

**ARCHAEOLOGICAL OVERVIEW OF THE
KAMLOOPS FOREST DISTRICT,
LAND AND RESOURCE
MANAGEMENT PLANNING REGION**

Prepared for:

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1.0 INTRODUCTION

This report summarizes the results of an Archaeological Overview of the Kamloops Forest District, Land and Resource Management Planning (LRMP) region. The overview was conducted by **Arcas** Consulting Archeologists Ltd (**Arcas**), Diana Alexander, M.A. (Consulting Ethnographer), and Terra **Pacific** Information Systems (**TPIS**) for the Archaeology Branch, Ministry of Small Business, Tourism and Culture. It has been prepared in accordance with the "study proposal" prepared by **Arcas** (June 15, 1994) and the guidelines for an Archaeological Overview Assessment in the *British Columbia Archaeological Impact Assessment Guidelines* (Apland and Kenny 1992), issued by the Archaeology Branch.

The primary purpose of the overview was to provide written and mapped information about known archaeological resources, and archaeological resource potential in the Kamloops LRMP region to assist in resource management and land use decision making. The results of this overview consists of three components:

- (1) a report (this document), providing background information and summarizing the results of the overview;
- (2) digitized maps displaying the distribution of known archaeological sites and identifying areas of low, moderate and high archaeological site potential and predicted density, using archaeological resource polygons; and
- (3) two archaeological resource databases, electronically linked to the digitized map set, containing information about each archaeological resource polygon and individual archaeological sites respectively.

It is important to note that this overview is exclusively concerned with archaeological resources. It is not intended to provide a complete synthesis of information on all types of "Heritage Resources" in the study area. Resources such as "Traditional Use Sites", and "Cultural Landscape Features" (as defined by the Heritage Conservation **Branch** 1994) are not dealt with in this study. Furthermore, this overview does not provide a thorough review of the history or ethnography of the study area, though considerable historical and ethnographic information has been incorporated into it.

In this overview, the term "archaeological resources" is synonymous with "archaeological remains," that is, the physical remains found at archaeological sites. Archaeological sites are places containing such material evidence, often in the form of artifacts (objects made or used by people) and alterations to the landscape (such as pit depressions, rock cairns, or bark-stripped trees). Archaeology seeks to understand the human past through the examination of the nature and organization of these remains.

1.1 Objectives

The primary purpose of the study was to provide a synthesis of information on the distribution of archaeological sites in the study area which would assist in land-use and development planning. Specifically, the objectives of the study were to:

- (1) produce a report which describes the methodology used to conduct the study, a summary of previous archaeological research in the region, provides a discussion of the nature and distribution of archaeological resources in the study area, identifies gaps in the current archaeological inventory of the study area, and offers recommendations for further archaeological assessment studies;
- (2) draft a set of digitized maps at a scale of 1:250,000 showing the distribution of known archaeological sites and using “archaeological resource polygons” identify areas of low to high archaeological resource potential and predicted density within the study area; and
- (3) construct databases, electronically linked to the digitized map set, containing detailed information on known sites as well as the types and predicted densities of potential resources for each archaeological resource polygon.

1.2 Study Area

The area included in this study consists of the **Kamloops LRMP** region (Figure 1). The precise boundaries of the study area are somewhat irregular and will not be described in detail here, but generally conform with the boundaries of the Kamloops Forest District. This extends from the Highland Valley and Stump Lake in the South to the headwaters of the North Thompson and Adams Rivers to the north. The Hat Creek Valley is the western-most portion of the study area, which extends east to Little Shuswap and Adams Lakes.

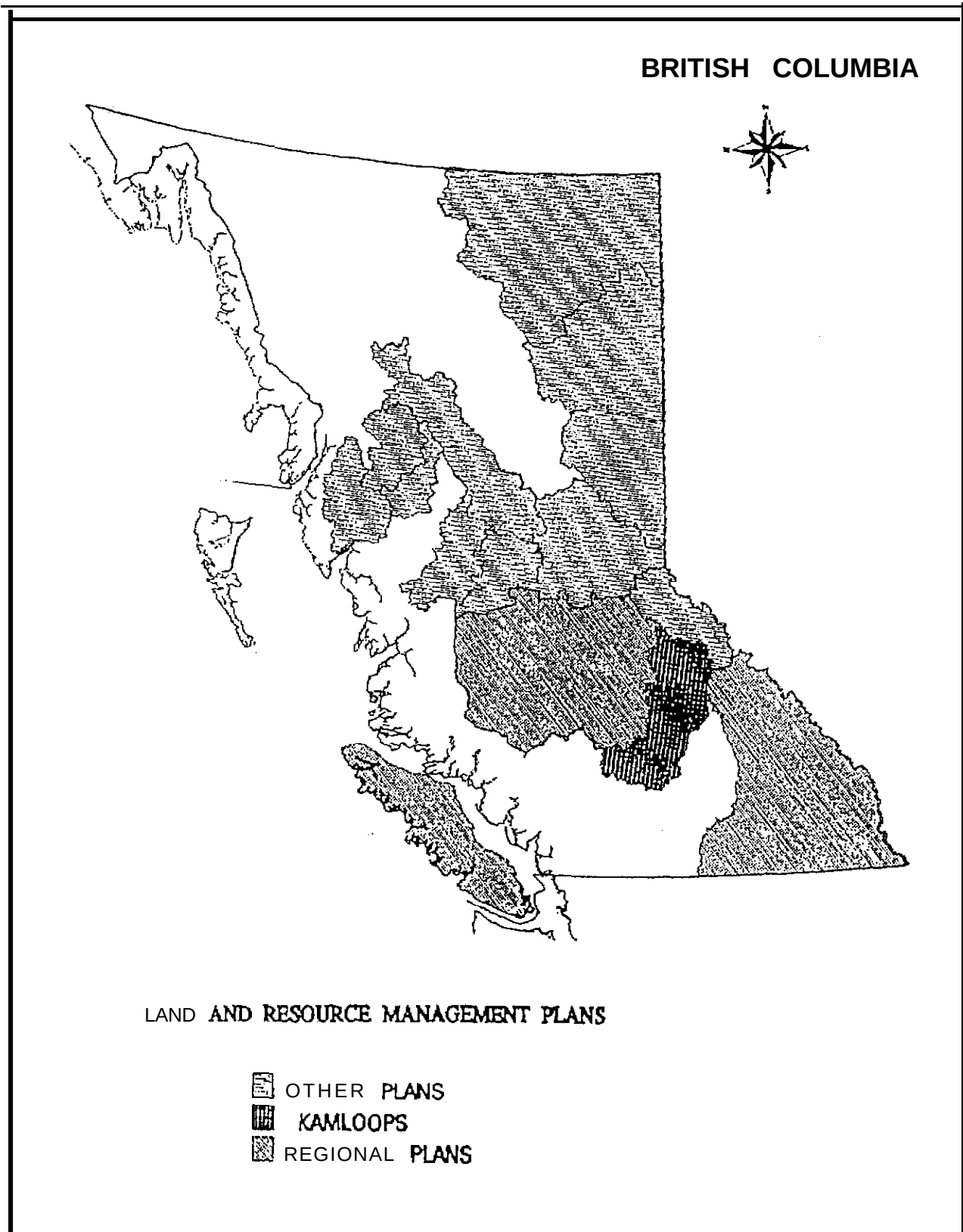


Figure 1. Map of British Columbia indicating the Kamloops Forest District, LRMP region.

