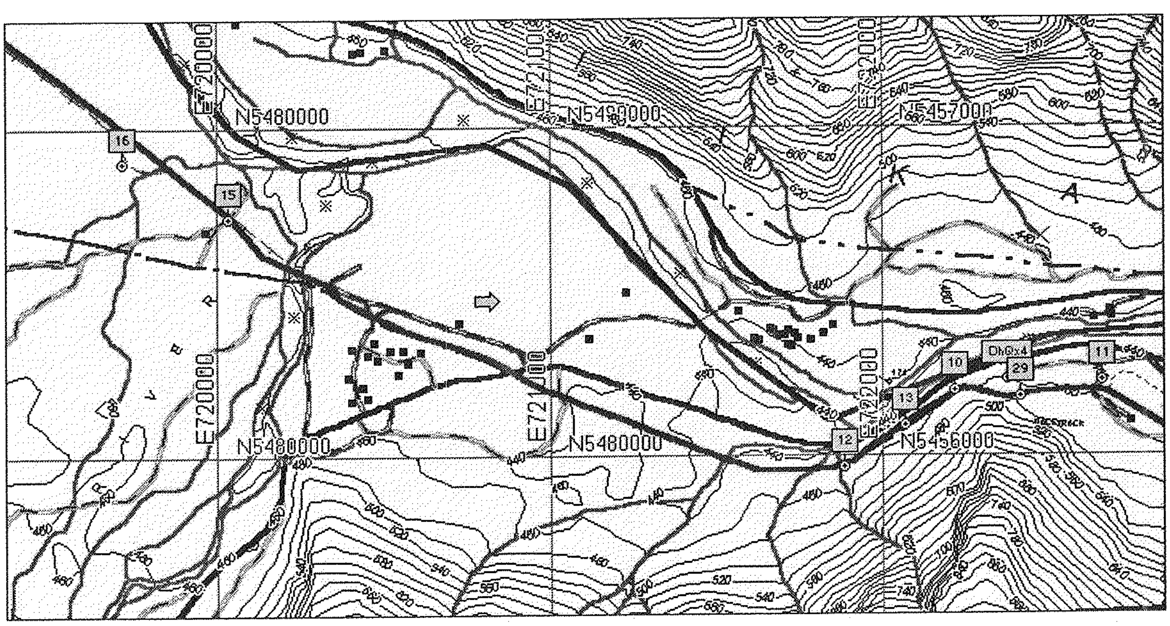

Figure 8.53: Map sheet 82E021w sites

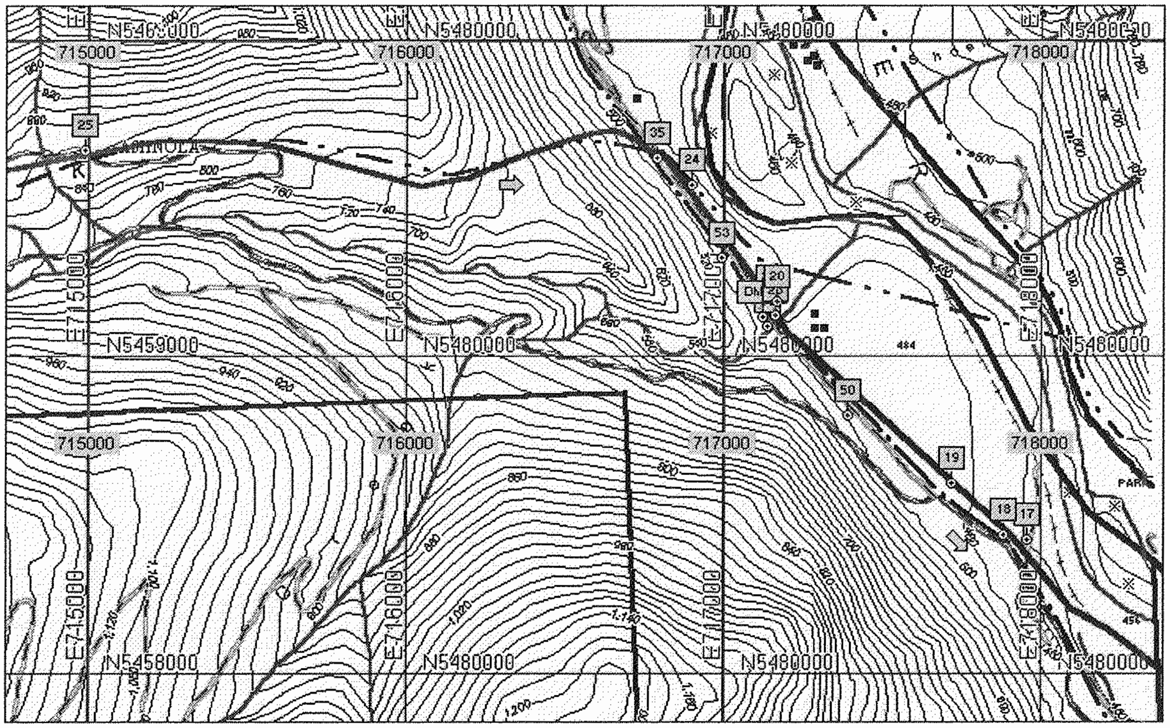

Figure 8.54: Map sheet 92H030 sites

Cultural Materials Recovered. A total of 41 unifacially or bifacially flaked lithic artifacts were recovered from surface surveys and shovel testing of 16 recorded sites found within the pipeline corridor between KP 0 to KP 45. Other materials recovered included 327 pieces of debitage, 211 fragments of bone, seven (7) shell fragments and one (1) fragment of modern ceramic (Table A.25).

Table A.25: Recovered Cultural Materials

Site	Flakes	Cultural material	#	Bone	Shell	Misc
DhRa–07		Projectile point, leaf–shaped	1			
IPC–02		Flakes	2			
IPC–09		Projectile point, contracting stem	1			
		Flake, unifacial retouch	2			
IPC–10		Flakes	4			
		Projectile point, medial section	1			
		Flake, utilized	1			
		Flake, retouched	1			
IPC–12		Flakes	41			
		Bone	40	40		
		Core fragment	1			
		Biface, preform	1			
		Projectile point, tip	1			
IPC–13		Flake, retouched	1			

Site	Flakes	Cultural material	#	Bone	Shell	Misc
IPC–14		Flakes	6			
		Projectile point, contracting stem	1			
		Flake, retouched	2			
		Projectile point, contracting stem	1			
IPC–15		Flakes	204			
		Core fragment	1			
IPC–15		Flake, retouched	1			
		Flake, unifacial & bifacial retouch	1			
		Biface, perform, leaf–shaped	1			
		Flake, utilized	1			
		Bone	27	27		
		Shell	7		7	
		Microblade	1			
IPC–16		Projectile point, contracting stem	1			
IPC–19		Projectile point, base	1			
IPC–23		Flakes	10			
		Bone	145	145		
		Flake, bifacial retouch	1			
IPC–24		Projectile point, tip	1			
		Projectile point, contracting stem	1			
		Biface, perform	1			
		Projectile point, side–notched	1			
		Flakes	5			
IPC–27		Core fragment	1			
		Bone	1	1		
		Flake	1			
IPC–30		Projectile point, base	1			
		Uniface, end scraper	1			
		Projectile point, side–notched	1			
		Projectile point, side–notched				
	1					
	1					
				1		
	2					
	1					
	4					
	2					
	2					
		Projectile point, corner–notched	1			
	1					

Site	Flakes	Cultural material	#	Bone	Shell	Misc
	2					
	2					
	1					
	2					
	1					
	2					
	1					
		Flake, retouched	1			
	2					
		Projectile point, base	1			
	2					
	1					
						1
				2		
				2		
				1		
IPC–31	4					
	4					
				1		
		Projectile point, corner–notched	1			
	1					
		Microblade	1			
		Microblade	1			
IPC–32	3					
	1					
	6					
		Microblade	1			
	1					
IPC–32	1					
IPC–33		Flake, utilized	1			
		Flake, utilized	1			
				1		
	1					
	1					
Totals	**327**		**41**	**211**	**7**	**1**

Lithic debitage primarily comprised moderate to good–quality dacites (basalts) and cryptocrystalline silicates (CCS). Dacites ranged in colour from grey to black whereas cryptocrystalline silicates consisted of a variety of colours including translucent, white, green, reddish–brown, red, orange, brown (tan), grey and black. Mottled colours were also observed, primarily white on black and red on brown.

Sources of raw material in the Okanagan–Similkameen are poorly known, but sources appear to be common throughout the Cascade and Hozameen Ranges (Ray and Dawson 1987). The most diagnostic raw material is a mottled cryptocrystalline silicate of various colours known as Allenby chert that derives from a source southwest of Princeton (Vivian 1989a). Single specimens of this material were observed in site assemblages at IPC–15, 24 and 32.

Only three specimens of non–dacite/ccs were located. These included two specimens of quartzite and a single grey obsidian flake recovered from site IPC–23. The obsidian obtained from IPC–23 has been identified by X–ray fluorescence (XRF) to the Obsidian Cliffs source in the Three Sisters Wilderness area of south–central Oregon (Dr. C. Skinner, personal communication 2002). Dacites and cryptocrystaline silicates comprised approximately 43% and 56% of the materials recovered, the three remaining materials encompass the remainder of the sample (see Table A.26.

Primary reduction strategies included both hard and soft hammer percussion. The majority of larger flakes (i.e. greater than 40 mm., Table A.27) exhibited hard hammer traits such as broad, flat striking platforms and thick cross–sections, whereas all smaller flakes exhibited smaller soft hammer striking platforms and thinner cross–section flake attributes. The relative frequencies of proximal flake sections (i.e. those retaining striking platforms), as well as high frequencies of small flake sizes and rare flakes retaining cortex, indicate that primary reduction strategies were not being conducted on site. Rather, secondary and tertiary activities were being conducted. These generally include activities such as flake production from small, previously used cores and tool manufacture and/or refurbishing.

Caution is advised concerning interpretation of the figures and analysis due to the effect on the sample of the larger site assemblage of IPC–15 containing 62% of the total material recovered.

Table A.26: Lithic Debitage Distribution (raw counts)

Site	Proximal	Distal	*Dacite*	*CCS**	*Other*	Total
IPC–02	1	1		*2*		2
IPC–10	3	1	*2*	*2*		4
IPC–12	12	29	*10*	*31*		41
IPC–13	1			*1*		1
IPC–14		6	*6*			6
IPC–15	51	153	*85*	*119*		204
IPC–23	4	6	*4*	*3*	*3*	10
IPC–24	2	3		*5*		5
IPC–27		1	*1*			1
IPC–30	8	22	*22*	*8*		30
IPC–31	3	6	*5*	*4*		9
IPC–32	4	8	*7*	*5*		12
IPC–33	1	1		*2*		2
Totals	90	237	*142*	*182*	*3*	327

**CCS = cryptocrystalline silicate*

Table A.27 Debitage Size Classes (mm)

	1	2	3	4	5	6	7	8	9	10	#
IPC #:	**>50 mm**	**45 to 49 mm**	**40 to 44 mm**	**35 to 39 mm**	**30 to 34 mm**	**25 to 29 mm**	**20 to 24 mm**	**15 to 19 mm**	**10 to 14 mm**	**<10 mm**	
2						1	1				**2**
10					1			3			**4**
12			2		2			16	17	4	**41**
13			1								**1**
14						1		1	1	3	**6**
15	1		3	1	9	6	15	31	77	61	**204**
23				1	1		1	5	1	1	**10**
24							3		2		**5**
27								1			**1**
30				1		3	3	5	12	6	**30**
31						1	2	2	2	2	**9**
32						3		5	2	2	**12**
33	1			1							**2**
Totals	2		6	4	13	15	25	69	114	79	327

Faunal Remains. Faunal remains were primarily small fragments of smashed ungulate bone (see Table 1). Potentially identifiable remains consisted of a single distal long bone epiphysis from IPC–23, the epiphyseal head of a femur from IPC–30 and a single tarsal bone from IPC–15. All appear to represent ungulates (deer, sheep or goat). Exceptions were a broken carnivore (dog or coyote?) tooth and fragments of freshwater mussel shell. The tooth derived from IPC–30, the shell from IPC–15.

Site Discussions. Two sites (IPC–31 and IPC–32) were located between KP 3.5 and KP 5.0 in the traditional territory of the Osoyoos Indian Band. Thirty–six sites were located between KP 17 and KP 45 within Lower Similkameen Indian Band territory. All most likely date between 200–8,000 BP based upon chronological indicators, mostly projectile points and microblades.

Site DhRa–07 (Coyote's Washbasin) is sacred site associated with one recorded surface artifact – a leaf–shaped projectile point that may pre–date 4,000 BP. Surface finds of lithics were also noted between DhRa–07 and Paul Creek and two pictograph boulders were located in the immediate area south of the existing pipeline. No pre–contact sites were found between KP 52 and KP 120 of Upper Similkameen Indian Band territory although several 19th to 20th century sites and features were located. None of the historic sites pre–date AD 1846 and, as such, are not protected by provincial heritage legislation. The most diagnostic artifact type recovered are projectile points. These, as well as rare microblades are discussed in the following section.

Projectile Point Chronology. Fine typological distinctions among Okanagan–Similkameen projectile point types are not possible due to small sample sizes, although Lohse's (1995) analysis of north–central Washington State sites has identified the most significant diagnostic attributes. A total of ten projectile points and two diagnostic point bases were recovered from surface surveys or shovel testing in the Similkameen Valley. The majority are complete enough to be identified by type can be confidently placed within a temporal perspective spanning the last 200 to 4,000 BP. One projectile point type, a leaf–shaped specimen, is more difficult to assess

Table A.28: Diagnostic Artifacts

Site	**Type**	**Subtype**	**Mat**	**colour**	**Size (mm)**	Comments
DhRa–07	projectile point	Cascade C	CCS*	black	(46)x24x8	leaf–shaped
9	projectile point	Rabbit Island	CCS	black	(31)x21x4	neck–width: 14mm
14	projectile point	Rabbit Island	CCS	black	28x20x6	damage to lateral edge; neck–width: 12mm
14	projectile point	Rabbit Island	CCS	black	33x18x5	neck–width: 12mm
15	Microblade	Plateau Microblade tradition	CCS	Brown	—	missing from collection
16	projectile point	Rabbit Island	CCS	black	29x18x6	incipient stem
24	projectile point	Plateau small side–notched	Dacite	black	(17)x13x4	straight base, missing tip; neck–width: 6mm
24	projectile point	Plateau side–notched	Dacite	black	30x16x5	expanding base; neck–width: 10mm
30	projectile point	Plateau small side–notched	CCS	black	(13)x11x2	neck–width: 6mm
30	projectile point	Columbia Corner–notched A	Dacite	grey	(17)x18x4	expanding stem, missing tip; neck–width: 11 mm
30	projectile point	Plateau small side–notched	CCS	black	(13)x(9)x2	missing tip, one lateral edge; neck–width: 6mm
30	projectile point	Wallulla rectangular stemmed	CCS	black	(13)x8x2	base, neck–width: 7mm
31	Microblade	Plateau Microblade tradition	CCS	red	(13)x8x2	proximal end
31	Microblade	Plateau Microblade tradition	CCS	brown	(10)x8x1	proximal end
31	projectile point	Quilomene corner–notched A	CCS	red–brown	43x21x5	expanding stem, neck–width: 8mm
32	Microblade	Plateau Microblade tradition	CCS	white	(18)x6x1.5	proximal end

*CCS = cryptocrystalline silicate

because this type can be found throughout the pre–contact sequence from ca. 2,500–3,000 to over 7,400 BP. The remaining specimens are either broken or incomplete examples that may have originated within a wide temporal span, but mostly within the last 3,000 to 4,000 years (see Tables A.28 and A.29 and Figure 8.55).