2.0 METHODOLOGY

The overview involved:

- (1) a library and records search of archaeological, historical, and palaeo-environmental records pertaining to the study area;
- (2) review of relevant ethnographic sources to collect information on archaeological resource distributions as well as **ethnohistoric** patterns of settlement;
- (3) consultations with individuals and organizations with knowledge of the cultural archaeological resources in the study area, including local First Nations organizations;
- (4) examination of biophysical, topographic and wildlife capability mapping, to assess archaeological resource potential and density throughout the study area;
- (5) digital mapping of archaeological resource potential in the study area, based on information obtained during investigations listed above;
- (6) merging, editing, and evaluating of site inventory records (from CHIN) and digitized site location information (from ARC INFO) for all archaeological sites recorded in the study area; and
- (7) reporting.

2.1 Background Research

Background research for the overview included a review of pertinent records and archival materials. These included numerous publications, professional reports, and archival/archaeological records from the Archaeology Branch, Ministry of the Environment, Department of Indian Affairs, B.C. Archives and Records Service, Royal British Columbia Museum, and other sources. Ethnohistoric information was compiled and reviewed by Diana Alexander while Robert Muir (**Arcas**) examined literature pertaining to regional archaeology, and natural history. Specific information regarding **known** archaeological sites in the study area was obtained from the Canadian Heritage Inventory Network (CHIN) and directly from the Archaeology Branch.

2.2 Consultation

Consultation with First Nations communities consisted of both letter and telephone correspondence. Initially each First Nations Band, Tribal Council, and Educational Society, identified by the Archaeology Branch as being located within the study area, was informed (in

writing) of the nature and scope of the study. The letter also included a request for any information about archaeological resources which they would be willing to contribute. Further inquiries were made by telephone to ensure that the organizations received our letter and understood our request. When requested, additional information regarding the study and/or the principal researchers was sent by mail to the concerned parties. The organizations which were contacted include: North Thompson Band, Kamloops Indian Band, Skeetchestn Band, Oregon Jack Creek Band, Pavilion Indian Band, Upper Nicola Indian Band, Whispering Pines Indian Band, Little Shuswap Band, Neskonlith Band, Adams Lake Indian Band, Shuswap Nation Tribal Council, **Ashcroft** Indian Band, and Bonaparte Indian Band. To date, none of the First Nations organizations contacted have volunteered any additional information specifically regarding the archaeology of the study area.

2.3 Archaeological Resource Potential Assessment

Assessment of archaeological resource potential was based on consideration of the locations and distributions of previously recorded sites, ethnographic and historic information, as well as topographical and biophysical characteristics. Potential mapping was conducted under the premise that archaeological site locations are often correlated with certain **micro**-environmental characteristics, and that the presence and absence of these variables can be used to predict the likelihood of sites. The variables which were considered include ground surface slope, proximity to potable water and aquatic resources, drainage quality, wildlife values, view of surrounding terrain, aspect (i.e., solar exposure based on valley side and direction of slope), and vegetation/forest cover. Results of previous large scale archaeological inventory studies conducted in the Study Area (particularly **Arcas** 1987, 1994; **Beirne** and Pokotylo 1979; Brown and **Lundborg** 1977; Mohs 1978; Rousseau et *al*, 1989, 1991; and Rousseau and Friele 1986), numerous smaller scale studies, and ethnographic information on traditional resource use and settlement patterns have been used to model the relationships between archaeological resource distributions and such biophysical characteristics (see section 6.0 below).

2.4 Mapping

The **study** included preparation of an archaeological resource map set indicating (1) known archaeological sites, and (2) archaeological resource potential throughout the study area.

2.4.1 Archaeological Potential Mapping

The study area has been divided into 189 archaeological resource polygons based on assessed potential for archaeological resources and predicted site densities. **Each** polygon is linked to a database record which provides information about known and assessed values for each of the following data fields:

Archaeological Potential (Potential) -- The archaeological potential value (High, Medium or Low) reflects the assessed probability of archaeological sites existing within the polygon. Polygons with **High** potential ratings will almost certainly contain unrecorded archaeological sites, while those with **Low** ratings have only a slim probability of containing sites.

Predicted Density (Density) -- Each polygon is assigned a predicted site density value of high, medium or low. This value reflects the probable density of archaeological sites within the polygon area. Polygons with **High** density ratings are predicted (or known) to have 10 or more archaeological sites per square kilometre. **Medium** density polygons are likely to have between 1 and 10 sites per square kilometre, while **Low** density polygons are likely to have less than 1 site per square kilometre. These values are based on known site densities for portions of the study area which have been intensively investigated (see Section 6.2 below).

Known Site Types: Prehistoric (Known-P) -- This field lists the types of prehistoric archaeological sites known to exist in a particular polygon.

Known Site Types: Historic (Known-H) -- This field lists the types of historic archaeological sites known to exist in a particular polygon.

Predicted Site Types: Prehistoric (Predicted-P) -- This field lists the types of prehistoric archaeological sites anticipated in a particular polygon.

Predicted Site Types: Historic (Predicted-H) -- This field lists the types of historic archaeological sites anticipated in a particular polygon.

Assessment Confidence (Confidence) -- An assessment confidence rating of high, medium or low is assigned to each polygon. **High** applies to polygons which encompass areas that have been relatively intensively investigated by previous researchers, and thus assessments are based on considerable data. **Medium** confidence has been assigned to polygons within which some research has been conducted but not in an intensive or systematic nature. Low confidence was assigned to polygons within which very little or no previous archaeological research has been conducted.

2.4.2 Documenting Known Archaeological Sites

In order to classify the kinds of archaeological sites already known in the study area, a modified version of the archaeological site **typology** utilized by the Archaeology Branch for recording archaeological sites was used. Generally speaking, sites are divided into two general classes: prehistoric and historic. For the purposes of this study, “prehistoric” refers to remains resulting from traditional aboriginal activities, whereas “historic” refers to remains resulting from non-aboriginal settlement and land use, or non-traditional aboriginal activities. Most of

the prehistoric sites in the study area were occupied before first contact with Europeans early in the 19th century, but some sites classified as “prehistoric” probably post-date this initial contact because they represent traditional activities. Historic sites often incorporate ruined or intact structural remains (“built heritage”, including residences, and outbuildings), but may also include historic roads and trails, single **objects** such as abandoned machines, and featureless sites such as garbage dumps.

The site **typology** used by the Archaeology Branch is based on a hierarchical system of Descriptors, representing different types of features, described with numerous Modifiers combined in different ways to form many different types of sites. This descriptive system may not be intuitively comprehensible to resource planners from other fields who are not conversant with archaeological jargon. In order to avoid an overly-complex site typology, sites are described in this overview in terms of the archaeological resources believed to be dominant at each site. This results in an intuitive system with a mix of site categories that may either be descriptive (e.g., habitation, campsite, rock art), environmental (e.g., rock shelter), or represent particular feature types (e.g., petroform, burial).

Potentially, a large number of archaeological site types could be defined for a complex study area such as the Kamloops LRMP region. In order to have a manageable number of site types for descriptive and tabulating purposes, archaeological sites were grouped into eighteen types (see section 5.3). These types encompass all of the possible archaeological resources likely to be found in the study area.

Each site is linked to a database record which provides information about known and assessed values for each of the following data fields: borden number, site class (Historic or Prehistoric), site type, site size (in m^2), most recent recorder, year of most recent recording, and all relevant permits issued.

3.0 PHYSICAL SETTING

The Kamloops Forest District LRMP region surrounds and includes much of the Thompson River drainage area, including all of the North Thompson and the south Thompson drainage from the mouth of Shuswap Lake to Kamloops. The study area follows the Thompson River as far south as **Spences** Bridge, approximately 25 km northeast of the Fraser and Thompson River's confluence at Lytton. Major lakes in the study area include Kamloops Lake, Little Shuswap Lake, Adams Lake, **Mahood** Lake, Murtle Lake, Clearwater Lake, Azure Lake and Hobson Lake. Many lesser lakes are scattered throughout the study area, particularly along its northwestern margin.

3.1 Post Glacial Geomorphology

Recent palaeoenvironmental studies indicate that the Cordilleran Ice Sheet of the Vashon Stade covered all of southern British Columbia until about 13,000 years ago (Ferguson and Osborn 1981, Hebda 1982; Clague 1981). Most upland areas of south-central B.C. were deglaciated between 13,000 and 12,000 years B.P.; however, large ice-masses remained in the major valley bottoms until as late as 10,000 years B.P. (Clague 1981; Hebda 1982, 1983; **Mathewes** 1973, 1985; Fulton and Smith 1978; **Mathewes** and Rouse 1975). Down-wasting of ice masses first occurred in the hilly uplands, leaving behind trunk-valley glaciers, stagnant blocks, and a **piedmont** apron of ice along the eastern and western fronts of the Coast and Caribon Mountains respectively (Clague 1981). As the ice-sheet wasted away, **meltout** drift punctuated by kettle and kame topography and course-grained meltwater deposits were left behind. The results can be seen in the uplands south of Kamloops, which are characterized by small deltas, ice marginal terraces, and veneers of lag gravel. The gravel deposits were formed during deglaciation while ice occupied the valleys and depressions, and most drainage was along the ice margins. Terraces **and** abandoned channels suggest that silt-laden meltwater flowed into the valley from the south of Kamloops. There are no ice-marginal terraces or other evidence of meltwater flow in the Thompson or North Thompson Valleys (Fulton 1965).

As down-wasting freed the uplands, stagnant ice tongues remained in the valleys, obstructing flow of meltwater and producing glacial lakes (**Fulton** 1965). Within the study area, Glacial Lake Thompson (**Mathews** 1944) began to form in the South Thompson Valley, near Monte Creek, between ice tongues retreating to the west and east (**Fulton 1965:553**). Similar lakes formed in the Nicola, **Ashcroft** and possibly Adams Lake areas (Fulton 1969). As the lakes expanded deposits of silt, up to 150 m thick, were spread across the valley floors. The exact level of Lake Thompson is not known; however, the maximum lake level could not have been lower than 500 m asl, based on the highest occurrence of deposited silt. The lowest kettled terrace at Kamloops has an altitude of about 530 m asl; so Lake Thompson was at this level or lower when the South Thompson silt was deposited (Fulton 1965). From this it may be concluded that Lake Thompson stood between 500 and 530 m **asl** during silt deposition.

Through time Lake Thompson expanded westward while its eastern margin contracted, eventually forming a much larger version of present day Kamloops Lake. Headwater erosion upstream from Kamloops Lake in the South Thompson River Valley, eventually cut through the South Thompson silts and captured the waters of Shuswap basin from the Okanagan-Columbia River Drainage. This extra flow into the Thompson River probably initiated the phase of downcutting that lowered Kamloops Lake to its present level (Fulton 1969).

3.2 Palaeoenvironment

As the uplands within the study area began to deglaciate (between 13,000 and 12,000 years B.P.), plant and animal populations gradually became re-established. During this time the study area consisted of a treeless landscape consisting of pioneering grasslands in the uplands and extensive ice-filled valleys (Hebda 1983). Forests gradually became established between 12,000 and 10,000 years B.P. and the valley bottoms were deglaciated and populated by grasslands (Hebda 1983). Near the end of this period (ca. 10,500 years B.P.), a shift to a warmer and drier climate appears to have begun, as indicated by increases in Douglas fir, grasses and sages and a corresponding decrease in *Pinus* species (Mathewes 1973, 1985). Between 10,000 and 7,500 years B.P. sage-grasslands became wide-spread throughout the southern interior of British Columbia, particularly at lower elevations. In very arid areas valley-bottom grasslands may have expanded to merge with alpine grasslands (Hebda 1983). Forest vegetation was probably restricted to upper elevations and moist north-facing slopes during this time. Shortly after or near the end of this period (8,000 to 7,000 years B.P.) the climate again shifted, gradually becoming moister and cooler (Alley 1976, King 1980, Hebda 1982, Mathewes 1985).

From ca. 8,000 to 4,500 BP grasslands receded and xeric taxa (e.g., sages) were largely replaced by mesic-adapted grass species (Hebda 1983). Expansion of Ponderosa pine and Douglas fir forests occurred throughout upland and northern areas and eventually descended to elevations just above modern levels (Hebda 1982). From ca. 4,500 to 3,000 years B.P., the cool and moist climate persisted, and grasslands became restricted to the valley bottoms. Soon after this the climate became slightly drier, and modern vegetation boundaries were established. Historic colonization and land development have no doubt had some effect on the distribution of vegetation, though such effects have not been extensively studied. There is some evidence that logging and cattle ranching may have resulted in increased abundance of sagebrush at the expense of grasses and trees (Anderson 1973, Cawker 1978). Land clearing for farming has also resulted in increased populations of poplar, alder, willow and weedy herbs (Hebda 1983).

3.3 Modern Environment

The study area falls within two major physiographic regions which to a large degree dictate local climate, flora and fauna. The northern portion of the study area largely lies within the Shuswap Highlands of the Interior Plateau. The Shuswap Highlands fall within the "interior

wet belt”, a zone of relatively high precipitation and forests dominated by western hemlock and to a lesser extent, western red cedar. This is a relatively mountainous area characterized by steep river and creek valleys with forested slopes. Stands of Englemann spruce, sub-alpine fir and lodgepole pine are common at upper elevations. Alpine areas are common to the larger mountains. Indigenous wildlife species include mountain goat, caribou, deer, moose, beaver, and a variety of waterfowl. Chinook, **coho**, and sockeye are important fish species, and an important sockeye “run” ascends the Raft and **Clearwater** Rivers.

South of Clearwater the study area lies within the Thompson Plateau of the Interior Plateau. The Thompson Plateau is characterized by rolling uplands of low relief, low precipitation, and considerable seasonal temperature fluctuation. This is an area of open Ponderosa pine and Douglas-fir forests, and semi-arid grasslands dominated by **bunchgrass**. **Local** flora in the southwestern portion of the study area is dominated by **xeric** species, and includes sagebrush, bunchgrass, cactus, ponderosa pine, and saskatoon. Upper elevation areas, and much of the southeastern portion of the study area, are forested with stands of Douglas fir and occasionally lodgepole and ponderosa pine.

The rivers throughout the southern portion of the study area support very large anadromous salmon populations, as well as other **fish** species. Important local fauna include mule deer, elk, coyote, snowshoe hare, black bear, marmot, and grouse. Annual precipitation is about 25 cm; summers are hot and dry, and winters are cold and dry. Local topography is typified by extensive series of open, steep-sided, river terraces flanking the main river/creek valleys. Tributary drainages are generally small, steep sided, and support fairly dense **riparian** floral communities along streams that flow year-round.

4.0 ETHNOGRAPHIC OVERVIEW By Diana Alexander

4.1 Native Groups in the Kamloops Forest District, LRMP Region

In the early 1800's, lands within the Kamloops Forest District, LRMP region (study area) were primarily occupied by the Shuswap (Teit 1909:450), one of four ethnolinguistic groups that make up the Interior Salish division of the Salish language family (Duff 1969:29-32) (Figure 2). Two other Interior Salish groups, the Thompson and Okanagan-Colville, claimed a small portion of the study area along its southern border, on the south side of the Thompson River (Teit 1909:450, 1900:166). It was not uncommon for disputes to arise in an area where three groups shared a border and in fact, oral traditions and historic observations indicate that in the last 300 years the lands along the southern border of the study area changed hands several times (Teit 1979:10-11; Teit 1930a:214, 1900:178, 1909:463; Kennedy and Bouchard 1985:70-80, 1987: 125-6; Smith 1900:406-7). For example, the Thompson, who now claim the Thompson River as far north as Semlin were, at contact, located below Basque (Teit 1909:463). The Nicola Valley, just south of the study area, was heavily contested by several groups only after the introduction of the horse, when the plentiful grazing lands in the valley became a great attraction. As a result, the Shuswap, Thompson, and Okanagan-Colville may all have occupied this southern part of the study area at sometime in the late prehistoric period.