TableA.29: Site Diagnostic Projectile Point Age Estimates

Site	Minimum	Maximum	Diagnostic Projectile Point Type
DhRa–07	3000/4000	8000	Cascade C
9	1500/2000	3000/4000	Rabbit Island
14	1500/2000	3000/4000	Rabbit Island
16	1500/2000	3000/4000	Rabbit Island
24	150	1200/1800	Plateau small side–notched
24	150	1800	Plateau side–notched
30	150	1200/1800	Plateau small side–notched
30	150	2000	Wallula rectangular stemmed
30	1200/2000	2400/4000	Columbia corner–notched A
31	1200/2000	2400/3000	Quilomene corner–notched A

Projectile point neck–widths provide a general determination of type of weapon system utilized. A "rule of thumb" measurement separating smaller arrow from larger dart points has been established (Lohse 1995) with dart point neck–widths averaging greater than 10 mm. Contracting stemmed point types located in sites IPC–9 and IPC–14, as well as two corner–notched variants in IPC–30 and IPC–31 measure 10 to 14 mm, within the accepted range for dart points.

Although Plateau age estimates for the replacement of the earlier atlatl–dart system with the bow and arrow vary from as recently as 1,200–1,800 BP, it is likely that both were used during a period of transition to complete bow and arrow use. As such, it is likely that most of the sites reported here, with the exception of DhRa–08, fall within the last 3,000 to 4,000 years of Okanagan–Similkameen prehistory.

The Plateau Microblade Tradition (PMt). Microblades have been reliably dated in the Okanagan–Similkameen from approximately 1,800 to 7,400 BP (Chapter 8). Although no dated specimens from the area post–date ca. 1,800 BP, evidence is mounting that this simple, but sophisticated tool complex also was utilized on the Coast and in the Interior until as recently as 600 (Chapter 8). As such, microblades can be expected throughout almost the entire span of known pre–contact occupations in the Okanagan–Similkameen. Four microblades were found in three sites (IPC–15, 31 and 32).

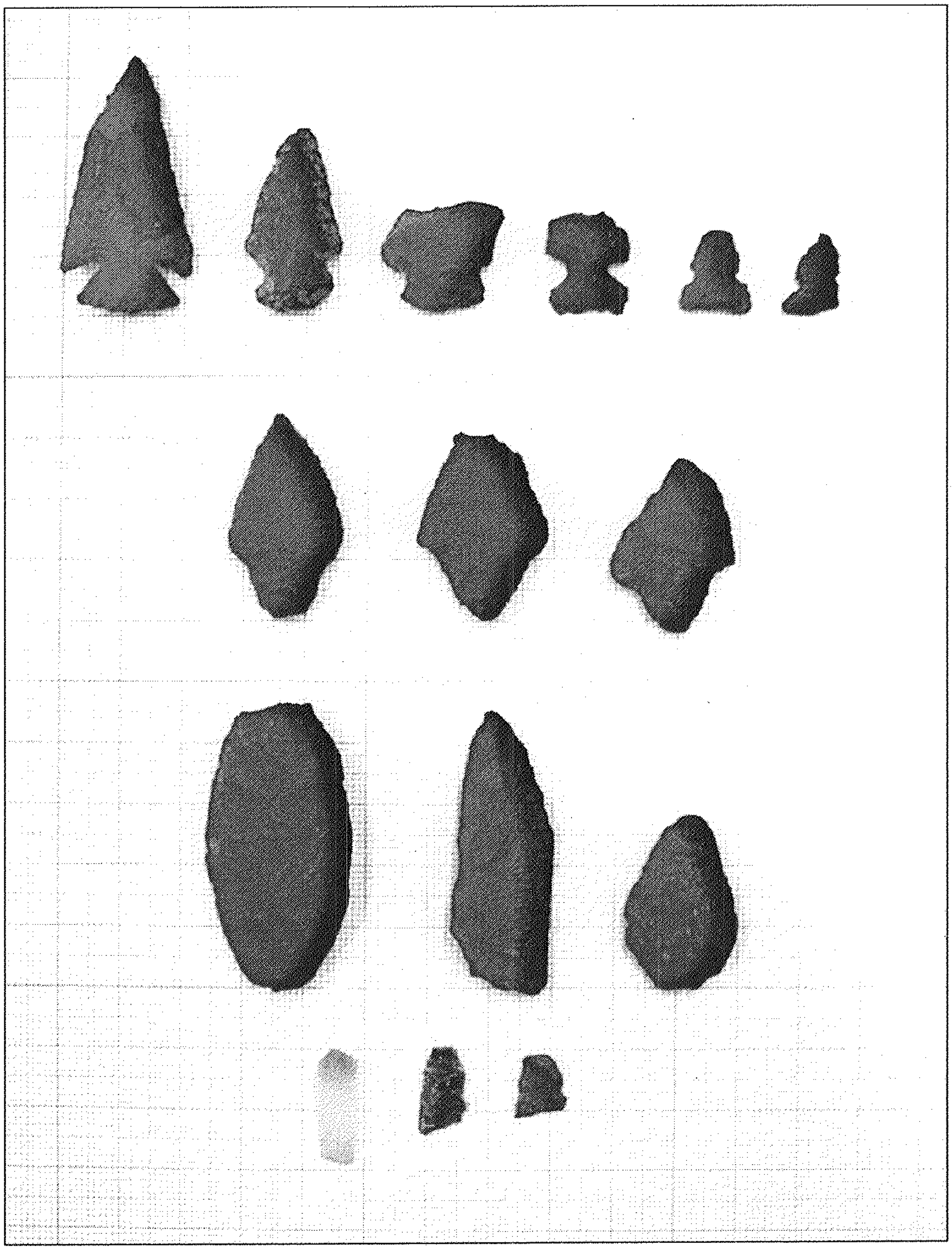

Figure 8.55: IPC Diagnostic Artifacts

Key:

Upper row:	Columbia corner–notched A, Quilomene corner–notched A, Plateau side–notched, Plateau small side–notched (3)
2nd row:	Rabbit Island B (3)
3rd row:	Cascade (leaf–shaped), biface, Rabbit Island (perform)
4th row:	Microblades (3)

DhQw–35: Found Human Remains, Keremeos, B.C.

On 14 June 2006 human skeletal remains were fortuitously uncovered during housing subdivision excavations in Keremeos, B.C. Skeletal elements (Figure 8.56) were retrieved under Heritage Inspection permit #2006–219, Ministry of Sustainable Resources, British Columbia. Evidence from systematic excavations indicated that approximately 85% of the skeleton had been disturbed prior to being displaced in 2006. Prior disturbance is likely the cause for loss of post–cranial skeletal elements. The remains are those of a young, probably pre–contact or proto–historic First Nations woman estimated to have been between 15 and 20 years of age. Pathologies included asymmetric long bone fusion of the left and right limbs and some scoliosis of the fifth lumbar vertebra. Grave goods included 40 perforated sheep incisors and 12 complete dentalia shell beads. Other shell beads were present, but had been crushed during removal by heavy equipment.

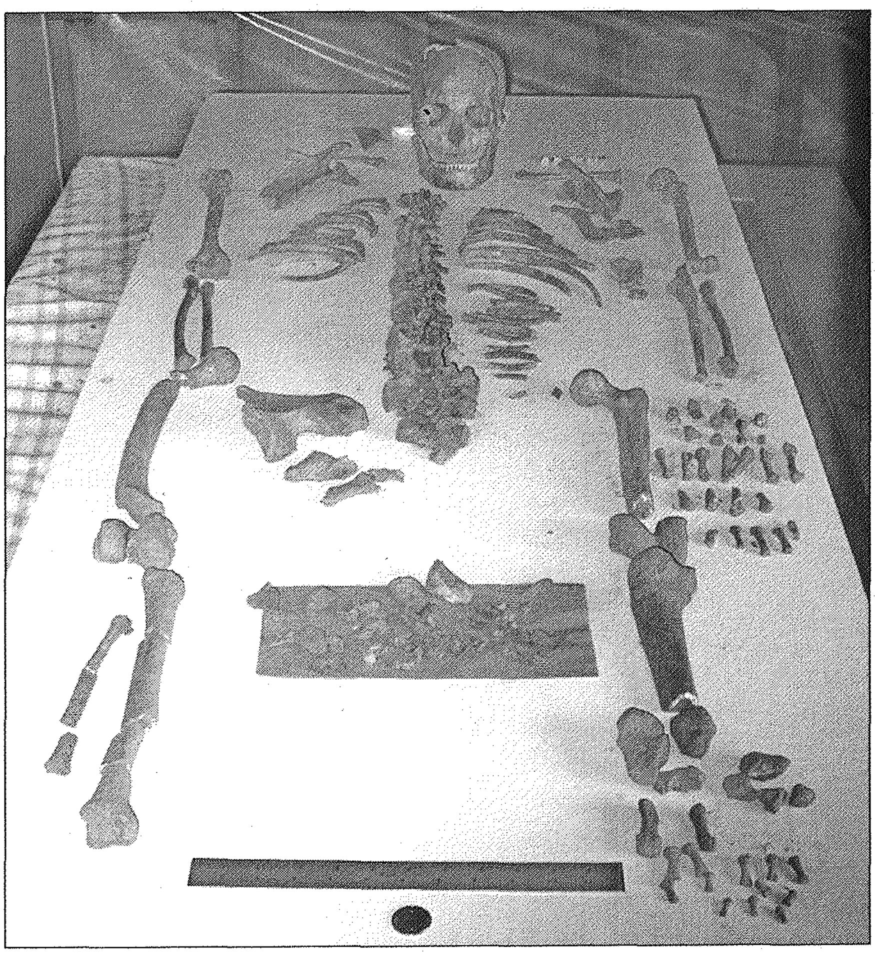

Figure 8.56: Found human remains

The following discussion of the recovered skeletal elements was hampered by lack of time and facilities for detailed analysis as well as a lack of modern reference texts. This may have resulted in minor inconsistencies of element identification. More importantly, discussion of pathologies and ageing require additional analysis, but based entirely upon the digital photographic record.

Skeletal elements not located included:

- Four maxillary teeth.
- The hyoid.
- The 2nd cervical vertebra. C6 (possibly C5) is missing its centrum.
- The 3rd and 4th sternal bodies (the 1st is here referred to as the manubrium).
- Four (?) ribs.
- The proximal and distal epiphyses of the left radius.
- Several carpals, metacarpals and phalanges.
- Portions of the right ischium and pubis, as well as the entire left inominate (ilium, ischium and pubis).
- The 3rd and 4th coccygeal elements.
- The right patella.
- The distal end and lower diaphysis of the left femur.
- The distal epiphysis and lower left tibia, as well as proximal and distal epiphyses of the right tibia.
- The left fibula.
- Several tarsals, metatarsals and phalanges.
- *Skeletal Analysis.* The following summarizes preliminary analyses concerning sex, age, pathologies and dating as well as the hypothesis that remains had been disturbed prior to the excavations reported here, and probably represent a secondary burial situation.
-

Sex Determination.

- Sacrum: relative width of S1 alae to centrum and flat orientation of S1 through S5 indicates the individual was female.
- Inominate: Sciatic notch width indicates a female.

Age Determination (estimates).

- Dentition: eruption of all but the 3rd molars = < 17–18
- Clavicle: < 18–20 (acromial end)
- Scapula: > 14, < 21 (acromion @ 18–19, lower angle @ 20–21)
- Humerus: < 18
- Ulna: left = 20, right < 16 (proximal @ 20, distal @ 16)
- Radius: > 17–18 (proximal @ 20, distal @ 16)
- Carpals: > 12
- Metacarpals: 15–16
- Phalanges: < 18–20
- Manubrium and sternal body: (rarely unite until old age)
- Ribs: 16–20
- Vertebrae: > 16 but < 21 (epiphyseal plates @ 18–23)

- Sacrum: S4 and S5; S1 and S2 fusion: > 18
- Inominate: < 18 (complete fusion @ 23)
- Femur: left > 20; right < 18 (complete fusion by 20)
- Patella: > 15
- Tibia: right < 18, < 20 (proximal @ 18–20, distal @ 16–18)
- Fibula: right < 20 (proximal @ 18–20, distal @ 16–18)
- Tarsals: > 15
- Metatarsals: < 18–20
- Phalanges: < 18
-

Age variables indicate a young woman in her mid to late teens based upon dental eruption and general epiphyseal fusion rates. Of interest are differential fusion rates for the left and right limbs, particularly ulnas and femurs. The left limbs indicate an age of at least 18 to 20, but the right ulna and femur suggest 16 to 18 years of age or less, as do the vertebrae, inominate, sacrum and other bones. She may have been as young as 15, or as old as 20.

Pathologies.

Preliminary forensic analysis indicated differences in limb epiphyseal fusion rates, and mild scoliosis of the 5th lumbar vertebra. The anomalous fusion rates of the right limbs may have been caused by trauma that affected nerves and/or blood supply or an endocrine imbalance, but identification of the causal agent(s) requires more research.

Radiocarbon Assay. This individual lived prior to historical influences in the valley. The first historical record for the Similkameen Valley is that of Alexander Ross, a Hudson's Bay Company employee, who traveled south from the Nicola Valley in AD 1813. The right talus was removed from the skeletal element inventory with permission of the Lower Similkameen Indian Band and was submitted to Beta Analytic Labs for assay.

Lab sample:	Beta 218919
Measured ^{14}C age:	500 ± 40 BP
Conventional ^{14}C age:	**640 ± 40 BP**
Age range at two sigma:	Cal AD 1280 to 1410 (Cal BP 670 to 540)
Mean calibrated age:	ca. CAL AD 1300

Stable radioisotope assays (see below) indicate a diet of 50 ± 10 % from marine sources. In this case, salmon would be the logical dietary co–staple. As such, a marine reservoir correction is required to correct the conventional ^{14}C age estimate. Taylor et al. (2000) suggest a reasonable local marine offset based on diet of at least ± 60 rycrs for the Kennewick remains from central Washington, which are analogous in terms of Columbia River salmon. As such, an "apparent 14C age" is suggested:

"Apparent ^{14}C age": **640 ± 100 BP**

Age range (two sigma): Cal AD 1205 to 1449 (Cal BP 501–745)

Stable Radioisotope assays. Two radioisotope assays were conducted by Beta Analytic Labs, they are: $^{13}C/^{12}C$ ratio: – 16.5 %; $^{15}N/^{14}N$ ratio: + 16.4 %.

These values are consistent with a marine, probably salmon, contribution of at least 50 ± 10 % to the palaeodiet (cf. Chisholm 1986; Chisholm and Nelson1983; Richards and Hedges 1999). As the Similkameen appears to have been salmon–free since the early Holocene, it is likely the young woman spent a large portion of her life living in proximity to areas of the lower Similkameen and Okanagan Rivers or areas of the Columbia Plateau, south of the 49th Parallel. Alternatively, she may have lived in areas of the Similkameen Valley where salmon where procured and transported north, or attained through trade. Yet another alternative is that she may have lived further north, in the Nicola or mid Fraser–Thompson River areas.

Secondary Burial Hypothesis. The differential weathering of facial bones, old breaks on the fibula, tibia, ferrous staining of the mandible and a fragment of a metacarpal, plus several fragments of human bone embedded in one of the two pieces of ferrous metal (Figure 8.57) indicate the 2006 disturbance was not the first post–burial disturbance event. It has been previously noted that the subject area had been under cultivation and road construction prior to subdivision development. Planting and removal of fruit trees as well as disturbance from livestock in the subject area could have resulted in disturbance of the primary inhumation. This is the most plausible explanation for the missing skeletal elements cited above as well as the ferrous staining on bones from opposite ends of the body.

Material Culture. Lithic, bone, teeth and shell artifacts were associated with the scattered skeletal remains. Only six pieces of fire–altered rock were noted during excavations and no pre–contact features were observed, although it should be noted that most of the sediments examined had been disturbed previously.

Lithics. Twenty–five pieces of lithic debitage were recovered. Cursory examination indicated them to be derived from cryptocrystalline silicate and dacite sources. All are secondary to tertiary unretouched flakes with little or no cortex. Complete, proximal, medial and distal sections were noted (Figure 8.57). None exhibited diagnostic attributes sufficient for further analysis. As the human skeletal remains had been severely disturbed, the flakes cannot be directly attributed to the burial assemblage. They, as well as the faunal remains reported below, may well represent a short–term occupation of the area unrelated to the human remains.