Almost all of the lands immediately surrounding the study area were also occupied by these three groups. A notable exception was encountered in the Nicola Valley just south of the study area (Figure 3). This valley was once used by an isolated group of now-extinct Athapaskan-speakers known as the Nicola. The origins and history of this group are not well known, and the length of their occupation of the Nicola Valley is uncertain (Boas 1896; Kennedy and Bouchard 1987b:125-6, 1985:70-80). They may have displaced the Thompson several hundred years ago, only to lose their separate identity through intermarriage with the Thompson (Teit 1979). By 1800, the Nicola did not occupy any lands in the study area, but they may have travelled into southern portions on occasion, and the possibility exists that they may have occupied some of these lands in the past.

The Shuswap were divided into seven geographically and linguistically distinct subgroups or divisions (Teit 1909:450). Five of these subgroups claimed territory in the study area: (1) Lake, (2) North Thompson, (3) Kamloops, and (4) Shuswap Lake, (5) Bonaparte. Similarly, the Thompson were divided into two major subgroups with the Upper Thompson occupying the study area (Teit 1900:168-9). The Upper Thompson were further divided into four smaller subgroups, two of which, the Spences Bridge and Nicola subgroups, claimed lands in the study area. Of the seven Okanagan-Colville subgroups, only the Northern Okanagan used the study area. These subgroups were comprised of neighbouring bands linked to each other by marriage, kinship, and frequent association. Bands within these subgroups tended to share resources with each other more frequently than with other bands in the area. People within each ethnolinguistic group and subgroup shared the same language, culture and history, but these groups did not function as social or political units (Duff 1969:12-15).

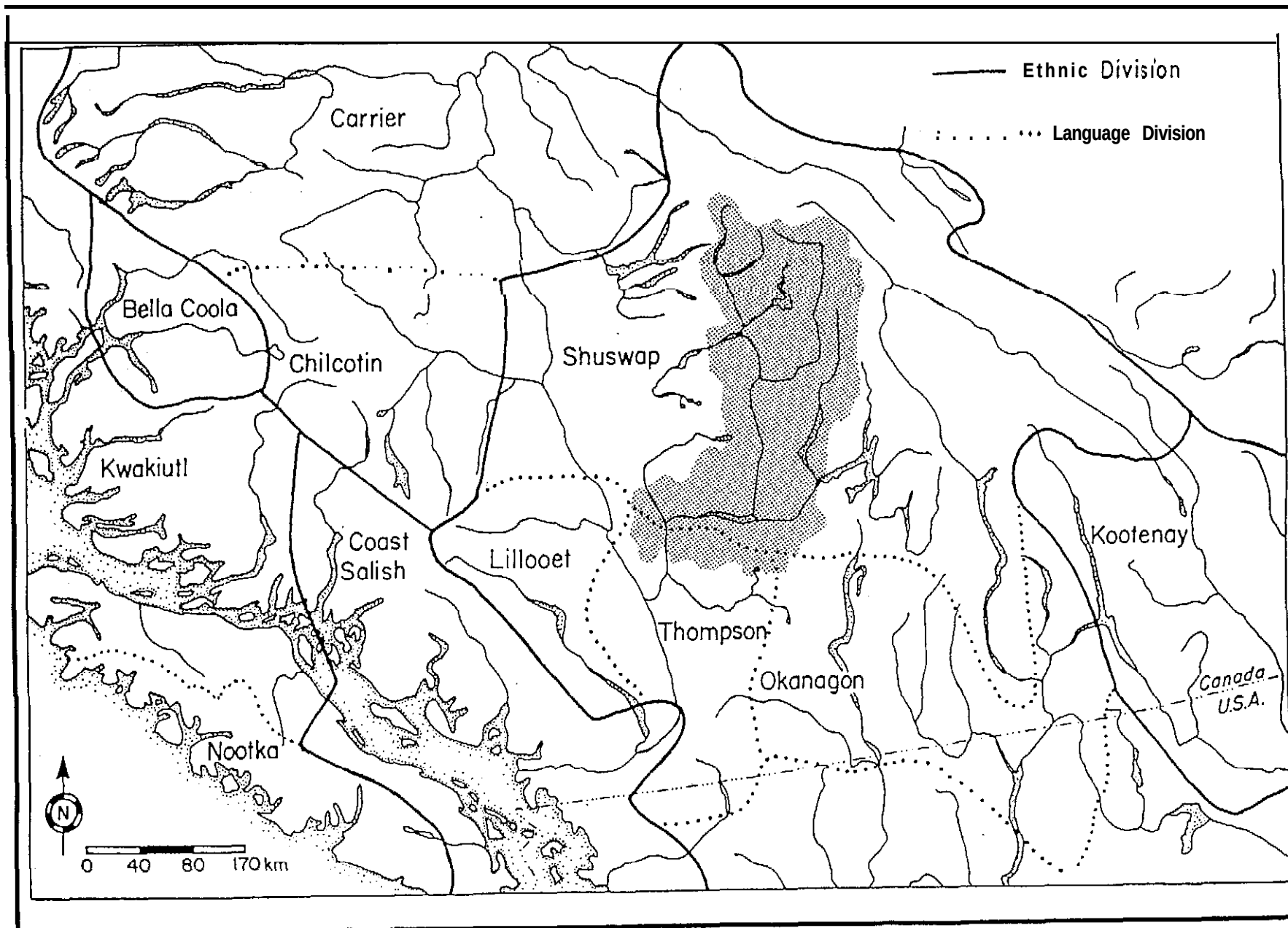


Figure 2. Map of Ethnolinguistic Groups in Southern B.C., circa 1850; shading indicates extent of study area.