A single pebble and several small marble–size pebbles were located. It is possible these functioned as a gaming piece, or they may simply be fortuitous occurrences. A second piece of corroded ferrous metal, without embedded bone, was also recovered.

Faunal remains. four fragments of ungulate long bone diaphyses were recovered as well as two sections of ungulate rib. Three diaphyses were burnt. A single piece of broken bird bone and an unidentified bone, possibly a turtle or fish bone, were also recovered. Given the degree of sediment disturbance, these also cannot be directly associated with the skeletal remains although it is likely there were part of the burial assemblage.

Perforated teeth. Forty perforated sheep (?) incisors were recovered, some in direct association with skeletal elements – others not (Figures 8.57 and 8.58). These, assuming they were originally strung as a necklace, are further evidence of the severe disturbance to the (presumed) burial.

Site Summary

The excavation of approximately 40 m^3 of disturbed archaeological sediments resulted in the recovery of about 85% of the skeletal remains of a single young female of First Nations' ancestry, estimated to have been between 15–20 years of age who died 640 ± 40 years ago (i.e., she was probably alive ca. AD 1300). Stable isotope analyses ($^{13}C/^{12}C$ and $^{15}N/^{14}N$) suggest a diet that was relatively high (over 50%) in marine foods, most likely salmon and/or steelhead. This is likely an indication that she was a seasonal resident in the Similkameen Valley, and was in transit between salmon–rich areas such as the mid Fraser–Thompson, Nicola Valley, and/or the Okanagan and American (U.S.A) Similkameen Valleys or upper Columbia River regions. Planned mitochondrial DNA studies of two maxillary premolars may shed light on her kinship and residence patterns.

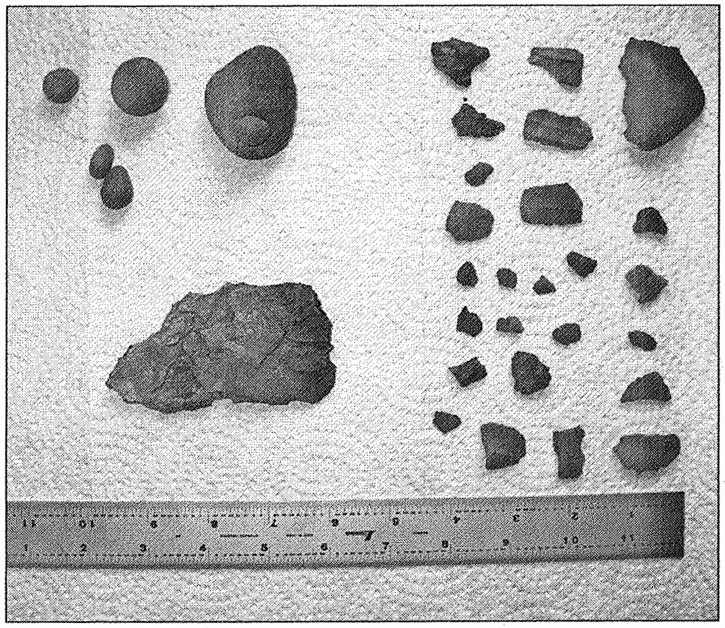

Figure 8.57: Material Culture

Note: possible toy or gaming piece of natural pebbles (upper left), corroded iron (lower left), debitage (right)

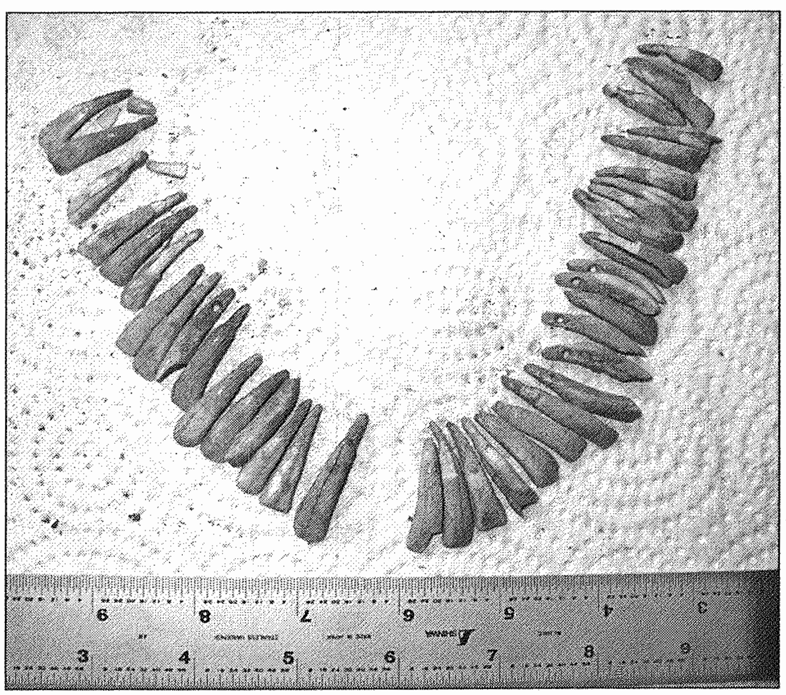

Figure 8.58: Peforated ungulate teeth

– APPENDIX B – –

UPPER SIMILKAMEEN INDIAN BAND

ARCHAEOLOGY DEPARTMENT

HERITAGE RESOURCE POLICY

Note: this document is a copy of the Upper Similkameen Indian Band Heritage Resource Policy on file at the band office in Keremeos, British Columbia.

The Upper Similkameen Indian Band

The watershed of the upper Similkameen River drainage binds the Upper Similkameen Indian Band area of interest from approximately Hedley to its headwaters and the headwaters of its tributaries. Located strategically along the northwest boundary of the Columbia River drainage, the jurisdiction and management area of our people represents the division between the Columbia and Fraser Plateaux.

Within our area of interest, there are many places, known and yet to be discovered, of legend, former villages, camps, trails, hunting and gathering grounds, burial grounds, spiritual training grounds, rock paintings, quarry sites, repository sites, spirited places, transformer sites and ceremonial grounds.

Philosophy & Principles

Upper Similkameen definitions of heritage and heritage sites are not always appreciated or immediately apparent to mainstream Canadians. Upper Similkameen history is anchored in antiquity and is intimately connected with the cultural and physical landscape. Our people believe it is artificial to separate matters of spiritual, social, heritage and economic significance. In this way, the Band's work on its future land claim position is part and parcel of a broader Heritage Resource Policy and all of these issues go towards an understanding of our people's sovereign jurisdiction.

Nevertheless, we also acknowledge that in our dealings with non–native governments, these governments do separate economic uses of the territory from more spiritual and social uses. Further, these governments have enacted laws which are foreign to us, and which compete with our own. Because of these realities, the Band's heritage policy contains our vision of a future based upon the implementation of our legitimate and plenary jurisdiction, as well as requirements to protect our interests in the face of competing laws.

The philosophy of our Heritage Resource Policy is simply based on **Respect** and **Protection** for the **people**, **land**, **resources** and **environment**.

The Upper Similkameen Indian Band declares that this Heritage Resource Policy is to be based upon the following fundamental principles:

The Upper Similkameen Indian Band has an inherent right and obligation to maintain and preserve a distinct cultural identity and way of life for both present and future generations; and

The Upper Similkameen Indian Band must have a meaningful say in all matters relating to the preservation, identification and interpretation of Upper Similkameen Indian Band culture, heritage and spiritual traditions, through full consultations with all levels of government, researchers, developers and other agencies or special interest groups who may be carrying out activities within our area of interest.

It is the mandate of the Upper Similkameen Indian Band to protect and preserve all of our heritage resources. The Archaeology Department will be responsible for notifying the proper authorities when non–referral related developments are thought to be impacting potential heritage resources such as those that occur on private lands. If no resolution is reached then the matter will be referred to the Chief and Council of the Upper Similkameen Indian Band.

General Policies
The Upper Similkameen Indian Band asserts proprietary rights and governmental jurisdiction over our area of interest. More specifically, we will exercise jurisdiction and stewardship over our heritage resources located within our jurisdiction.
Broadly speaking, the Band's heritage resources include but are not limited to the following:
Plant & Animal Resource Use Areas
Hunting places/areas
Plant procurement places/areas
Berry picking places/areas
Food preparation places
Fishing places/areas

Sacred and Spiritual Places
Places of mythological significance
Social landscape features
Burial sites
Rock cairns and alignments
Fasting/vision quest sites

Areas of Historical Significance (that do no always fall under the classification of Archaeology Site)
Place name locations
Known battle areas
Traplines
Trails and trail markers
Culturally modified trees (CMT's) and features
Village and camp sites
Traps and weirs
Hunting drives and fences
Ochre procurement places

Archaeology Sites
Pictograph sites
Cache pits and house pits/house locations
Roasting pits and related features
Stone quarry sites
Lithic scatters and remains
Hearth features
Buried archaeological sites

Heritage resources also include various cultural materials and documentary evidence that may reside in libraries, files, museum collections, and other repositories, which are situated on or off

Upper Similkameen Indian Band reserves or jurisdiction and management area. They include (but are not limited to):
Curated archaeological collections and provenance documentation (in museums);
Private archaeological collections; Ethnographic, Linguistic and Ethnobotanical collections and documentations;Soil samples, radiocarbon samples, faunal remains and other archaeological materials;
Oral history tapes (audio and visual), notes and related material.
In the long term, once the Band has established a museum facility it shall take steps to repatriate selected items, as well as complete collections of archival, ethnographic and archaeological collections and materials that may be stored and curated elsewhere. This will be accomplished through a policy of repatriation to be activated once the Band has developed the appropriate storage facilities.

Application of Heritage Resource Policy
The Upper Similkameen Indian Bands Heritage Resource Policy shall apply to the area of interest outlined in Appendix 1. Insofar as this policy may conflict with provincial or federal laws or policies, the Band, asserting the priority of its policy, shall take all possible steps to have other government agencies to acknowledge and comply with the Bands Heritage Resource Policy.
The policy shall govern and apply to all land developments; minerals and forestry resources; exploitation projects, including rivers and waterways; and any other projects or works that may impact on the heritage of the Upper Similkameen Indian Band. The policy shall apply to any and all research that may be proposed by anthropologists, archaeologists, ethnographers, historians or any other disciplinary research where the Upper Similkameen Indian Band cultural and historic traditions and/or locations are the subject of study. Without restricting academic inquiry, and in the interest of respect and authenticity, all such investigations should be carried out under an Upper Similkameen Indian Band Heritage Investigation Permit and/or Research Permit attached as Appendix 2 and 3 to this policy.
The Upper Similkameen Indian Band will encourage bona–fide research within our area of interest as long as this can be shown to be beneficial to the Band as a whole or to individual members of the Band. The Band will also encourage and facilitate the training of Band members in various aspects of historical research, archaeology, history, and heritage resource management, through educational programs and other means.
The Upper Similkameen Indian Band has established and will continue to operate an Archaeology Department for the purposes of identifying, protecting and interpreting the heritage resources of the Band. The Archaeology Department will regulate and manage all heritage resources and related resource management and research projects within our area of interest. The Archaeology Department also acts as a liaison process between the Band membership, the Band council and all outside agencies in all matters pertaining to the protection, management and conservation of heritage resources.
The interest of the Upper Similkameen Indian Band should be paramount over all other interests. The Band will have sole authority over those dealings which impact most on the Band and over all the lands within the Band's jurisdiction. Dialogue will proceed from that stance to other stakeholders, First Nations and all other outside agencies.
Management shall be the Chief and Council of the Upper Similkameen Indian Band; a networking of interdepartmental advocates, centralized with experts from within the organisation, and an advisory board of elders, consultants and advisors as appointed by Chief and Council.

Heritage Resource Management Process

The Band will take all necessary steps to work with the Province of British Columbia in order to enforce its Heritage Resource Policy in areas outside of the reserves set aside for the Band. The Band will do so without prejudice to its asserted rights and jurisdiction over all the lands and resources within our area of interest.

In areas within the Band's reserves, the policy contained in this document shall apply absolutely.

Development Referrals

Normally, a development driven referral will undertake a several stage process that may or may not lead to a recommendation for further archaeological research. The first step is to determine what, if anything is known about the proposed development area. This includes checking the list of recorded archaeological sites in the area, checking to see if there has been any previous studies done in the area and the results of those studies (these studies should not be limited to archaeology studies alone; if information exists on fish and wildlife or environmental studies that have been undertaken the information could be useful and these should be reviewed as well). If the referral proves to have moderate to high potential for the activity to result in the loss or disturbance to heritage resources then the development driven referral becomes a heritage resource management project.

The following process for cultural resource management is specifically aimed at the identification and management of heritage resources and features that may be located within or impacted by proposed (or ongoing) land development activities within the jurisdiction and management area of the Upper Similkameen Indian Band. These resources/features will normally include archaeological sites and plant and animal resource use areas that must either be preserved or subjected to proper scientific field studies and recovery programs, prior to any ground altering activity that may be planned within the Band's jurisdiction and management area.

There are several different types of heritage resource management projects that could be undertaken depending upon the nature and size of the proposed development.

Archaeology Overview Assessments

An Archaeological Overview Assessment (AOA) is undertaken to assess the archaeological potential of a study area. This process includes:

A literature search, summary and analysis;

An analysis of the distribution of known and recorded sites;

A review of ethnographic information and interviews with elders and other knowledgeable community members regarding the study area;

Based on the information above, and evaluation of the archaeological resource potential and distribution of the study area;

Preparation of detailed maps at an appropriate scale;

Detailed description and rational for the methodology employed including justification of each variable, typology, or weighting employed;

The extent of potential impacts to any archaeological resources resulting from the proposed development activities is assessed;

Recommendations and justification on the necessity, or not, for further archaeological investigations.

AOA's are sometimes done on a regional level. They generally use geographic information systems (GIS) to develop predictive models to generate archaeological potential maps designating areas of high, low and moderate potential for the location of archaeological resources. An AOA is not intended to be a final, static product but an evolving predictive archaeological model, which can be regularly tested through field reconnaissance. It is improved as new information becomes available through research, archaeological impact assessment findings and inventory data.

If an AOA concludes that moderate to high potential archaeological value exists in an area, either a Preliminary Archaeological Reconnaissance (PAR) or Archaeological Impact Assessment (AIA) is undertaken to confirm or deny the AOA conclusions.

Preliminary Archaeological Reconnaissance and Archaeology Impact Assessment

A PAR and AIA are both types of archaeological surveys. A PAR is a systematic traverse of an area to ground–truth or visually find and inspect sites. An AIA is more detailed and formalized and a PAR. Under this Heritage Resource Policy and provincial law permits will be required. Those allow for the following:

Sub–surface testing;

The collection of samples and artifacts.

An AIA requires the recording of sites and findings to specific standards within the Band and provincial systems.

PAR's and AIA's require the following:

Experienced personnel with familiarity with the present day Upper Similkameen people and their history;

Experienced personnel with the professional judgement to know where to place transects and shovel tests (for AIA's) and possessing basic familiarity with archaeological site types and artifacts in common in the local area;

Use of foot transects using a compass and hip chain by a minimum crew of three at intervals of between 15 and 30 meters, depending on terrain;

Use of a note–taking system using standarized forms and including sketch maps to record observations (attached as Appendix 3); and

For an AIA, at least two shovel tests judgementally placed within each 100 meters distance covered.

There are often situations where PAR's and AIA's are conducted in the absence of a prior AOA. When a study are is small, it is more cost effective to simply go out and do a survey rather than conduct extensive research on the probability of locating sites. As much research must be done as practical when conducting a PAR or AIA in the absence of an AOS as less obvious site types could be overlooked without proper background information.

An Archaeology Inventory Study (AIS) is similar to other types of heritage resource management projects but it is not driven by a development related referral. Rather, an AIS, is a research project designed to look at a larger area (e.g. a unique landscape or watershed) independent of development that may or may not be taking place in the area.