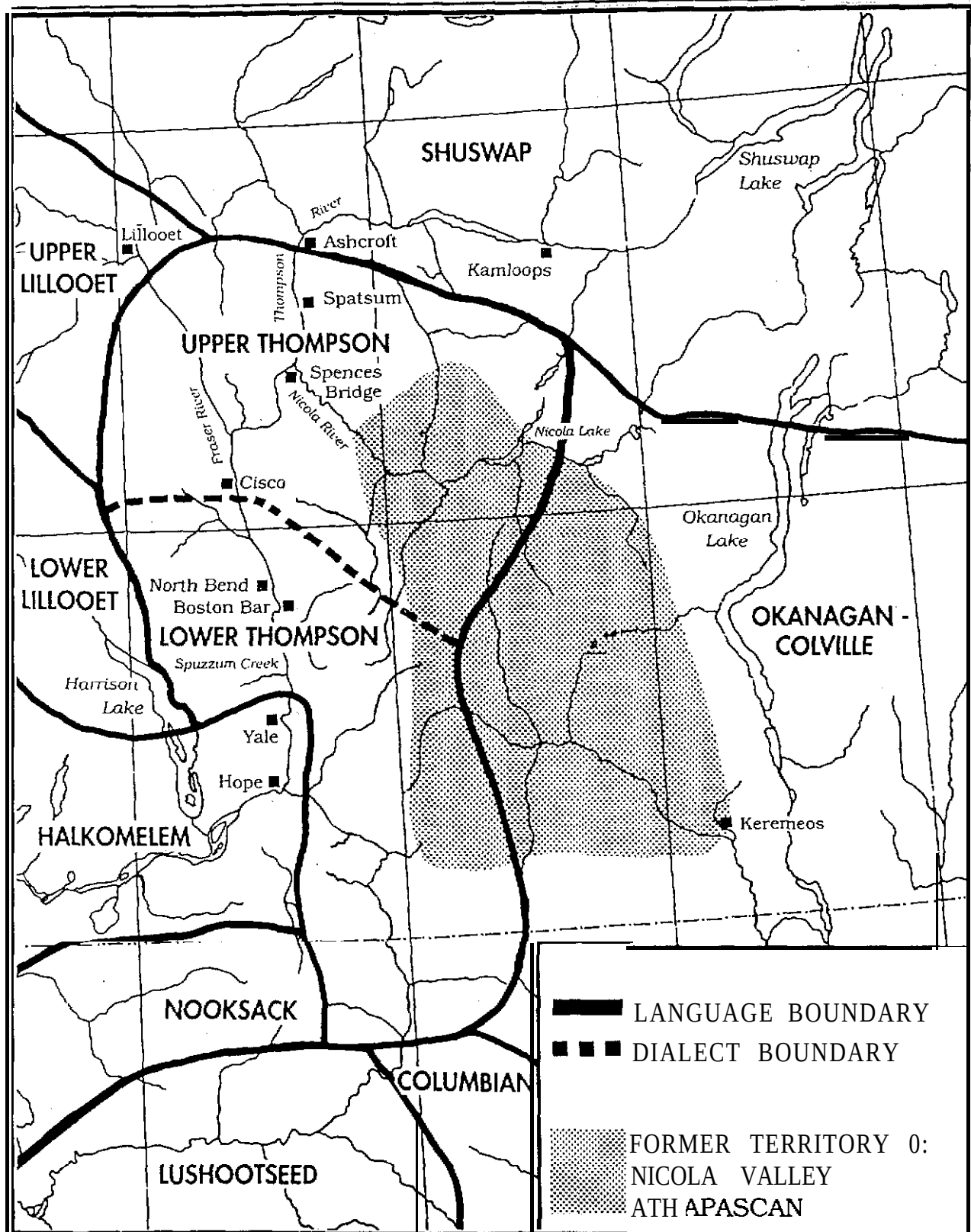


Figure 3. Traditional Territory of the Nicola Athapaskans. Redrawn from Teit (1900:166), as presented in Turner *et al.* 1990.

Table 1. Native Groups in the Kamloops Forest District.

Language Family	Ethnolinguistic Group	Regional Subgroup	Band ca. 1850	Population ca. 1850
Interior Salish	Shuswap	Kamloops	Deadman's Creek* Kamloops*	350 550
		Lake	Canim Lake* Green Timber	350 100
		Bonaparte	Pavilion* Bonaparte* Main Thompson	150 400 (300) 150
		North Thompson	Upper North Thompson* Lower North Thompson*	250 500
		Shuswap Lake	South Thompson* Adams Lake* Shuswap Lake*	400 400 200
	Thompson	Upper Thompson: Spences Bridge Upper Thompson: Nicola	Not clearly defined Not clearly defined	
	Okanagan-Colville	Northern Okanagan	Not clearly defined	

*These bands are still in existence, though some now have different names. The population estimate in brackets indicates a population high prior to 1850. Information for this table was compiled from Duff (1967) and Teit (1909).

Traditionally, the Shuswap, Thompson, and Okanagan-Colville were band societies. Each band was composed of a group of closely related families who usually wintered at, or within a few kilometres of a larger village (Dawson 1892:4-7; Teit 1909:457, 1930a:261-2, 1900:170-1; Ray 1939:14-7; Hudson 1990:68-75). The bands were social communities with common interests, but they were not political units. Land was recognized as part of a band's territory as long as members of the band were using the resources on that land. Band membership often changed from year to year, with people from a small village equidistant from two main villages sometimes shifting affiliation from one band to another (Teit 1909:457). As a result, a band's territorial boundaries could change with time (Alexander 1992b: 142-4). Those bands known to have occupied the study area in 1850 are listed in Table 1.

The village was the basic political unit, with each village having a number of leaders or chiefs selected for their skills in fishing, hunting, war, or oratory. Decisions were, however, made communally with each adult male having equal rights and responsibilities. Hunting and

trapping grounds, trails, berry-picking areas, and root-digging grounds were the common property of the ethnolinguistic group, although each band had their own habitual resource areas near their home (Teit 1906:256, 1909:572-3, 1900:293-4; Boas 1891:638; Alexander 1992b:142-4). Some salmon-fishing stations were individually owned, while others were owned by residence groups or the ethno-linguistic group (Kennedy and Bouchard 1992:305-16).

4.2 Scope and Objective of the Ethnographic Overview

This summary of traditional Native practices examines those aspects of the ethnographic record that are most effective in predicting the size, content, and location of prehistoric sites in the study area. Information on political organization, mythology, art, music, ritual, and religion provides few clues that would assist in the discovery of visible archaeological remains. Consequently, the following summary focuses on an analysis of environmental data and traditional land use patterns, but provides little discussion of social and religious practices.

No attempt is made to predict the location of places having social, religious or other cultural significance to living communities. Such information can only be acquired through extensive direct consultation with band members.

All Interior Salish bands followed the same general land use pattern, but the emphasis of certain activities changed slightly from band to band, depending on the abundance of various food resources. Unfortunately, early ethnographers rarely described the specific practices of individual bands or subgroups and provided little information on the use of specific localities. Most of the recent work by ethnographers, ethnoarchaeologists, and First Nations organizations has focused on collecting this band-specific information, but for some bands this information is available only in the (as yet unrecorded) oral histories of elders. Ideally, any study of Traditional Native land use should include consultation with elders. Archival research can also produce valuable insights, though it is very time consuming and often yields little information relative to the effort expended. The terms of reference for this study precluded both archival research and intensive consultation. Any future work in the study area should include consultation with Native elders and if possible, an exploration of archival material.

Native cultures have changed significantly in the last 200 years. The fur trade, disease, mining, farming, ranching, logging, and urban development have all had a profound effect on Native lifeways (e.g., Duff 1969; Drake-Terry 1989; Turner 1992:408-11; Mellows 1990). This summary attempts to reconstruct traditional Native land use practices, that is, subsistence and settlement patterns as they existed before the arrival of Euro-Canadians in the early 1800's. Since this report is intended, in part, for a lay audience, the most commonly used, anglicized versions of the Native names are employed.

4.3 Primary Sources of Ethnographic Information

4.3.1 Shuswap

Boas was the first ethnographer to work among the Shuswap, but he provided only a very short overview (1891) and a discussion of basketry (1908). Dawson (1892) wrote a brief account of the Shuswap based on his observations while doing geological work in the 1870's. His work is reliable, but contains little information on land use practices. Curtis (1911) also wrote a brief general ethnography, however, the most reliable and detailed account of the Shuswap was written by Teit, who produced systematic ethnographies of the Thompson (1900), Lillooet (1906) and Shuswap (1909, 1930a) in the 1890's. He was married to a Thompson woman and his observations are invaluable sources of information on traditional lifeways. He collected the bulk of his Shuswap information from several old men from the Dog and Canoe Creek Bands, but he also visited most other Shuswap bands for his study.