An AIS project can be an AOA with the added component of ground–truthing a statistically valid sample and recording the presence of visible archaeology sites and testing the model developed during the AOA process. An AIS project can also contain a shovel–testing program to search for buried archaeological resources that would not otherwise be located. These forms of AIS are far more costly with a smaller sample size than and AIS without shovel testing however, in small sampling areas where the probability of buried resources is very high then this type of program is preferred.

The basic components of AIS include the following:

Archival, library and oral history research (interviews with elders, etc.)

A comprehensive field survey resulting in the identification of as many historically significant areas as possible (including archaeology, spiritual and traditional use sites)

Another form of AIS is the Aboriginal Interest Study. These studies are not recognized by the archaeology branch but are widely undertaken by First Nation groups and funded by development proponents as well as other agencies such as Forest Renewal BC. Aboriginal Interest Studies address issues such Aboriginal right and title, wildlife, environmental and other Aboriginal issues as the First Nation group is able to address allowing for a more complete picture of the landscape in question.

Impact Mitigation

In the case where a development will be proceeding to the detriment of a heritage resource the following guidelines will apply:

For archaeological sites which are deemed by the Band to be significant, an excavation program must be carried out to recover an adequate sample of data represented

For resource gathering areas which are deemed by the Band to be significant, a detailed documentation of the areas resources, means of utilization, history, relationship to individual families or person's and any other pertinent documentary evidence of past and current use, will be carried out.

Sacred and spiritual sites, as well as historically significant areas, are deemed by the Band to be unalterable.

Data Synthesis and Repository (Museological Institution)

The final stage of all heritage resource management projects will include:

Complete analysis and documentation of all material collections and data;

Scientific collections, which shall include: artifacts manufacturing detritus, faunal remains, on (and off) site soil matrix samples, geotomes (preserved stratigraphic sections), plant materials, burial remains and; paper, film, video, publications, teaching kits, recordings, and computer records, all of which give meaning to the rest of the collection, shall be deemed the property of the Upper Similkameen Indian Band;

Production of final reports which will present the project findings to the Chief and Council of the Upper Similkameen Indian Band, Band representatives, and to the Band membership;

When it is developed, the Upper Similkameen Indian Band museum and research facility will be named as the repository for any cultural property, material and artifacts; as space, technology, and certification allows (this being determined by the Management of the Upper Similkameen Indian Band). Until this time, agreements must be made with the repository chosen that consent to return all of the items to the Upper Similkameen Indian Band upon development of a Band facility to house them.

Protocols and Agreements

It will be the responsibility of the project proponent – in cases of development driven heritage resource management projects – to provide the necessary funding and other resources necessary for such projects to be carried out. Development proponents will be required to enter into contractual agreements with the Upper Similkameen Indian Band and all such agreements will outline specific protocols relating to the relationships between the Band and the proponent, with regard to project schedules, methodologies, coordination of work and project costs.

Normally, projects will be administered and coordinated by the Upper Similkameen Indian Band; management will include assessment, prioritization, profiles of land usage policies, standards, guidelines and stewardship, this being synchronized with the Upper Similkameen Indian Band departments being impacted on.

Outside consulting firms shall be required to hire workers from within the job force on the reserve. For example, graduates from accredited programs, those with field experience, and those in high school with an interest in the field of archaeology. All aspects of the project should have Band input including interpretation, examination and testing.

Ownership of all materials shall be deemed to be the property of the Upper

Similkameen Indian Band including the sites, features found within the sites, and the archaeological collections. Objects, which have been lost or intentionally put away, (burials) cannot belong to their finders. Objects found by someone not working under a permit should be regarded as property, which cannot be "owned" by an individual. Finally, it is improper to assign monetary value" to any find or collection.

Burial Remains
The members of the Upper Similkameen Indian Band recognize and respect the profound spiritual and religious significance of human burial remains, graves, grave goods, offerings, and the ground surrounding such remains. It shall be the policy of the Upper Similkameen Indian Band that all such remains and associations shall remain undisturbed and sacred.
Only in exceptional circumstances will the disturbance or exhumation of human remains be permitted. This can only occur after full consultation with Band elders, or someone appointed by Chief and Council, who must give their permission for a disturbance to take place. Any such disturbance or exhumation must be preceded and followed by appropriate ceremonies, as determined by Band elders and spiritual advisors. In areas where human remains are accidentally discovered or disturbed, all development or ground disturbance activity must immediately cease and the Band informed. The future dispositon of accidentally found human remains, disposition will be determined by the Upper Similkameen Indian Band.

Protected Areas
At times the Band may identify areas to be set aside as Protected Areas. Protected areas may include land and freshwater or marine areas that are set aside to protect the integrity and heritage of the area. These tracts are inalienable, the land and resources may not be sold. No industrial extraction or development will be permitted in these areas.
The Upper Similkameen Indian Band will actively seek, through negotiations and consultation with all levels of government, researchers, individual land owners, various government agencies, and special interest groups, a policy to set aside land for short and long term protection.
These areas will include any outstanding or unique botanical, zoological, geological, and fragile heritage features. Priority will be set according to the significance of each of these criteria and to their time period association, authenticity, physical integrity, antiquity and spirit of the place.

UPPER SIMILKAMEEN INDIAN BAND ARCHAEOLOGY DEPARTMENT
RESEARCH PERMIT

(to be completed when conducting research within USIB archives
or when conducting oral interviews with our membership)

USIB Permit No.:	**Date:**
Researcher's Name:	
Institutional/Company Affiliation:	
Title of Research Project:	
Research Period (DD/MM/YY to DD/MM/YY):	
Discipline/Field of Research Interest:	
Description of Project or Research:	
(continue on a separate sheet if necessary)	
The Upper Similkameen Indian Band provides official endorsement of this project, and its officers believe that this research is meaningful to the Upper Similkameen people. The researcher agrees to complete an Upper Similkameen Indian Band Oral Interview Consent and Release Form and provide the Upper Similkameen Indian Band with copies of all data collected and reports/papers produced.	
Signature of Upper Similkameen **Indian Band Representative:**	
Signature of Researcher:	

See other side for additional terms and conditions of Permit

Permit Terms and Conditions:

1. This permit is valid for a period of one year from the date of issuance indicated on the front page of the Permit Form.
2. The permit holder will make a concerted effort to hire at least one Upper Similkameen individual (with an appropriate level of experience and training) to assist in conducting this project if it is a funded project.
3. The permit holder is responsible for ensuring that all staff working on this project is familiar with the Upper Similkameen Indian Band Heritage Policy (a copy of this document will be provided upon request).
4. The permit holder will abide by the terms and conditions of the Upper Similkameen Heritage Policy.
5. The permit holder shall provide the Upper Similkameen Indian Band with at least one copy of the final report or relevant section of the final report for this project, *prior* to the expiration of this permit. All final reports are expected to meet or exceed the reporting standards developed by the Provincial Archaeology Branch. In the event that provincial reporting standards and/or guidelines are not applicable to this project, the permit holder is responsible for developing such stands/guidelines and/or terms of reference in consultation with the Upper Similkameen Indian Band.
6. The permit holder shall provide the Upper Similkameen Indian Band one copy of any updated or newly recorded British Columbia Archaeological Site Inventory Form(s) resultant from the project.
7. The Band and the permit holder shall jointly use their best efforts to publish any results from the investigation. In the case of publication there shall be joint copyright between the permittee and the Band over any such publication, unless otherwise agreed between the parties.
8. Any application for extension of the permit must be made at least 30 days prior to the permit expiration date.
9. Reasonable amendments and/or additions to this permit may be requested in writing on an "as needed" basis.
10. A representative of the Upper Similkameen Indian Band may at any time inspect any project being conducted under this permit.
11. Copies of all data, maps, journals and photographs and other material generated through or found as a result of the study are to be submitted to the Upper Similkameen Indian Band no later than 60 days following the conclusion of this permit, unless otherwise agreed to by the Band.
12. The Band reserves the right to terminate this permit if the permit is breached or if Chief and Council of the Band form the opinion that a continuation of the study is contrary to the interests of the Band.

Other Terms and Conditions:

UPPER SIMILKAMEEN INDIAN BAND
HERITAGE INVESTIGATION PERMIT

<table>
<tr><td colspan="8">A copy of the Primary Investigator's CV is attached or on file:</td></tr>
<tr><td colspan="8">Application Processing Fee ($50) attached:</td></tr>
<tr><td colspan="5">USIB permit No.:</td><td colspan="3">Date:</td></tr>
<tr><td colspan="4">Primary Investigator:</td><td colspan="4">Company Name:</td></tr>
<tr><td colspan="8">Short Name of Project:</td></tr>
<tr><td colspan="8">Location of Project:</td></tr>
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<tr><td colspan="5"></td><td colspan="3">Map Attached:</td></tr>
<tr><td colspan="2">Nature of Investigations</td><td colspan="2">Development Related:</td><td></td><td colspan="2">Education Related:</td><td></td></tr>
<tr><td colspan="2">Development Property:</td><td colspan="2">Transportation:</td><td colspan="2">Forestry:</td><td colspan="2">Recreation:</td></tr>
<tr><td>Mining:</td><td colspan="7">Other:</td></tr>
<tr><td colspan="2">Type of Research</td><td colspan="2">Overview</td><td></td><td colspan="2">Survey</td><td></td></tr>
<tr><td colspan="3">Archaeological Testing</td><td></td><td colspan="3">Archaeological Excavation</td><td></td></tr>
<tr><td colspan="8">Do you expect to interview our Elders in the course of this research?</td></tr>
<tr><td colspan="2" rowspan="2">Time Framework (estimate):</td><td colspan="3"></td><td colspan="3"></td></tr>
<tr><td colspan="3">(begin: day/month/year)</td><td colspan="3">(end: day/month/year)</td></tr>
<tr><td colspan="8">Other Project Permits Pertaining to this Investigation (please attach copies with this application)</td></tr>
<tr><td colspan="8">Municipal:</td></tr>
<tr><td colspan="8">Provincial:</td></tr>
<tr><td colspan="8">Federal:</td></tr>
<tr><td colspan="8">Project Description (in simple English within the space provided):</td></tr>
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<tr><td colspan="8"></td></tr>
<tr><td colspan="8">Permit Conditions: As chief investigator for this project, I hereby agree to abide by policies outlined in the Upper Similkameen Heritage Policy as well as the conditions outlined on the reverse of this document.</td></tr>
<tr><td colspan="6">Primary Investigator's Name:</td><td colspan="2">Date:</td></tr>
<tr><td colspan="8">Primary Investigator's Signature:</td></tr>
<tr><td colspan="6">Name of Band Representative:</td><td colspan="2">Date:</td></tr>
<tr><td colspan="8">Signature of Band Representative:</td></tr>
</table>

See other side for additional terms and conditions of Permit

Permit Terms and Conditions:

1. This permit is valid for a period of one year from the date of issuance indicated on the front page of the Permit Form.
2. The permit holder will make a concerted effort to hire at least one Upper Similkameen individual (with an appropriate level of experience and training) to assist in conducting this project.
3. The permit holder is responsible for ensuring that all staff working on this project are familiar with the Upper Similkameen Indian Band Heritage Policy (a copy of this document will be provided upon request).
4. The permit holder will abide by the terms and conditions of the Upper Similkameen Heritage Policy.
5. In the event that human remains are identified at any time during the course of this project, the permit holder must immediately cease and stabilize any disturbance of the remains, inform the Upper Similkameen Indian Band of the nature and location of the remains, and implement any instructions provided by these individuals regarding the treatment of the remains.
6. The permit holder will provide the Upper Similkameen Indian Band an opportunity to review and comment on the proposed management recommendations relating to any heritage sites identified during the course of this project, *prior* to the production of the final report.
7. Implementation and inclusion of editorial comments made by the Upper Similkameen Indian Band with regard to management recommendations and/or any other portion of the project report will be negotiated between the permit holder and the Upper Similkameen Indian Band *prior* to report finalization.
8. The permit holder shall provide the Upper Similkameen Indian Band with at least one copy of the final report for this project, *prior* to the expiration of this permit. All final reports are expected to meet or exceed the reporting standards developed by the Provincial Archaeology Branch. In the event that provincial reporting standards and/or guidelines are not applicable to this project, the permit holder is responsible for developing such stands/guidelines in consultation with the Upper Similkameen Indian Band.
9. The permit holder shall provide the Upper Similkameen Indian Band one copy of any updated or newly recorded British Columbia Archaeological Site Inventory Form(s) resultant from the project.
10. The Band and the permit holder shall jointly use their best efforts to publish any results from the investigation. In the case of publication there shall be joint copyright between the permittee and the Band over any such publication, unless otherwise agreed between the parties.
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13. A representative of the Upper Similkameen Indian Band may at any time inspect any project being conducted under this permit.
14. Copies of all data, maps, journals and photographs and other material generated through or found as a result of the study are the exclusive property of the Upper Similkameen Indian Band and are to be submitted to Band no later than 60 days following the conclusion of this permit, unless otherwise agreed to by the Band.
15. The Band reserves the right to terminate this permit if the permit is breached or if Chief and Council of the Band form the opinion that a continuation of the study is contrary to the interests of the Band.

Other Terms and Conditions:

– APPENDIX C –

LARGE FORMAT TABLES

The following tables from the thesis text, barring other appendices, are listed here for clarity of presentation as they extend beyond a standard page length.

Table 2.5: **Selected Fauna–Dry Interior Zone(BG,PP,IDF), Montane Spruce (MS), Engelmann Spruce–Subalpine Fir (ESSF) and Alpine Tundra (AT) Zones** (after Stevens 1995: 123–190)

Key: Abundance:

Upper case letter = common, very common, abundant

Lower case letter = rare, scarce, uncommon, scattered and sporadic

- Y,y yearlong
- P,p spring (March–May)
- S,s summer (June–August)
- A,a autumn (September–November)
- W,w winter (December–February)
- M,m migratory (spring and autumn)
- * denotes ethnographic use

Note: Multiple letter sequences (i.e. PsAW,Y) refer to microzonal variation in terms of increasing precipitation and elevation ranges within each zone.

Mammals:	**BG**	**PP**	**IDF**	**MS**	**ESSF**	**AT**
Snowshoe hare (*Lepus americanus*) *	y	Yy	Yy	Yy	Yy	
Yellow bellied marmot (*Marmota flaviventris*) *		Y	Y			
Hoary marmot (*Marmota caligata*) *					Y	Y
Columbian ground squirrel (*Spermophilus columbianus*) *	Y	Y	Y	Y	Y	Y
American red squirrel (*Tamiasciurus hudsonicus*) *	yY	Y	Y	Y	Y	
Northern flying squirrel (*Glaucomys sabrinus*) *			Y	Y	Y	
American beaver (*Castor canadensis*) *	Y	Y	Y	Y	Y	
Muskrat (*Ondatra zibethicus*) *	Y	Y	Y	Y	Y	
Porcupine (*Erethizon dorsatum*)		Y	Y	Y	Y	
Coyote (*Canis latrans*)	Y	Y	Y	Y	Y	Y
Wolf (*Canis lupus*)	y	Y	Y	Y	yS	Y
Red fox (*Vulpes fulva*)	Y	Y	Y	Y	Y	Y
Black bear (*Ursus americanus*) *	y	y	Y	Y	Y	S
Grizzly bear (*Ursus arctos horribilis*)			p1,psa,y	y	SAW	psa
Fisher (*Martes pennanti*)			Y	Y	Y	
Ermine (*Mustela erminea*)	Y	Y	Y	Y	Y	
Mink (*Mustela vision*)	Y	Y	Y	Y	Y	
Wolverine (*Gulo luscus*)			yY	Y	y	S
River otter (*Lontra canadensis*)	Y	Y	Y	Y	Yy	
Skunk (*Mehpitis mephitis*)	Y	Y	Y	Y		
Cougar (*Felis concolor*)	y	y	Y	Y	YS	
Lynx (*Lynx canadensis*)		y	Y	Y	Y	
Bobcat (*Lynx rufus*)	Y	Y	Y	Y	Y	
Mule deer (*Odocoileus hemionus*) *	PsAW,Y	PsaW,Y	PSAw,Y	PSAw	SA	SA
White–tailed deer (*Odocoileus virginianus*) *	Y	Y	Y	psa, PSA	psa,PSA, sa	sa
Elk (Wapiti) (*Cervus elaphus nelsoni*) *		Y	Y	s	s,PSAw, SA,pSAw	SA

Mammals:	BG	PP	IDF	MS	ESSF	AT
Moose (*Alces alces*) [20th Century appearance only]			PsAW, Y,w	Y	pSAw,S	s
Mountain goat (*Oreamnos americanus*) *		w,y	w,S	SY	YS	pSaW
Bighorn sheep (*Ovis canadensis*) *		Y,pw	PsaW,s	sy	Ys	Y
Pronghorn antelope (*Antilocapra americana*) * [USA]	saw	saw				

Table 2.6: Traditional Usage: Avifauna

Waterfowl:	BG	PP	IDF	MS	ESSF	AT
Canadian goose (*Branta canadensis*) *	Y	Y	Y,SwM	SWm,sm	s	S
Snow goose (*Chon caecrulescens*) *	wm	wm	wm			
Trumpeter swan (*Olor buccinator*)	wm	wm	m			
Northern pintail (*Anas acuta*) *	swM	swM,sM	swM,Psa			
Mallard (*Anas platyrhyncos*) *	Y	Y	Y,SwM	sm	ps	
Blue–winged teal (*Anas discors*) *	PsaW	psw,Psa	Psa,ps	s	ps	Ps
Green–winged teal (*Anas carolinensis*) *	swM	swM	SwM,y	sm		
Redhead (*Aytha americana*) *	SwM,SmW	SswM, [illegible]	PSA,sm,m			
Common loon	y	y	Y	Sm	sm	Sm
Red–necked grebe	SwM	SwM	SwM	m	sm	
Wood duck	sm	y,sm	y,ps			
Cinnamon teal	sm	sm	Psa,sm	s	s	Ps
Canvasback	sm	swM,sm	sm	m,s		
Lesser scaup	SwM, sm	SwM, sm	SwM,sm	sm,ps	sm	Sm
Greater scaup	sWM, wM	SwM, m	S,. w,	m		
Harleguin duck	sm, ps	y,sm	ps	ps	ps	Ps
Common goldeneye	SwM	SwM	SwM,y	sm	ps	Ps
Bufflehead	Swm	SwM	SwM,sm	SwM	ps	S
Riddy duck	SwM	sm, SwM	sm	m		
Widgeon (*Mareca americana*) *	sWM	sWM	sWM,SwM,sM,m		p	
American coot (*Fulica americana*)	SM	y,SwM	SwM,m			
Mourning dove *	Psaw,ps	SwM, sm	SwM,ps	w		
White–tail ptarmigan					y	y
Rock ptarmigan						y
Willow ptarmigan						Y
Raptors:						
Hooded merganser (*Lonhodytus cucullatus*)	swM	swM,y	swM,sm,m	sm,s	ps	ps
Bald–headed eagle (*Haliaeetus leucocephalus*)	swM	swM	swM	ps	ps	
Golden eagle (*Aquila chrysaetos*)	y	y	y	y	sm	ps
Northern harrier (*Circus cyaneus*)	swM	swM,sM	swM,sM	m	m	

	BG	PP	IDF	MS	ESSF	AT
Rough–legged hawk (*Buteo lagopus*)	wm	wm	wm	sm	m	m
Red–tailed hawk (*Buteo jamaicensis*)	PSAw	y, SM	PSAw,psa	sm	sm	sm
Coopers hawk (*Accipiter cooperii*)	sm	y,sm	sm	sm	sm	sm
Osprey (*Pandion haliaetus*)	Psa	Psaw,Psa	Psa,ps	ps		
Great horned owl (*Bubo virginianus*)	y	y	y	y	y	
Blue grouse (*Dendragapus obscurus*) *	y	y	y	y	y	y
Ruffed grouse (*Bonasa umbellus*) *	Y	Y	Yy	y		
Spruce grouse (*Dendragapus canadensis*) *	y	y	y	y	y	
White–tailed ptarmigan (*Lagopus leucurus*) *					y	y
Common nighthawk (*Chordeiles minor*)	pSA	pSA	pSA,ps	s		
Other Species:						
Sandhill crane (*Grus canadensis*)	sM	sM,m	sM			
Great blue heron (*Ardea herodias*)	Y	Y	Y	s		

Table 2.8: Similkameen Floral Resources (after Parish et.al. 1996 and Turner 1998)

Common name	Latin Binomial	Traditional Use
		(* denotes important species)
Black Tree Lichen	*Bryoria fremontii*	pressed into dried loaves and stored
Chanterelle Mushroom	*Cantharaellus cibarius*	fresh, fried or boiled
Shaggy Mane Mushroom	*Cprinus comatus*	fresh
Oyster Mushroom	*Pleurotus ostreatus*	fresh, dried
Pine Mushroom	*Tricholoma magnivelare*	fresh, dried
Cottonwood Mushroom	*Tricholoma populinum*	fresh, dried
Bracken Fern	*Pteridium aquilinum*	fresh, dried (flour)
Rocky Mountain Juniper	*Juniperus scopulorum*	medicinal boughs and berries
Western Larch	*Larix occidentalis*	cambium, sap (medicine) *
Alpine Larch	*Larix lyallii*	twig survival soup
Whitebark Pine	*Pinus albicaulis*	seeds, cambium
Lodgepole Pine	*Pinus contorta*	cambium
Ponderosa Pine	*Pinus ponderosa*	cambium, seeds
White Pine	*Pinus monticola*	cambium, seeds, sap (medicine) *
Subalpine Fir	*Abies lasiocarpa*	cambium, bark, sap (medicine) *
Trembling Aspen	*Populus tremuloides*	cambium
Black Cottonwood	*Populus balsamifera*	cambium (medicine) *
Paper Birch	*Betula papyrifera*	cambium, sap (medicine) *
Western Red Cedar	*Thuja plicata*	medicine *
Interior Douglas Fir	*Pseudotsuga menziesii*	seeds, medicine, "sugar" *
Engelmann Spruce	*Piscea engelmannii*	medicine *
White Spruce	*Picea glauca*	medicine *
Black Spruce	*Picea mariana*	sap (medicine) *

Common name	**Latin Binomial**	**Traditional Use**
Nodding Onion	*Allium cernuum*	fresh, dried bulbs *
Fool's Onion	*Brodiaea doublasii*	fresh, dried corms *
Mariposa Lily	*Calochortus macrocarpus*	fresh, dried bulbs*
Blue Camas	*Camassia quamash*	fresh, dried bulbs (rare)
Yellow Avalanche Lily	*Erythronium grandiflorum*	fresh, dried bulbs *
Chocolate Lily	*Fritillaria lanceolata*	fresh stems and bulbs
Yellowbell	*Fritillaria pudica*	fresh, dried bulbs *
Tiger Lily	*Lilium columbianum*	fresh, dried bulbs *
False Solomon's Seal	*Smilacina racemosa*	fresh berrries
Star–flowered Solomon's Seal	*Smilacina stellata*	fresh berries
Cat–tail	*Typha latifolia*	rhizomes, stems, flowers
Cow Parsnip	*Heracleum lanatum*	fresh, dried stalks and leaf stems
Biscuitroot	*Lomatium spp.*	dried roots by trade only (exotic)
Chocolate Tips	*Lomatium dissectum*	fresh shoots only (roots poisonous)
Desert Parsley	*Lomatium macrocarpum*	fresh roots
"Indian Celery"	*Lomatium nudicaule*	fresh sprouts, leaf–stalks, leaves, seeds
Wild Caraway	*Perideridia gairdneri*	fresh, dried roots *
Water Parsnip	*Sium suave*	fresh shoots and roots (flower poisonous?)
Balsamroot	*Balsamorhiza sagittata*	shoots, roots, seeds *
Thistles	*Cirsium spp.*	fresh roots (medicinal) *
Hawkweeds and Dandelions	*Heiracium spp and Agoseris spp.*	latex (medicinal) *
Oregon Grape	*Mahonia aquifolium*	fresh, dried berries *
Halenut	*Corylus cornuta*	fresh, dried nuts *
Brittle Prickly–pear	*Opuntia fragilis*	fresh stems and fruit
Blue Elderberry	*Sambucus cerulea*	fresh, dried berries *
Red Elderberry	*Sambucus racemosa*	fresh, dried berries *
Red Osier Dogwood	*Cornus sericea*	fresh, dried berries *
Soapberry	*Shepherdia canadensis*	fresh, dried berries (medicinal) *
Kinnikinnick ("Indian tobacco")	*Arctostaphylos uva–ursi*	fresh, dried berries and leaves (medicinal)
Labrador Tea	*Ledum groenlandicum*	fresh, dried leaves (medicinal) *
Dwarf Blueberry	*Vaccinium caespitosum*	fresh, dried berries *
Mountain Bilberry	*Vaccinium membranaceum*	fresh, dried berries *
Grouseberry	*Vaccinium scoparium*	fresh, dried berries *
Waxy Currant	*Ribes cereum*	fresh berries (medicinal) *
Northern Black Currant	*Ribes hudsonianum*	fresh berries
Wild Gooseberries	*Ribes spp.*	fresh berries
Ball–head Waterleaf	*Hydrophyllum capitatum*	fresh roots
Bugleweed	*Lycopus uniflorus*	fresh tubers
Fireweed	*Epilobium angustifolium*	fresh stem
Spring Beauty	*Claytonia lanceolata*	fresh, dried corms *
Bitter–root	*Lewisia rediviva*	fresh, dried roots *
Saskatoon Berry	*Amelanchier alnifolia*	fresh, dried berries *
Red Hawthorn	*Crataegus columbiana*	fresh, dried berries *
Wild Strawberries	*Fragaria spp.*	fresh berries
Common Silverweed	*Potentilla anserina*	fresh roots
Choke Cherry	*Prunus virginianus*	fresh, dried berries *
Wild Roses	*Rosa spp.*	fresh, dried fruit (medicinal) *
Low or Dwarf Raspberries	*Rubus spp.*	fresh fruit

Wild Raspberry	*Rubus idaeus*	fresh fruit
Blackcap	*Rubus leucodermis*	fresh fruit
Thimbleberry	*Rubus parviflorus*	fresh fruit

Table 4.1: Previous Archaeology – Similkameen and TulameenValleys

Thesis fieldwork: *AIA* *Archaeological Impact Assessment (permit)*
AIS *Archaeological Inspection Survey (permit)*
PFR *Preliminary Field Reconnaissance (non–permit)*

Reference	**Project Type**	**Comments**
Goodfellow (1928)	Pioneer	Early report on pictograph sites in the Similkameen Valley
Teit (1930)	Pioneer	Early site recording and documentation
Harris (1949)	Article	Two page, non–technical overview of South–central B.C. pictograph sites including the Similkameen Valley
Caldwell (1954)	Reconnaissance	Mid–20th Century site reconnaissance of Okanagan–Similkameen
Corner (1968)	Reconnaissance, Publication	Pictographs (Indian Rock Paintings), publication
Copp (1975)	*Reconnaissance*	*Limited reconnaissance of Okanagan–Similkameen Valleys*
Hanson and Taylor (1975)	Reconnaissance	Evaluation of pictograph sites between Hedley and Keremeos; Upper Similkameen
Kennedy (1977)	AIA	Initial work regarding rock art site conservation in British Columbia
Carfantan (1977)	Reconnaissance	Regional site inventory of Thompson–Okanagan–Similkameen
Beauchamp (1978)	Evaluation	Project Standing Rock (DhQx–8), pictograph site evaluation; Upper Similkameen
Bussey (1987)	AIA	Proposed gravel pit, Old Hedley Road, Upper Similkameen.
Salo (1987)	Reconnaissance, AIS, AIA	Survey and testing of sites in Palmer Lake vicinity of Washington State
Fladmark , Rousseau and Breffitt (1988)	Research	Preliminary survey for early Holocene sites in the southwestern B.C. Interior Plateau region
Peacock (1988)	Analysis	Analytical paper re: pictograph distributions; Upper Similkameen
Vivian (1989a)	AIS, Reconnaissance	Reconnaissance and examination of private collections examinations; Lower and Upper Similkameen
Vivian (1989b)	AIS, Reconnaissance	Site survey and reconnaissance in the Princeton Basin; Upper Similkameen
Bussey (1989)	AIA	Old Hedley Road Lot A, DL 701s; Upper Similkameen
Florian (1990)	Research	Analysis of Guardian Spirit (DhQw–03) pictograph site near Olalla; Lower Similkameen
Boreson (1992)	AIA	Enloe Dam area, Washington
Muir and Rousseau (1992)	AIS, AIA	Similkameen Gorge area; Upper Similkameen
Bailey and Will (1993)	AIA	Proposed gravel pit near Keremeos; Lower Similkameen
Sykes (1993)	AIA	Proposed mobile home park near Keremeos; Lower Similkameen
Copp, Hudson and Webber (1993)	***AIS, AIA***	*Chuchuwayha Indian Reserve #2; Upper Similkameen*

Reference	**Project Type**	**Comments**
Copp, Hudson and Webber (1994)	***AIA, Research***	*Stirling Creek Bridge (DiRa–09); Upper Similkameen*
Eldridge (1994)	AIA	Stirling Creek Bridge (DiRa–09); Upper Similkameen
Copp, Hudson and Webber (1995a)	***AIA***	*Proposed Princeton Business Park; Upper Similkameen*
Copp, Hudson and Webber (1995b)	***AIS, AIA***	*IR #9 (Standing Rock locale), Lower Similkameen*
Copp, Hudson and Webber (1995c)	*AIA*	*Snazai'st Village (DiRa–20), Upper Similkameen*
Copp and Hudson (1995a)	*AIA*	*Murphy (Bear) Lakes MoF SBFEP cut blocks and forestry camp, Tulameen Valley; Upper Similkameen*
Copp and Hudson (1995b)	*AIS, AIA*	*Homestake–Nickel Plate Mine; Upper Similkameen*
Copp and Hudson (1995c)	*AIS, AIA*	*Blind Creek (IR #9); Lower Similkameen*
Copp (1996a)	*AIA*	*MoF SBFEP cut blocks, Tulameen Valley; Upper Similkameen*
Copp (1996b)	*AIA*	*Site DiRa–37 (Stirling Creek Bridge); Upper Similkameen*
Copp (1996c)	*Research*	*Wolf Lake site (DiRb–01); Upper Similkameen*
Handly (1997)	AIA	Tolko Forest Products cut blocks, Tulameen Valley; Upper Similkameen
Copp (1997a)	***AIA***	*MoF SBFEP cut blocks, Jacob Creek; Upper Similkameen*
Copp (1997b)	*AIA*	*MoF SBFEP cut blocks, Whipsaw–Fourteen Mile Creeks; Upper Similkameen*
Copp (1997c)	*AIA*	*MoF SBFEP cut blocks, Winters Creek; Upper Similkameen*
Copp (1997d)	AIA	MoF SBFEP cut blocks, Nicola Valley
Copp (1997e)	*AIA*	*Goldust Gravel Pit (DhRd–04); Upper Similkameen*
Handly (1998)	AIA	MoF SBFEP cut blocks, Tulameen Valley; Upper Similkameen
Copp (1998a)	*AOA, field inspection*	*Pacific West Coal (UK) Ltd. Tulameen Coal Project, Tulameen Valley; Upper Similkameen*
Copp (1998b)	*PFR*	*MoF SBFEP cut block CMT, Copper Mountain; Upper Similkameen*
Copp (1998c)	*AIA, field inspections*	*B.C. Gas Pipeline Right of Way; Lower Similkameen*
Copp (1998d)	*AIS*	*MoF Recreation Camps; Chain, Link and Osprey Lakes; Upper Similkameen*
Copp (1998e)	*AIS*	*Weyerhauser Canada Ltd cut blocks CP 655–3A to 3C, Pasayten River; Upper Similkameen*
Copp (1998f)	*Research*	*Tcutcuwi'xa Rock Shelter (DhRa–02), Upper Similkameen*
Copp (1998g)	*PFR*	*MoF SBFEP, Kennedy Lake area; Upper Similkameen*
Copp (1999a)	PFR	TSL A45592–1. Nicola Valley.
Copp (1999b)	*PFR*	*Wolfe–Belgie and Copper Creek Areas. Upper Similkameen*
Copp (1999c)	*PFR*	*Pasaytan River Area. Upper Similkameen*