More recent work has also added to our knowledge of land use practices in the study area. Ray (1939, 1942) included the Shuswap in his 1930's cross-cultural studies of Interior Plateau cultures. Unfortunately, his Shuswap research was limited to one week with a single Soda Creek informant and his study fails to recognize differences between the Shuswap subgroups and bands. Depending heavily on the work of earlier ethnographers, Palmer examined Shuswap ethnobotany (1975a) and cultural ecology (1975b). Bouchard and Kennedy worked with the Shuswap to produce a book of stories (1979) and two appendices to reports of archaeological investigations in the Thompson River Valley (Bouchard and Kennedy 1990; Kennedy and Bouchard 1987a). Information on the construction of Shuswap pithouses is provided in Caron (1986), Smyly (1973), and Surtees (1974).

4.3.2 Thompson

Teit's (1900) extended first-hand report is the richest source of information on the Thompson. His monograph, prepared in 1895 and 1897, was largely based on his work with the Upper Thompson, the group with whom he was most familiar. The data are especially rich in the material culture sections, but his discussion of land use practices is uneven. Teit produced another short study on Thompson tattooing and body painting (1930b) and made an extensive collection of Thompson myths (1898, 1912, 1917, 1937). Hill-Tout (1900, 1978a) also undertook a field study of the Upper Thompson in the 1890's, but, unfortunately his work contains little information on land use practices. Though he had a highly intelligent informant for this study, Hill-Tout was an untrained ethnographer, and naive in his descriptions and theoretical underpinnings, as well as curiously wandering and irrelevant. Ray's cultural-element check-list (1942) and broad comparative study (1939) of Plateau cultures also includes some information on the Thompson as does Curbs's (1911) general overview.

Thompson ethnobotany was summarized in an early study by Steedman (1930) which was produced from Teit's notes and later expanded with new ethnographic research by Turner

(Turner et al, 1990). Dorothy Kennedy and Randy Bouchard (British Columbia Indian Language Project) conducted linguistic and ethnohistoric research with the Thompson. Where their studies were undertaken in conjunction with archaeological projects, the reports have included information on the location of traditional camps and villages as well as the construction of pithouses, features, and tools (Bouchard and Kennedy 1985, Kennedy and Bouchard 1985, 1987b). Jorgensen's (1980) comparison of 172 western tribes also includes references to Interior Plateau cultures, while Smith (1988) provides a summary of ethnographic evidence on the Lower Thompson. Information on the construction of Shuswap pithouses is provided in **Laforet** and York (1981). Ethnoarchaeological studies have also been undertaken with elders from the **Ashcroft** Band (Hayden 1985; Rousseau and Friele 1986).

4.3.3 Okanagan-Colville

James Teit mentions the Okanagan-Colville in his monograph on the Shuswap (1909) but points out that he did not visit all groups in their territory. In 1909, based on further interviews, he modified his description of the Okanagan-Colville and incorporated this information into his overview of Salishan cultures (1930a). In general, Teit's writings on the Okanagan-Colville are superficial and inaccurate. Hill-Tout (1978a) also wrote on the Okanagan-Colville, but his work is mainly a recounting of stories and myths, and is weakened by his mistaken inclusion of a Shuswap group in his research. Dawson, a geologist, mentions the Okanagan-Colville in his 1892 publication on the Shuswap. Based partly on his own field data gathered in the early 1930's, Ray provides some information on the Okanagan-Colville in two works: an overview of Plateau cultures (1939) and a summary of Columbia Basin villages and groups (1936). Curtis also appears to have made his own brief study of the Okanagan-Colville prior to his 1911 publication on North American Indians.

Perhaps the most detailed and accurate account of an Okanagan-Colville group is provided in a series of articles by Cline and others (Spier 1938). Based on research in the 1930's they describe the activities and beliefs of the Sinkaietk, a group of Southern Okanagan located in northern Washington. **Lerman** undertook research among the Okanagan-Colville in 1952-1954, but did not publish his findings. Unpublished material from **Lerman** and others, as well as information from contemporary informants has been included in a number of works by Bouchard and Kennedy. These reports include a detailed and thorough account of the Lakes peoples (1985), research among the Okanagan-Colville in the Similkameen River-Palmer Lake Area (1984) in northern Washington, and between Merritt and Peachland (Kennedy and Bouchard 1987b). They also collaborated with Turner to produce a publication on Okanagan-Colville ethnobotany (Turner et al, 1980). Recent overviews are provided by Baker (1990) and Hudson (1990).

4.4 Basic Site Selection and Recognition

Certain criteria were very likely used by all Native groups to select a suitable place for a camp or village (see Appendix 1 for a definition of site types used in this discussion), including: (1) the presence of a dry, level camping ground, (2) the availability of trees for fuel, shelter and construction, (3) proximity to potable drinking water, (4) the abundance, variety, and accessibility of local food resources, and (5) access to trade and transportation routes (Tyhurst 1992:378-381). The location of resource procurement sites, that is, places where plants were gathered or fish and animals were caught, was determined almost exclusively by the accessibility and abundance of food resources near these places. Archaeological sites should be anticipated at any location in the Kamloops Forest District meeting these basic criteria.

Archaeological sites with the highest visibility are those with depressions resulting from structures that have been excavated into the ground. The largest such depressions would be the remains of pits dug for house construction. During the winter, most Shuswap, Thompson, and Okanagan-Colville people lived in circular (sometimes squarish), earth-covered, semi-subterranean pithouses (Teit 1895, 1909:492, 1900:192; Post and Commons 1938:40-l; Dawson 1892:79; Bouchard and Kennedy 1990:277). Pithouse size varied according to the number of people being housed, with estimates ranging from 15 to 100 people, or 1 to 20 nuclear families (Teit 1900:192; 1909:492; Nastich 1954:37; Hill-Tout 1978a:58; Post and Commons 1938: 40-l; Bouchard and Kennedy 1979:129; Smith 1900:406). The resulting depressions were typically 4 to 22 m in diameter and 1 to 2 m deep (Boas 1891:633; Ray 1939: 177; Kennedy and Bouchard 1987a:258; Surtees 1974; Ray 1939:177). A conical roof was usually supported by four main posts. Access was provided by a ladder placed in a square hole in the centre of the roof or in some cases by a side entrance at ground level. A large part of the interior was comprised of sleeping areas, and in some cases sleeping platforms 1.5 to 1.8 m wide and 30 to 45 cm high were built around the outer wall (Teit 1909:676; Bouchard and Kennedy 1977:64; Boas 1891:634). Smaller pithouses had a single central hearth, while larger pithouses had a separate hearth for each family (Laforet and York 1981: 120).

According to Native informants, the decision of where to build a village was determined by both environmental and social considerations. The most basic physical needs included a close source of potable drinking water and trees for construction and firewood (Walters 1938:87; Teit 1900: 192). With salmon playing such a crucial role in their survival, efforts were also made to locate the village close to the fishing stations (Teit 1900: 179). Archaeologists speculate that close proximity to the fishing station ensured that the salmon did not have to be carried too far (Blake 1974: 15) and that dried salmon stored near the river could be safeguarded. They may also have wanted to protect privately-owned stations from unauthorized use by others (Nastich 1954:35). Probably for similar reasons the villages were also located close to berrying and root-digging grounds (Smith 1899: 128).

It was also important to select a warm, southern exposure, a sheltered location that afforded protection from winter winds that were funnelled down river valleys, and a site that

contained, well-drained, sandy or gravelly soil that could be easily excavated by hand (Bouchard and Kennedy 1990:286; Dawson 1892:8; Teit 1900:192, 1909:492, 1895).