Reference	**Project Type**	**Comments**
Copp (1999d)	*PFR*	*Rampart Lake Forest Recreation Camp. Upper Similkameen*
Copp (1999e)	*AIA*	*Golddust Gravel Pit (DhRd–04), Upper Similkameen*
Copp (1999f)	*AOA*	*Riverside Forest Products CP 10–3, 14–5, 8–1 and –3, Upper Similkameen*
Copp (1999g)	*PFR*	*Weyerhaeuser Canada Ltd. CP 673–17, Upper Similkameen*
Copp (1999h)	*AOA*	*MoF SBFEP Wolfe–Belgie and Copper Creek areas; Upper Similkameen*
Copp (1999i)	*AOA*	*MoF SBFEP cut blocks, Pasayten River; Upper Similkameen*
Copp (1999j)	*PFR*	*MoF SBFEP A45592–1; Upper Similkameen*
Copp (1999k)	*PFR*	*MOF SBFEP A62340–1, Calcite Creek; Upper Similkameen*
Copp (1999l)	*Research*	*Snazai'st Village (DiRa–20); Upper Similkameen*
Reimer (2000)	PFR, Research	Cathedral Lakes area; Lower Similkameen
Copp (2000a)	*AIA*	*MoF SBFEP TSL A62350–01, Calcite Creek; Upper Similkameen*
Copp (2000b)	*Research*	*Season 2 (DiRa–20) Snazai'st Village; Upper Similkameen*
Copp (2000c)	*PFR*	*MoF SBFEP TSL A62339–1,2; Upper Similkameen*
Copp (2000d)	*AIA, Research*	*Allenby Lake subdivision; Upper Similkameen*
Copp (2000e)	*AIA, Research*	*Princeton Golf Club; Upper Similkameen*
Copp (2000f)	*Research*	*Snazai'st Village (DiRa–20), IR#2; Upper Similkameen*
Gould and Allison (2000)	PFR	TSL A50512–05; Upper Similkameen
Gould and Copp (2000)	*PFR*	*MoF SBFEP TSL A62339–02 and A63345–05; Upper Similkameen*
Gould and Allison (2001)	PFR	Southwest Upper Similkameen Archaeological Overview Inventory Study
Copp (2001a)	*AIA*	*MoF Ashnola Recreation Camps; Lower Similkameen*
Copp (2001b)	*Research*	*Red Ants site; Upper Similkameen*
Copp (2001c)	*AIA*	*Skemeoskin Reserve; Lower Similkameen*
Copp (2002a)	*AIA*	*Three Crown Lots near Princeton; Upper Similkameen*
Copp (2002b)	*PFR*	*IR # 7 (Skmeoskuankin Reserve); Lower Similkameen*
Bussery, Copp and Praeger (2002, 2004)	*AIA*	*Inland Pacific Connector Pipeline; South Okanagan, Lower and Upper Similkameen*
Copp (2003a)	*AIA*	*Cool Creek (DhQx–10); Lower Similkameen*
Copp (2003b)	*AOA*	*Gorman Bros. Ltd. Ashnola CP26, 1–9; Lower Similkameen*
Copp (2004)	*AOA/AIA*	*Gorman Bros. Ltd. Ashnola Watershed; Lower Similkameen*
Copp (2006)	*AIA*	*Salvage recovery of found human remains, Keremeos, B.C.*

Table 5.4: Similkameen Projectile Points (1994–2003)

Type	Name	Sites	N	Provenience	Date
1	Windust C	DiRc–67	1*	Surface	(8,000–11,000)
2	Cascade C	DiRa–09 DiRa–09 DiRa–24 DhRa–02 DhQx–10 DiRc–66 DhRa–07 DiRa–24	2 1 1 1 3 2 1 1 12*	Sub–surface Sub–surface Sub–surface Sub–surface Sub–surface Surface Surface Surface	7,400 ± 90 6,920 ± 100 4,750 ± 40 3,580 ± 170 > 2,500 (3,000–8,000)
3	Cold Springs	DiRa–9 IPC–24	1 1 2*	Sub–surface Surface	(3,500–7,000)
4	Mahkin Shouldered	DiRc–35 DiRa–09 DiRc–56 DiRc–66	1 2 1 1 5*	Sub–surface Sub–surface Surface Surface	(3,500–9,000)
5	Lehman Oblique–notched	DiRa–09	2*	Surface	(4,000–6,000)
6	Lochnore Side–notched	DiRa–09	1*	Surface	(3,500–5,500)
7	Shuswap 1,2,8	DiRa–09	1*	Surface	(2,500–4,000)
8	Shuswap 3,4	DkRb–02 DiRa–09	1 4 5*	Surface Sub–surface	(2,500–4,000)
9	Shuswap 5	DiRa–09	1*	Surface	(2,500–4,000)
10	Nespelem Bar	DiRa–09 DhQx–10 DiRa–20	2 1 1 4*	Sub–surface Sub–surface Sub–surface (cairn)	1,810 ± 90 3,000–5,000 (1,500–5,000)
11	Rabbit Island A	DiRa–20 DiRa–09 DiRa–20 IPC–09 IPC–14 IPC–16	1 1 1 1 2 1 7*	Sub–surface (hp) Sub–surface Sub–surface (cairn) Surface Surface Surface	1,980 ± 60 1,810 ± 90 (2,000–4,000)
12	Columbia Corner–notched A	DiRa–20 DiRa–09 IPC–30	1 1 1 3*	Sub–surface (hp) Sub–surface Surface	1,980 ± 60 1,810 ± 90 (2,000–4,000)
13	Quilomene Corner–notched A	DiRa–20 IPC–31	1 1 2*	Sub–surface (hp) Surface	1,980 ± 60 (2,000–3,000)
14	Quilomene Basal	–	–	–	(1,500–2,500)
15	Wallula Rectangular Stemmed	DiRa–20 DiRa–09 DhQx–10 DhQx–10 IPC–30	1 1 1 1 1 5*	Sub–surface (hp) Sub–surface Sub–surface Sub–surface Surface	1,980 ± 60 1,810 ± 90 (200–2,000) (200–2,000)

Type	Name	Sites	N	Provenience	Date
16	Columbia Corner–notched B	DiRa–09 DhQx–10	1 4 5*	Sub–surface Sub–surface	1,810 ± 90 (200–2,000)
17a	Plateau Side–notched	DiRa–20 DhQx–10	1 1 2*	Sub–surface (hp) Sub–surface	1,980 ± 60 1,500–2,000 (?)
17b	Plateau Small Side–notched	DiRa–09 DiRa–20 DhQx–10 DkRb–07 DhQx–10 DiRa–20 DhRa–02 IPC–24 IPC–30	1 2 5 1 4 1 1 1 2 18*	Sub–surface Sub–surface Sub–surface Sub–surface Sub–surface Surface Surface Surface Surface	1,810 ± 90 710 ± 40 (200–1,500) (150–1,800)
	total		76**		

* subtotal per type
** total number of points

Table 6.4: Northern Columbia Plateau PMt Sites

Site	Date	1σ	Cultural Affiliation
45D0326	105	55	Hudnut–Coyote Creek *
45DO242 zone 11	230	80	Coyote Creek phase
45D0326	275	75	Hudnut–Coyote Creek *
45DO242 zone 11	330	70	Coyote Creek phase
45DO242 zone 12	540	80	Coyote Creek phase
45DO204 one 1	570	60	Coyote Creek phase
45DO204 zone 1	640	60	Coyote Creek phase
45DO242 zone 12	690	80	Coyote Creek phase
45DO242 zone 12	750	60	Coyote Creek phase
45OK288 zone 3	750	80	Coyote Creek phase
45OK258	800	50	Hudnut–Coyote Creek phases
45D0326	845	75	Hudnut–Coyote Creek *
45DO242 zone 12	920	80	Coyote Creek phase
45OK288 zone 3	960	70	Coyote Creek phase
45OK288 zone 3	1,080	60	Coyote Creek phase
DiQj–5	1,120	100	Deer Park phase: < 3,300 BP
45OK288 zone 3	1,140	40	Coyote Creek phase

Site	Date	1σ	Cultural Affiliation
45D0326	1,300	65	Hudnut–Coyote Creek *
45DO243 zone 22	1,530	60	Coyote Creek phase
45OK288 zone 4	1,560	90	Mixed
45D0326	1,570	55	Hudnut–Coyote Creek *
DiQj–5	1,660	120	
45OK258	2,260	80	Hudnut–Coyote Creek phases
Kettle Falls 45FE45F	2,280	140	undefined phase
45OK258	2,330	110	Hudnut–Coyote Creek phases
45OK258	2,370	70	Hudnut–Coyote Creek phases
45OK258	2,460	100	Hudnut–Coyote Creek phases
DiQm–4	2,530	220	
45DO211 zone 4	2,580	70	Hudnut phase
45OK258	2,640	90	Hudnut–Coyote Creek phases
45OK11	2,650	120	Hudnut phase
45DO204 zone 2	2,660	340	Hudnut phase
45OK258	2,690	90	Hudnut–Coyote Creek phases
45OK258	2,699	230	Hudnut–Coyote Creek phases
45OK258	2,713	210	Hudnut–Coyote Creek phases
Kettle Falls 45FE156	2,750	150	Skitak phase
45OK258	2,750	90	Hudnut–Coyote Creek phases
45OK258	2,770	100	Hudnut–Coyote Creek phases
45DO242 zone 13	2,860	230	Hudnut phase
DiQm–4	2,870	100	Deer Park phase: < 3,300 BP
45OK258	2,936	230	Hudnut–Coyote Creek phases
Kettle Falls 45FE156	2,950	150	
45D0326	2,997	90	Hudnut–Coyote Creek *
45OK258	3,050	50	Hudnut–Coyote Creek phases
45OK18 zone 2	3,090	390	Kartar phase
45OK258	3,250	60	Hudnut–Coyote Creek phases
45OK11	3,337	520	Hudnut phase
45DO242 zone 13	3,510	440	Hudnut phase
45OK18 zone 3	3,512	170	Kartar phase
45OK11	3,584	410	Hudnut phase
45OK258	3,605	480	Hudnut–Coyote Creek phases
45OK11	3,720	160	Hudnut phase
45OK11	3,730	130	Hudnut phase
Kettle Falls 45FE45F	3,770	100	
45DO204 zone 4	3,880	50	Hudnut–Kartar phase

Site	Date	1σ	Cultural Affiliation
45OK11	3,890	100	Hudnut phase
Kettle Falls 45FE45F	3,910	80	
45OK11	3,910	70	Hudnut phase
Site	Date	1σ	Cultural Affiliation
45OK11	3,950	95	Hudnut phase
45OK288 zone 5	3,980	80	Kartar phase
45OK11	4,010	110	Kartar phase
45DO204 zone 3	4,030	100	Kartar phase
45OK382	4,040	110	Kartar B: 3,800–4,350BP
45OK288 zone5	4,070	110	Kartar phase
45OK11	4,100	130	Kartar phase
45OK11	4,130	110	Kartar phase
45OK11	4,160	120	Kartar phase
45OK11	4,170	110	Kartar phase
45OK11	4,200	80	Kartar phase
45OK11	4,240	85	Kartar phase
45OK11	4,250	80	Kartar phase
45OK11	4,390	220	Kartar phase
45OK11	4,420	120	Kartar phase
45OK11	4,440	100	Kartar phase
45OK11	4,490	120	Kartar phase
45OK11	4,680	330	Kartar phase
45OK208 SII (pithouse)	4,950	110	Kartar phase (early pithouse)
Kettle Falls 45ST207	5,980	140	Skitak to Slawntehus phases
			* mixed components

Table 6.8: Dated Plateau/Cascade Range Microcore Sites

PMt Sites:	^{14}C	1σ	cores	Core frags	Mbs	References
British Columbia:						
Landels (EdRi–11)	7,670	80		1	12	Rousseau et al. 1991
Stirling Creek (DiRa–09)	7,400	90	1		137	Copp 1995, 1997a
Stirling Creek (DiRa–09)	6,920	100	10	5	267	Copp 1995, 1997a
Lehman (EdRk–8), zone 2	6,650	110	32		444	Sanger 1970a
Landels (EdRi–11)	6,000	80	2	2	146	Rousseau et al. 1991
Savona (EeRf–1)	4,220	70	2		840	Bussey 1995
Cache Creek (EeRh–3)	3,920	65	13		280	Whitlam 1980
Landels (EdRi–11)	3,250	70	7	3	711	Rousseau et al. 1991

PMt Sites:	^{14}C	1σ	cores	Core frags	Mbs	References
Kettle Falls (45FE156)	2,750	150	6		38	Chance and Chance 1985
Marron Lake (DiQw–02)	2,500	100	8		78	Grabert 1968
Stirling Creek (DiRa–09)	1,800	90	3	1	322	Copp 1995, 1997a
EcRg–2AA (mat lodge)	1,120	170	20	96	724	ARCAS 1983
EdRg–1	140	80	3		97	ARCAS 1986
EeRb–140	140	50	1		800	Nicholas 1999
Columbia Plateau:						
Ryegrass Coulee (45KT88)	6,470	80	7		278	Munsell 1968
PMt Sites:	^{14}C	1σ	cores	Core frags	Mbs	References
45OK18, zone 2	3,090	390		1	64	Jaehnig 1984
Windy Spring (45GR88)	1,080	200	5		22	Osborne 1967; Galm et al. 1981
45OK258	800	50	1		104	Jaehnig 1983
45D0326	275	75	1		?	Campbell 1985
45D0326	105	55	1		?	Campbell 1985
Cascade Range (East):						
Cascadia Cave	7,910	280	6			Newman 1966; Baxter 1986
Layser Cave	6,650	120	3		13	Daugherty et al. 1987b
Layser Cave	6,445	120	3		14	Daugherty et al. 1987b
Judd Peak South	5,930	120	4	3	294	Daugherty et al. 1987a
Layser Cave	5,200	70	5		9	Daugherty et al. 1987b
Judd Peak South	860	90	8	13	128	Daugherty et al. 1987a
Judd Peak North	650	50	10	4	21	Daugherty et al. 1987a
Judd Peak South	310	90		1	2	Daugherty et al. 1987a
Cascade Range (West):						
Skagit (45WH241)	1,430	90	1			Mierendorf et al. 1998
Skagit (45WH283)	1,380	110	4		7	Mierendorf et al. 1998
Tolt River (45KI464)	1,710	110	1			Onat et al. 2001b
Tolt River (45KI464)	4,120 to 6,107	130 178	4	4	12	Onat et al. 2001b
Cascade Pass (45CH221)	7,730	70	1		10	Mierendorf et al. 2006

– APPENDIX D –

CALIBRATED PLATEAU MICROBLADE COMPONENT

RADIOCARBON ESTIMATES

	Date	sd	Cal BP	Min	Max
Similkameen Valley:				@ 2 sigma	@ 2 sigma
Stirling Creek (DiRa–09)	1800	90	1710	1900	1920
Stirling Creek (DiRa–09)	6920	100	7680	7550	7900
Stirling Creek (DiRa–09)	7400	90	8140	7980	8340
Okanagan Valley:					
Marron Lake (DiQw–02)	2500	100	2580	2350	2760
Cascade (East) Range:					
Cascadia Cave	7910	280	8650	8170	9390
Cascadia Cave	6360	210	7230	6780	7570
Cascadia Cave	4920	120	5650	5450	5920
Judd Pk. N	650	50	583	547	665
Judd Pk. N	780	80	670	630	840
Judd Pk. N	800	70	700	650	800
Judd Pk. N	1010	50	930	783	993
Judd Pk. N	1070	120	960	730	1240
Judd Pk. S	310	90	310	250	520
Judd Pk. S	350	50	359	303	496
Judd Pk S	860	90	740	660	930
Judd Pk S	1030	60	940	920	1060
Judd Pk S	1150	60	1060	940	1180
Judd Pk S	1249	120	1170	930	1350
Judd Pk. S	5930	120	6750	6460	7030
Judd Pk. S	5970	100	6830	6540	7030
Layser Cave	3980	70	4420	4230	4620
Layser Cave	5200	70	5940	5860	6110
Layser Cave	6445	120	7330	7150	7530
Layser Cave	6650	120	7500	7270	7660
Cascade (West) Range:					
Skagit (45WH253)	580	80	550	490	670
Skagit (45WH283)	1380	110	1290	1060	1510
Skagit (45WH241)	1430	90	1310	1170	1520
Tolt River (45KI464)	1710	110	1386	1872	1629
Skagit (45WH300)	1750	60	1660	1530	1810
Skagit (45WH300)	1940	90	1870	1690	2110
Tolt River (45KI464)	4120	130	4281	4893	4587
Tolt River (45KI464)	6107	178	6601	7336	6968
Cascade Pass (45CH221)	6730	70	7578	7467	7689
Cascade Pass (45CH221)	7730	70	8514	8395	8632
Highland Valley:					
3 Sisters shelter (EdRi–2)	3470	80	3700	3550	3920
Landels (EdRi–11)	3250	70	3470	3340	3630
Landels (EdRi–11)	5480	70	6290	6170	6410

	Date	sd	Cal BP	Min	Max
Landels (EdRi–11)	6000	80	6820	6660	7030
Landels (EdRi–11)	7670	80	8410	8300	8570
Landels (EdRi–11)	8400	80	9410	9200	9520
EdRg–1	140	80	140	0	290
EcRg–1	210	60	160	60	320
EcRg–2AA (mat lodge)	1120	170	1040	700	1310
EcRg–2AA (mat lodge)	1490	150	1350	1070	1700
EcRg–2AA (mat lodge)	1920	210	1870	1400	2340
Fraser Canyon:					
Drynoch Slide	7530	230	8330	7900	8760
Lochnore (EdRk–7) z. 1	2605	140	2750	2340	2990
Lochnore (EdRk–7) z. 1	2670	140	2760	2350	3080
Lochnore (EdRk–7) z. 1	2680	100	2770	2470	3020
Lochnore (EdRk–7) z. 1	3220	90	3430	3220	3640
Lochnore (EdRk–7) z. 1	3280	125	3470	3210	3740
Lehman (EdRk–8) z. 2	6650	110	7500	7290	7650
Mid Thompson–Fraser:					
Cache Creek EeRh–3)	3920	65	4360	4150	4460
Savona (EeRf–1)	4220	70	4740	4530	4870
Savona (EeRf–1)	4310	60	4860	4810	5040
Savona (EeRf–1)	4310	60			
Savona (EeRf–1)	5390	60	6190	6030	6300
Savona (EeRf–1)	5480	70	6290	6170	6410
Savona (EeRf–1)	5540	70	6310	6200	6460
Savona (EeRf–1)	5670	60	6450	6310	6570
EeRb–140 (Kamloops)	140	50	137	4	155
EeRb–140 (Kamloops)	160	50	143	60	284
EeRb–140 (Kamloops)	210	50	157	126	314
EeRb–140 (Kamloops)	210	40	157	131	233
EeRb–140 (Kamloops)	860	60	740	670	800
EeRb–144 (Kamloops)	5170	60	5920	5850	6040
EeRb–144 (Kamloops)	5250	50	5964	5919	6113
Hat Creek Valley:					
Houth Creek (EeRj–55)	600	40	617	537	649
Houth Creek (EeRj–55)	1220	70	1160	980	1270
Arrow Lakes:					
DiQj–5	1120	100	1040	890	1270
DiQj–5	1660	120	1540	1320	1820
DiQm–4	2870	100	2960	2770	3260
DiQm–4	2530	220	2720	2040	3110
Northeast Washington: Kettle Falls					
Kettle Falls 45FE156	2750	150	2820	2460	3260
Kettle Falls 45FE156	2950	150	3080	2770	3410
Kettle Falls 45ST207	5980	140	6830	6490	7100
Kettle Falls 45FE45F	2280	140	2330	1980	2720
Kettle Falls 45FE45F	3770	100	4110	3870	4410
Kettle Falls 45FE45F	3910	80	4370	4090	4530
Northcentral Washington: Columbia River					
45OK382	4040	110	4470	4230	4830

	Date	sd	Cal BP	Min	Max
45D0326	105	55	60	10	150
45D0326	275	75	300	250	500
45D0326	845	75	730	660	910
45D0326	1300	65	1260	1070	1300
45D0326	1570	55	1420	1330	1550
45D0326	2997	90	3190	2930	3370
45OK208 SII (pithouse)	4950	110	5660	5460	5920
45OK258	800	50	697	652	791
45OK258	2260	80	2320	2010	2380
45OK258	2330	110	2340	2110	2720
45OK258	2370	70	2350	2300	2710
45OK258	2460	100	2480	2330	2750
45OK258	2640	90	2760	2450	2940
45OK258	2690	90	2770	2700	3010
45OK258	2699	230	2780	2310	3370
45OK258	2713	210	2780	2340	3340
45OK258	2750	90	2820	2720	3080
45OK258	2770	100	2860	2730	3160
45OK258	2936	230	3070	2700	3630
45OK258	3050	50	3255	3107	3360
45OK258	3250	60	3470	3360	3620
45OK258	3605	480	3890	2770	5070
45DO204 zone 1	570	60	550	510	650
45DO204 zone 1	640	60	590	540	670
45DO204 zone 2	2660	340	2760	1940	3490
45DO204 zone 3	4030	100	4470	4240	4830
45DO204 zone 4	3880	50	4335	4146	4417
45DO211 zone 4	2580	70	2740	2430	2790
45DO242 zone 11	230	80	290	60	340
45DO242 zone 11	330	70	390	280	510
45DO242 zone 12	540	80	540	440	660
45DO242 zone 12	690	80	650	530	740
45DO242 zone 12	750	60	670	560	610
45DO242 zone 12	920	80	820	680	950
45DO242 zone 13	2860	230	2950	2420	3480
45DO242 zone 13	3510	440	3760	2750	4880
45DO243 zone 22	1530	60	1400	1310	1530
45OK18, zone 2	3090	390	3290	2340	4250
45OK18, zone 3	3512	170	3760	3380	4240
45OK288 zone 3	750	80	670	550	790
45OK288 zone 3	960	70	910	710	980
45OK288 zone 3	1080	60	970	900	1160
45OK288 zone 3	1140	40	1057	955	1159
45OK288 zone 4	1560	90	1410	1290	1620
45OK288 zone 5	3980	80	4420	4220	4640
45OK288 zone5	4070	110	4530	4270	4840
45OK11	2650	120	2760	2360	2990
45OK11	3337	520	3570	2320	4900
45OK11	3584	410	3870	2860	4880
45OK11	3720	160	4030	3640	4450

	Date	sd	Cal BP	Min	Max
45OK11	3730	130	4020	3720	4420
45OK11	3890	100	4330	3990	4560
45OK11	3910	70	4370	4140	4520
45OK11	3950	95	4410	4090	4640
45OK11	4010	110	4490	4220	4730
45OK11	4100	130	4590	4350	4870
45OK11	4130	110	4610	4300	4870
45OK11	4160	120	4680	4400	4990
45OK11	4170	110	4710	4410	4890
45OK11	4200	80	4730	4510	4870
45OK11	4240	85	4830	4530	4990
45OK11	4250	80	4830	4540	4980
45OK11	4390	220	4940	4430	5490
45OK11	4420	120	4990	4810	533
45OK11	4440	100	5010	4840	5310
45OK11	4490	120	5220	4840	5340
45OK11	4680	330	5400	4520	6050
Mid-Columbia River:					
Windy Spring (45GR88)	1080	200	970	660	1340
Ryegrass Coulee (45KT88)	6470	80	7340	7210	7470
Southern Oregon:					
Coquille River (35DO47)	5859	120	6690	6410	6950
Coquille River (35DO47)	6485	80	7380	7220	7470
Marial (35CU84)	8560	90	9490	9380	9690
Standley (35D0182)	310	50	312	282	487
Standley (35D0182)	410	60	490	310	520
Standley (35D0182)	440	50	504	426	542
Standley (35D0182)	980	60	920	740	980
Standley (35D0182)	990	70	920	730	1000
Standley (35D0182)	1060	50	953	903	1067
Standley (35D0182)	1180	70	1070	960	1250
Standley (35D0182)	1480	70	1350	1280	1520
Standley (35D0182)	1720	80	1610	1420	1810
Standley (35D0182)	2300	50	2334	2145	2363
Standley (35D0182)	2350	80	2350	2280	2550
Rogue River: 35JA190	310	70	310	270	510
Rogue River: 34JA189	680	90	650	520	760
Rogue River: 34JA189	710	80	660	540	770
Rogue River: 34JA189	810	130	700	550	950
Rogue River: 34JA189	1150	80	1060	930	1250
Rogue River: 34JA189	1320	110	1270	980	1400
Rogue River: 34JA189	1700	80	1570	1410	1760

– APPENDIX E –

SACRED AND ROCK ART SITES

Considered by the Similkameen First Nations to be of the highest cultural significance, sacred and rock art sites are briefly described for the benefit of past, present and future researchers. Two such categories of sacred sites, Womens' ceremonial boulders and "Coyote" rocks (as well as conventionally–recognized rock art sites) are discussed.

Sacred Sites

Sacred archaeological sites are those that have been identified as such by First Nations peoples, preferably those who have been raised and reside within their traditional territories. Despite a reticence on the part of many First Nations people, identification of sacred sites is sometimes required to avoid damage, or destruction, by land–alterations. Two categories of sacred sites are briefly discussed; 1) Womens' ceremonial boulders, 2) "Coyote" rocks, and 3) Rock art sites.

Womens' Ceremonial Boulder Sites. A total of 19 large, flat–topped boulders exhibiting random to patterned displays of cobbles arranged on upper flat surfaces were recorded in the central Similkameen between 2002 and 2004. Locally referred to as "berry–drying platforms," there is ethnohistoric evidence that these boulder features were the result of patterned cultural activity associated with womens' ceremonies. Teit (1930:282–283) recalled seeing several "flat–topped bowlders" on the Alexis Reserve (IR #9) in Lower Similkameen territory late in the 19th century. His informants indicated that these cobble alignments were made by women undergoing ceremonial training activities. Little is known of the nature of these ceremonies other than the cobbles were placed around the periphery of boulder edges or arranged in patterns on upper flat surfaces. Copp et al. (1995b) located 14 of these sacred boulder features in a survey conducted on the Alexis Reserve (IR #9). Other examples are known to exist on the Blind Creek Reserve (IR #7) in the Lower Similkameen valley, on the Nk'mip (Osoyoos) Reserve in the Okanagan and south along the Okanogan River in Washington State.

Generally, these features consist of clusters of cobbles arranged on flat upper surfaces of boulders measuring no less than two meters in diameter. They vary from a minimum of approximately 0.75 to over four meters in height. Cobbles vary from a minimum of two to a maximum of 20 in patterned arrangements (Figures D.1 and D.2). The location of isolated, paired and clustered boulder features between Blind and Paul Creeks in the central Similkameen

Valley is a strong indicator that this section of the lower Similkameen valley should contain high densities of archaeological sites since ceremonial activities were unlikely to be practiced at great distances from occupation areas.

Figure 9.1: Womens' Ceremonial Boulder Feature (IR 10)

Note: cobble spalls on far side of boulder top opposite notebook

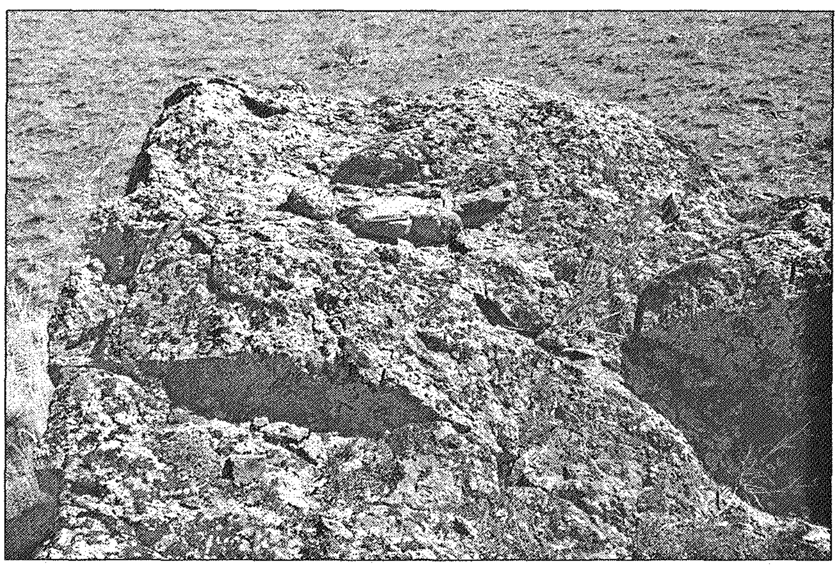

Figure 9.2: Womens' Ceremonial Boulder Feature detail (IR 10)

Note: cobble spalls arranged in a circle at top center of boulder

"Coyote" Rocks. In several locations within the Similkameen Valley, some natural boulders have come to be associated with Coyote, the mythical trickster of Plateau cultures. Although almost nothing is known about these features, other than they are sacred, those that are listed in the British Columbia archaeological site database are recorded in order to mitigate damage or destruction from land–altering activities. Some continue to be used, as evidenced by offerings of tobacco, feathers, coins, shells, firearm cartridges, and other items that change from time to time (see Figures D.3 and D.4). Although a contract was let to local researchers to summarize all known and significant cultural heritage resources by British Columbia Gas prior to the 2002 Inland Pacific Connector pipeline survey (see Appendix A), no information was forthcoming concerning these sites even though two were within the impact zone of the project. Further work is needed to understand these sites, but this will require consent of the First Nations in whose territory the sites are located.

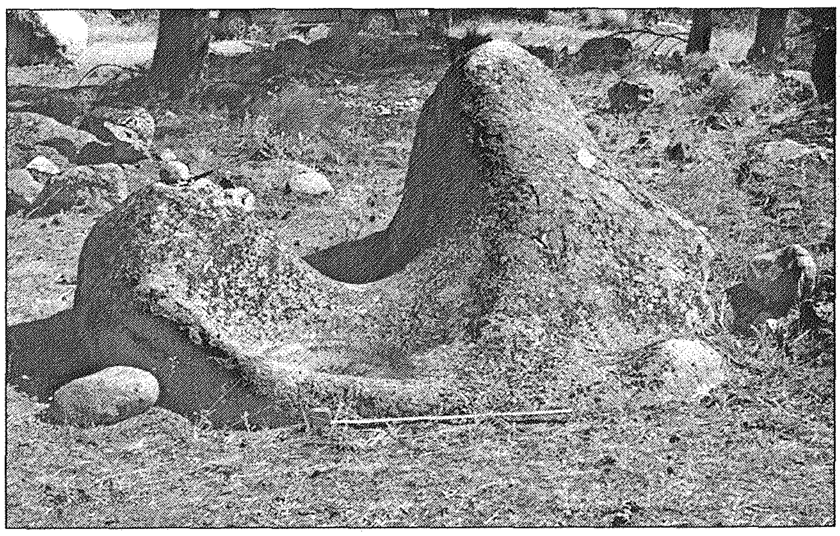

Figure 9.3: Coyote's Washbasin, DhRa–07

Note: offerings are located on the left "horn" of this feature, see Figure 9.4 below

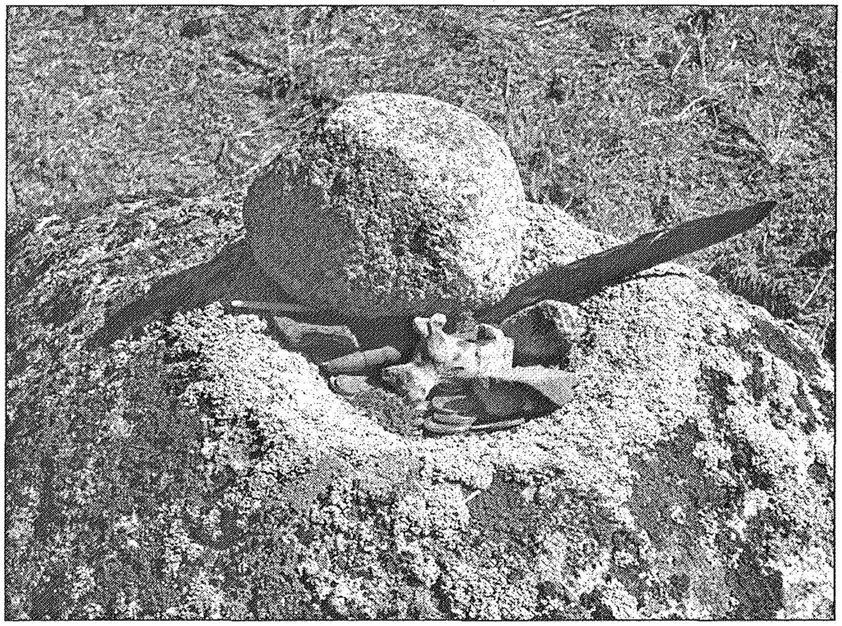

Figure 9.4: Detail, offerings at Coyote's Washbasin

Note: Tobacco and modern artifact offerings. Visible in the photograph are a feature, coins, rifle cartridge and carved steatite horse. These were not part of the feature when observed by the author in 2002.