Defence may have been another consideration in deciding where to locate a village. Raiding was one means of acquiring food (especially salmon) when supplies were scarce, either by capturing the stored food itself or by claiming use of fishing stations and bunting areas (Nastich 1954:36-7; Teit 1906:237-8; Cannon 1992). Native groups attempted to minimize raids from neighbours by establishing friendships through trade and intermarriage (Nastich 1954:44-45), though, if they had a wealth of salmon, they were commonly on the receiving end of these attacks. The greater their wealth, the more likely it seems that they would choose a well-protected and secluded location, or at least a site where the inhabitants could not be easily surprised. This need for defence had to be weighed against the desire for trade. Surplus had little value for the owner unless part of it could be traded for luxury and prestige items. Trading requires that the trader be easily located by potential customers and the village be conspicuously placed. Defensive fortifications may have provided the necessary compromise between being easily located for trade, and being protected against enemy attacks (Nastich 1954:37; Teit 1909:538-9, 1900:266).

In some parts of the study area, the main salmon-bearing rivers are within steep canyons with little dry, level land available close to the river bank. In these localities, villages were established on well-developed river terraces. On terraces above the canyon, trees were scarce up to the treeline, except along the few tributary streams that also provided the only sources of fresh water. Good village locations were therefore limited to the lower reaches of these tributaries, with the largest villages typically found near the treeline. As an example, Thompson villages were typically five or seven kilometres apart on average, though the next village could be as many as sixteen kilometres away, or sometimes just across the river (Teit 1900:199). For most of the Thompson River valley, however, suitable locations were easily found along the river floodplains or lake shores. Consequently, village sites in these areas were less likely to occur on streams, were closer (horizontally and vertically) to the river or lake, and did not cluster as tightly as those in the steeper canyons (Blake 1974:2).

A few families probably also spent the winter in smaller rectangular or conical lodges with a pole framework covered in mats, bark, poles, branches or earth. These temporary matlodge structures were more commonly occupied in the spring and summer, when smaller family units dispersed to hunt and gather plants in the mountains and valleys, or in the fall when most people were fishing for salmon in the lakes and rivers. Only those matlodges used in the winter had an excavated foundation, which was only about 15 cm deep (Teit 1900:194-8; 1909:493-4; 1906:215). It is also occasionally possible to detect level platforms where the fair-weather structures were built.

Circular depression features also result from underground roasting ovens and storage pits used to cook and store dried food. These pits ranged in size from about 1 to 4 m across and 0.3 to 2 m deep (Alexander 1992b:126-32). Roasting pits were usually located away from dwellings, but close to water and near the root digging grounds. Cache pits were common at

the village and near the fishing stations and root digging grounds (Turner, Bouchard and Kennedy 1980: 11; Dawson 1892:9; Hill-Tout 1907:108).

Other structures that may be detected at archaeological sites are: (1) small dome-shaped sweat houses made of a bent sapling frame with a bough, bark or earth covering, (2) small conical puberty huts of fir branches, (3) menstrual huts built like a small shelters or pithouses, and (4) smudge pits, and frames used to smoke hides. All these structures are usually associated with small pit features which may be evident on the surface (Teit 1909:477, 495, 587, 1900: 186,198, 326, 312). Sites without such pit features (e.g., lithic scatters) are much more difficult to locate unless natural or human activities have removed some of the surface vegetation or subsurface testing is used during site survey.

4.5 Subsistence Strategies on the Interior Plateau

It is common to organize a discussion of ethnographic data according to ethnolinguistic group, but in the study area, differences in the subsistence and settlement practices of bands within the same group are often greater than those between bands from different groups. To clarify discussion, Native peoples in the study area were grouped into two divisions representing two major subsistence strategies.

4.51 River Division

The River Division includes those bands for whom salmon was the most abundant and sought after food resource. Salmon spawning rivers in their traditional territory had significant spawning runs every year. They could catch and dry enough salmon in one or two months to not only provide themselves with enough food to survive the next year, but to acquire a surplus that could then be traded with neighbouring bands.

This large dependable supply of salmon allowed these bands to become more sedentary than the Lakes Division bands, and to devote more energy to trade. This sedentary trend was most evident among the Canyon Shuswap, a subgroup outside the study area on the Fraser River. This group made a large profit acting as middlemen between the other Shuswap bands and the Chilcotin. "They gave all their energies to salmon-fishing, the preparation of oil, and trading, and did very little travelling and hunting. They were almost completely sedentary, most of them living summer and winter in the same locality" (Teit 1909:535). Groups in the study area would not have been as sedentary because the salmon runs on the Thompson River were smaller and less dependable (Teit 1900:230). For example, the Lower Thompson on the Fraser River were more sedentary than the Upper Thompson on the Thompson River who depended more heavily on hunting (Teit 1900:169, 230). On the other hand, groups living on the Thompson River with access to larger runs, would still have followed this general pattern with salmon comprising more than half their diet (Lovell et al, 1986:99).

Subgroups and bands in this division included eight Shuswap bands: Skeetchestn, Kamloops, Pavilion, Main Thompson, Lower Upper Thompson, South Thompson, Adams Lake, and Shuswap Lake Bands, and two Thompson subgroups: the Spences Bridge and Nicola Thompson.

4.5.2 Lakes Division

Salmon was an important food for the Lakes Division people, but the smaller and/or undependable salmon runs in their territory necessitated a greater dependence on other resources. For the Bonaparte and Canim Lake Shuswap Bands and the Northern Okanagan in the study area (with numerous large lakes in their respective territories), freshwater fishing dominated the subsistence economy, while the Upper North Thompson Shuswap were heavily dependent on hunting (Teit 1909:513, 517). Given the variety of options available to these peoples, and the greater dependence on dispersed resources, they were more nomadic and were less likely to revisit the same campsites every year than bands from the River Division. For example, Teit notes that the Upper North Thompson Shuswap were ‘almost completely nomadic Indians’ and definitely “the most nomadic” of all the Shuswap bands, while the Canim Lake Band Shuswap were “more migratory than bands belonging to the Fraser River” Shuswap (1909:454, 460, 513).

Lakes Division bands were also more likely to winter in matlodges. The Canim Lake Band did not build pithouses (Teit 1909:494), while most of the Green Timber Band “wintered in lodges, and underground houses were seldom seen” (Teit 1909:460). “A good number” of the Upper North Thompson Band also “wintered in lodges” (Teit 1909:460). With substantial and reliable salmon runs in the Thompson River, and with the technology needed to catch and store this food in large quantities, the River Division were able to be relatively sedentary and maintain a high population density. The Lakes Division lacked this abundant and reliable food source and were forced to live in smaller groups, moving frequently in pursuit of their more dispersed, and less predictable food resources. These small groups could rarely afford the time and energy to build a pithouse which they would only be able to occupy for a short period of time each year. Furthermore, it may have been necessary to abandon the house the following year if food resources in the locality fell below survival needs. This scenario may also be used to explain why some bands, who lived in a suitable climate but lacked rivers with reliable populations of spawning salmon, did not commonly build pithouses at contact.

Food shortages were a more common occurrence among these bands, since ungulates were dispersed and hard to catch in large numbers, while trout, suckers, and other resident freshwater fish had much smaller spawning runs than the salmon. To alleviate hunger in poor years, some members of these bands probably traded or lived among the River Division groups. Raiding was another means of attempting to resolve food shortages (Cannon 1992). Another option for some bands was to catch salmon in the territory of a neighbouring band with close kinship ties. For instance, the Bonaparte Shuswap fished with the Pavilion Shuswap at their Fraser River fishery and the Lake Shuswap fished with friends on the North Thompson or Fraser

Rivers (Teit 1909:524; Alexander 1992a: 164). Salmon was also the most important food resource for the Northern Okanagan, but very few salmon ascended the river above Okanagan Falls even prior to dam construction (Teit 1930a:198). Many people who lived upstream, including those in the study area, where salmon were absent, went to Okanagan Falls or further south to catch their salmon (Teit 1930a:247; Bouchard and Kennedy 1984:30). Stable-carbon isotopic analysis of adult burials indicates that the greater the distance from a major salmon run, the less important salmon was in the diet, with an individual from Kelowna showing only 19% marine proteins in the diet, while one from Peachland had 44%, and one from Penticton had 57% (Chisholm 1986: 124). In the study area estimates are generally between 45 and 55%. Unfortunately, comparable data is not available from the North Thompson River area (Love11 *et al*, 1986:100).