Similkameen Rock Art

A 20–kilometer section of the Similkameen River between the city of Princeton and the small town of Hedley exhibits one of the densest clusters of rock art sites in the province. All 31 sites are pictographs (rock paintings). To date, no petroglyphs (rock carvings) have been confirmed within the valley. Sixteen additional sites are recorded in the southern valley between Hedley and the international boundary. Site numbers reported are based upon the 2000 Archaeology Branch site inventory database. Three additional rock art sites were recorded recently (Copp 2004; Prager et al. 2004).

Rock art research in the valley has consisted primarily of site recordings with rare projects solely concerned with this class of site (Beauchamp 1978; Corner 1968, 1969; Peacock 1988). Peacock's (1988) is the only research attempting to analyze site locations. Although an admirable first attempt to determine predictive variables for rock art site locations, her study was based upon incomplete and often inaccurate site location data. In general, pictograph sites have been located within 300 to 500 meters of the Similkameen River and/or the base of adjacent mountain slopes. Sites are found on boulders adjacent to the river floodplain, as well as on a succession of terraces grading to the base of the Okanagan and Cascade mountains that flank the valley where boulders adjacent to talus slopes, cliff faces and rock shelters were painted.

Two exceptions to this pattern are pictograph sites located on the Ashnola River, one about 30 kilometers upstream of its confluence with the Similkameen River and the other about 50 kilometers from the confluence. Although pictographs occur on cliff walls and higher terraces of the late Pleistocene Similkameen River, no sites were known to band members within a 20–kilometer stretch of the Ashnola riverside between these two areas (i.e., from the approximate area of Kilometer 30 to 50 of the forest access road that parallels the Ashnola River). The 2004 survey near Kilometer 50 located an additional pictograph in a boulder shelter (DgRc–03).

Predicting rock art site locations is difficult given that idiosyncratic variables appear to be in play. Many hundreds of seemingly paintable rock surfaces abound along major and minor drainage systems within the study area, but few actually exhibit paintings. It is likely that some unknown variables including important events in a painter's associated with particular parts of the landscape, may have played a part in site locations. More work in this area is needed.

A general synthesis of Plateau rock art extending from the southern Fraser to Columbia Plateaus can be found in Keyser (1992). Keyser's analyses constituted a non– statistical definition of several stylistic zones with the Plateaus. Each zone was based upon perceived differences in iconographic style coupled with observed patterning of style elements. The Similkameen Valley falls within his Western Style (zone). The western style is defined through associations of rayed arc (rainbow), human (anthropomorph), zoomorph (animal and bird), spirit figure, tally mark and various abstract images (Keyser 1992: 7–58) (see Figure 9.5).

Dating remains a problem for Similkameen rock art sites. Permission has yet to be granted to obtain pigment samples for AMS dating. The closest dated pictograph was found *in situ* during excavations of the McCall site (DhQv–48) in the south Okanagan Valley (Copp 1979). A conventional radiometric estimate of 2,050 ± 100 BP was obtained on deer vertebrae from the sub–assemblage associated with the pictograph, a 60 centimeter–long battered, elongate cobble (see Fig. D.6). The limited excavations of the Tcutcuwi'xa rock shelter (DhRa–02) revealed several fragments of ochre nodules within the first 20 cm of excavations. These fragments are associated with a single AMS radiometric date on mammal bone of 1,130 ± 100 BP (see Appendix A). Two additional AMS estimates on mammal bone were obtained from cultural strata of 3,280 ±100 and 3,580 ± 150 BP. The latter estimate was obtained several centimeters below a layer of St. Helen's Yn tephra dating ca. 3,500 BP.

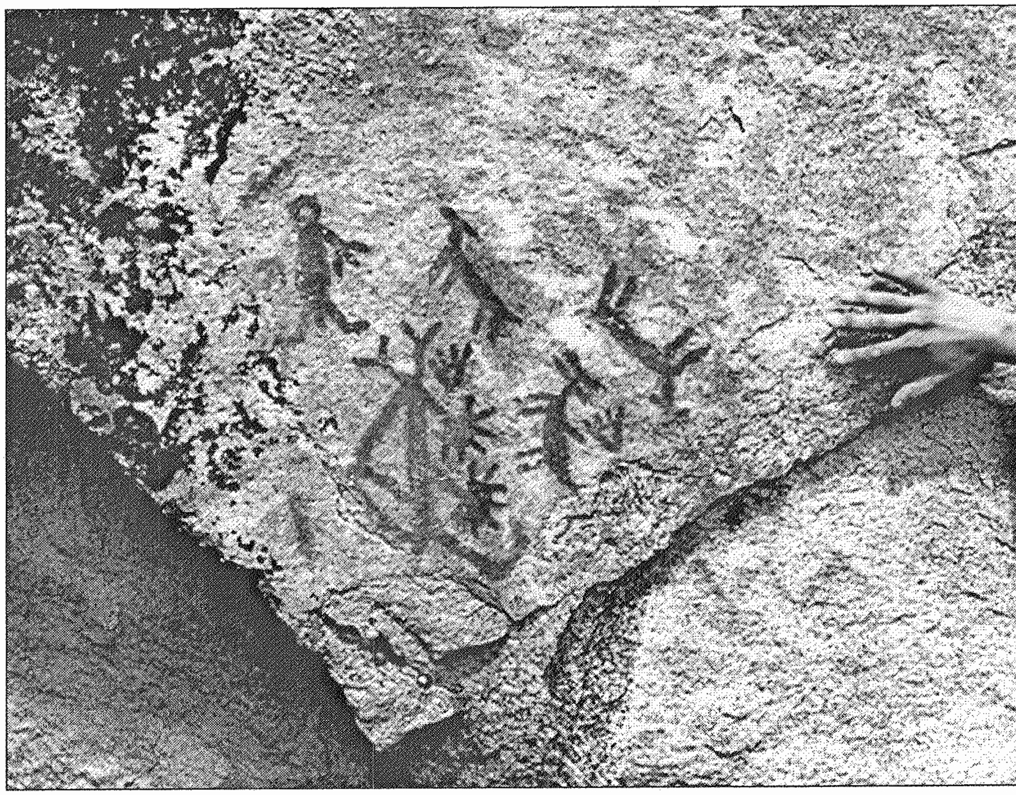

Figure 9.5: Similkameen Pictographs
Note probable shamanic (horned and phalliform) design elements and "bear paw" imagery accompanied by displaced ungulates

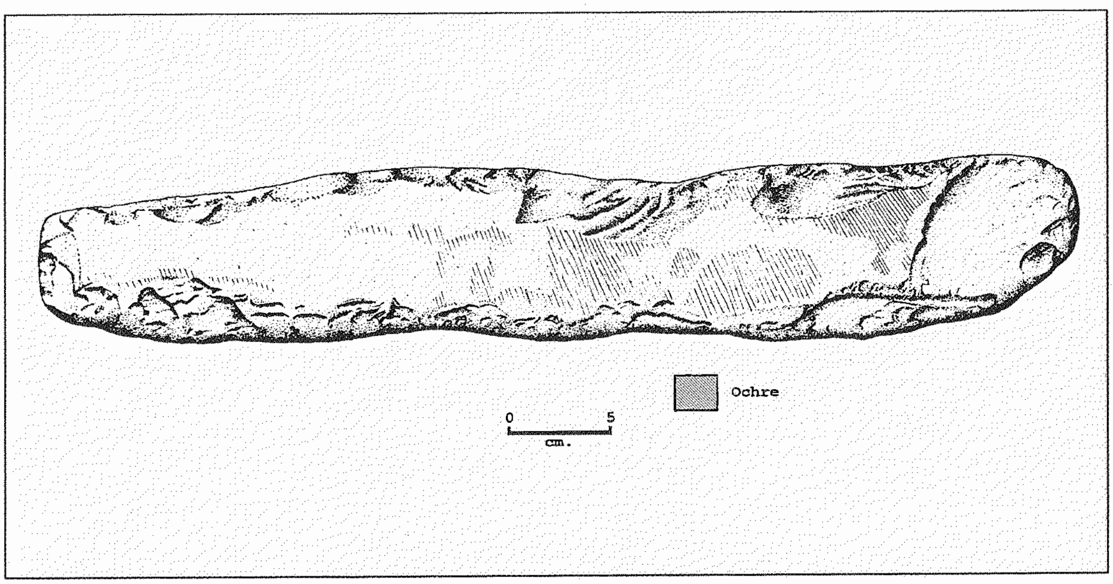

Figure 9.6: DhQv–48 Pictograph
(after Copp 1979: 103)

Interpreting Pictographs

Establishing interpretations of pictograph meanings and contexts have yet to be resolved for the Similkameen Valley. Plausible suggestions for motif meanings can be found in Teit's (1930) discussion of mid Fraser–Thompson rock art and body tattoo motifs, many of which are identical to pictograph symbols. Oral traditions have yet to be gathered and analyzed, such as are presented in York et al. (1993) for Stein Valley sites in southwestern British Columbia.

Contemporary archaeological theories about rock art function, recently summarized by Ross (2001), can be compared with Mallery (1893) to illustrate similarities and differences of interpretive structures. One is late 19th century, the other contemporary, yet both are startlingly similar in terms of establishing (assumed) function(s). Mallery (1893) had the advantage of a long military career involving direct contact with peoples who had recently given up the practice of painting and carving symbols on stone. His study included the following functionally interpretive categories:

- Mnemonic (memory aids);
- Chronological (time and calendars);
- Notices (including topographic features/mapping, information, messages);
- Totems, titles, names (boundary markers, clan symbols, individual status);
- Religion (supernatural motifs, Shamanism, charms, ceremonies);
- Customs (cult associations, daily life, games);
- Historic (events, records, migrations, travels);
- Biographic (individual exploits and events); and
- Ideography (abstract ideas) (Mallery 1893: 223–648).

Contrasting these 19th century conclusions are those of Ross (2001) which indicate that there may still be general agreement with regard to some rock art functions after over 100 years of study:

- Trance shamanism (including entoptic phenomena and phosphenes);
- Shrines ("cult associations");
- Archaeoastronomy;
- Trade markings;
- Hunting (magic, records);
- Puberty/communal rites;
- Riverine, territory and trail/path markers;
- Biographical/narrative records;
- Vision (Spirit) Quest/non–shamanic trance activities; and
- Event/mythological/historical markers (Ross 2001: 545).

A recent synthesis of rock art indicates a neuro–psychological explanation relating to shamanism (Lewis–Williams 2002) that may explain some Similkameen pictograph symbols.

Ethnohistorically–recorded characteristics of shamanic activities include the practice of the Vision or Spirit Quest by which several methods were used to attain an altered state of consciousness. In this state, a spirit helper (Guardian Spirit) was attained and powers (*sumix*) gained. A record of this intensely personal event may then have been painted on rock to commemorate the event. Although Interior Plateau peoples are not generally known to have relied on hallucinogenic drugs to attain altered states of consciousness, an altered state can be achieved through fasting and heavy physical labour. Such visions are known to produce visual patterns known as entoptic phenomena regardless of the method of induction. Classic migraine sufferers are known to experience similar visual disruptions at the onset of a classic migraine attack where levels of the brain chemical serotonin are dramatically reduced – resulting in constriction of the arteries supplying blood to the brain and producing visual disturbances. Various hallucinogenic drugs as well as simple fasting also may produce these phenomena. Lewis–Williams (2002) equates visual disturbances to the early stages of shamanic trances, of which there are three increasingly deeper levels. Several types of rock art images such as whorls, "rainbows", and ladder–like designs are identical to those perceived in early trance stages.

Sexuality also is indicated in some anthropomorphic rock art motifs, the so–called "three–legged men" who appear to exhibit erections. In deeper stages of shamanic trances male shamans have been observed to be dreaming as deduced by brain wave signature patterns, rapid eye movements, accompanied by erections (Lewis–Williams 2002: 176). Figure 9.5 may represent a record of one such event, conducted by one or more males, and characterized by shamanic imagery:

- Anthropomorphs or therianthropomorphs exhibiting erections;
- Anthropomororphs or zoomorphs in non–natural positions ("floating");
- Entoptic phenomena (wavy lines); and/or
- A possible abstract symbol of power represented by the bear paw.

Discussions between the author and representatives of the Upper and Lower Similkameen First Nations have begun with regard to implementation of a future pictograph research design. It includes a larger study entailing landscape archaeology to determine independent and dependent variables oriented towards understanding pictograph locations and predicting currently unknown site locations. It should be noted that pictograph site locations are known within both bands but this knowledge is considered privileged information and may not be divulged easily. This arises from a perspective that many, if not all, pictograph sites are sacred locales. Indeed, some sites in the lower valley are actively used for ritual ceremonies today.

Determining meanings embedded in pictograph symbols requires a thorough knowledge of oral tradition – particularly folklore. It is likely that many pictograph symbols are iconographic representations of cultural belief systems. Although beyond the scope of the limited discussion presented here, it is likely that some aspects of pre–contact semiotic systems can be retrieved from the rock art database.

One of the major obstacles hindering this type of research is the observed tendency for representational images to become abstract symbols over time (cf. Bahn 1997; Leroi– Gourhan 1968). This has apparently resulted in a lack of representational images of bears throughout the Okanagan–Similkameen. For instance, a search of the rock art database shows a single representational image of a bear, apparently grizzly with its distinctive shoulder hump, painted on a rock face in a north–south trending draw high above the eastern shore of Skaha Lake. In fact, "bear" imagery is most commonly restricted to abstract representations of paws. Given that bears are semi–sacred animals re: bear power (sumix), this is not surprising.

A good example of the transformation from representational image to abstract icon can be seen in the West African sankofa image that appears regularly in Ghanaian secular and ceremonial contexts (Figure 9.7). Initially, the image is that of a forward–flying bird looking back along its flight path. This image reflects the Akan proverb … "Se wo were fina wosen kofa a, yenkji" (There is nothing wrong with learning from hindsight). Essentially, the proverb indicates the value of learning from the past. The naturalistic image of a backward–facing bird becomes progressively more abstract until it, and the proverb, can be rendered through the simple image resembling a Western heart sign.

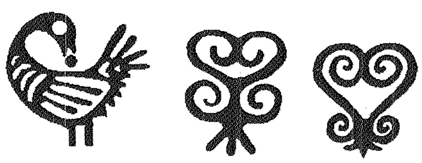

Figure 9.7: Naturalistic to Abstract Symbolism

The point of this discussion is that semiotic meaning is contextual and varies relative to culture and time. As such, unlocking the meaning of Plateau pictographs is unlikely without some grasp of the significance of forager–related worldviews and an acknowledgement of the Hegelian dialectic between those past painters and 21st century scholars attempting to understand their "art".