Bands in the Lakes Division include the Bonaparte, **Canim** Lake, Green Timber, and Upper North Thompson Bands of Shuswap (Teit 1909:513, 517) as well as the North Okanagan bands in the study area. If they did not have access to the salmon fishing stations on the Thompson River, the Nicola **Athapaskan** would also have followed the Lakes Division strategy. A strong possibility exists that some of the lakes and rivers used by the Lakes Division bands had much larger and more dependable salmon runs in the past than they do now (Kew 1992). Any bands with access to significant runs in their territory would probably have adopted subsistence and settlement patterns like those described for the River Division.

4.5.3 Effects of Subsistence Strategy on Village Size and Site Densities

The size of the villages, and the general densities of sites in a given area, are related to the subsistence strategy and the abundance of salmon. Lands occupied by bands with a River Division adaptation would be expected to have larger villages and higher overall site densities.

At contact, some Interior Plateau pithouses were built in isolation (Nastich 1954:25), while others clustered together in small villages with rarely more than 3 or 4 houses (Teit 1900:169, 192, 1909:460; Dawson 1892:8). One notable exception was the 9 to 11 large pithouses at Fountain, a Lillooet village on the Fraser River (Teit 1906: 199). Each band had a larger village which served as its principal headquarters, but many of its members lived in small villages scattered nearby. As Teit (1909:457) explains, these small villages were:

"... frequently changed, and even the **main** locality or village of a band could have more families one winter, and less another. Some families were more nomadic than others, and each band would have people from neighbouring villages living with them every winter."

Some Thompson families actually constructed several pithouses (Teit 1900: 175). Nevertheless, most natives in the study area were probably like the Southern Okanagan who "almost always wintered at the same site [and in the same pithouse], changing only if firewood became scarce or some catastrophe occurred" (Post 1938: 11).

In contrast the Lakes Division bands lived in smaller villages. For example, the Upper North Thompson Band “was numerous at one time, but had, it seems, no main village, the people wintering in groups of a few families along Upper North Thompson River, north from above Little Fort” (Teit 1909:460). On the other hand, the Lower North Thompson Band wintered in small groups of from one to four underground houses on both sides of North Thompson River (but principally on the east bank) from “Little Fort down to about 20 miles above Kamloops” (Teit 1909:461). The Main Thompson Band followed a similar pattern. These bands were also more likely to establish their village on a lake than a river, since the resident lake fish were more important in their diet.

It should be noted that the archaeological record shows that villages were much larger, on average, in the distant past. However, the contrast between the relative size of Lakes Division and River Division villages probably existed even in this earlier time period.

Higher population densities also suggest the possibility of higher densities of village sites, as well as other site types in lands occupied by River Division bands. The density of villages and other site types should be lowest on the North Thompson above Little Fort, where the Upper North Thompson lived. Relatively low densities may also be expected in the Bonaparte River drainage where the Canim Lake, Green Timber, and Bonaparte bands lived. Exceptions to the latter include the Arrowstone Hills and Upper Hat Creek Valley, areas with large quarry sites that attracted people from many hands. The Northern Okanagan are known to have occupied only a small part of the study area near Monte Hills, an area the Thompson and/or Kamloops Shuswap may also have claimed at some time in the past. Therefore, site densities in this area may not necessarily reflect use by a Lakes Division band.

4.6 Subsistence and Settlement Patterns

Shuswap, Thompson, and Okanagan-Colville subsistence was based on a combination of hunting, fishing, and gathering of food plants. In the winter months, they congregated in large multi-family winter houses. During warmer weather, families travelled throughout the band’s territory, dispersing and regrouping to make the most efficient use of the seasonally available resources. Much of the food was dried and stored for use during the winter months. This section of the report outlines the general pattern of aggregation and dispersal that these families followed throughout the year. Table 2 provides a monthly calendar of activities as described by the Shuswap and Thompson.

The ethnographic reconstruction of traditional Native land use practices in the study area and the derivative predictions for archaeological patterning presented below are described according to environmental units. This environmental classification scheme divides the study area into units based on ethnographic accounts of the abundance and seasonal exploitation of culturally important resources. The same strategy was used by Alexander in earlier studies of the Interior Plateau (Alexander 1992a, 1994; Bussey and Alexander 1993, 1994). The resulting scheme divides the study area into seven environmental units: (1) Alpine, (2) Montane Parkland,

(3) Montane Forests, (4) Intermediate Grasslands, (5) Intermediate Lakes, (6) River Terraces, and (7) River Valleys.

Appendices 2, 3, 4, and 5 provide lists of the mammals, birds, fish, and plants used by Natives in the study area and give their latin names.

4.6.1 Potential Variability in the Ethnographic Patterning

This ethnographic summary describes the land use pattern commonly followed by most people, but provides little information on how this pattern may have varied between families and from year to year. We know that factors such as “band location, individual need and interest, weather, interpersonal relations, and a variety of other things” (Lane 1981:406) could alter this pattern. However, these small scale fluctuations from the norm are unlikely to be visible in the archaeological record, which is relatively insensitive to short term changes or isolated events. Therefore detailed discussions of this variability are unnecessary in this context. Although the territorial boundaries of the bands and ethnolinguistic groups shifted with time, changes in subsistence patterns and technology in the late prehistoric period were probably minor. In band societies, the high rate of exchange and intermarriage between neighbours means that all bands in an area generally have access to the same information concerning technology and subsistence practices. This factor, together with the environmental similarities, undoubtedly explains the marked similarity in archaeological materials throughout the Interior Plateau. Therefore, any shifts in the territorial boundaries probably had only minor affects on local settlement and subsistence patterns.

This study uses historic and contemporary ethnographic data to reconstruct late prehistoric and proto-historic land use patterns. Obviously, this is not a straightforward task, given the many changes to native cultures over the last 150 years. Any reconstruction must take into account cultural changes in the population density, diet, technology, storage, and transportation. The distribution and abundance of resource species has also been altered to some extent by ranching, logging, and commercial fishing. Nevertheless, many traditional activities are still practised, or were practised until 50 or 60 years ago, within the living memory of contemporary Native elders (Turner 1992:408-11). Many of the traditional subsistence and settlement patterns, which are no longer remembered or practised, have been recorded in early ethnographic reports from the study area. By combining data from these early reports with more recent studies and environmental data, it is possible to reconstruct most prom-historic land use patterns with considerable confidence.

Table 2. Monthly Calendar.

Moon OR Month	Shuswap (Dawson 1892:40)	Shuswap On Fraser R. north of Pavilion (Teit 1909:517-18)	Thompson Spences Bridge group (Teit 1900:238)	Thompson & low Lytton (Teit 1900:238-9)
1 Nov.	Return from hunt	Deer rut Start to enter winter house	Deer rut People hunt	Deer rut
2 Dec.	Remain at home	First real cold	Weather gets cold Most people go into winter houses	People go into winter houses
3 Jan.	Midwinter	Sun turns	Bucks shed antlers, does get lean	Last people go into winter houses
4 Feb.		Frequent Chinook winds Snow begins to disappear	Chinook winds melt snow Plants sprout Many leave winter houses	Chinook winds Some camp in lodges for awhile
5 March	Spring	Snow leaves low ground Few spring roots dug Many leave winter houses at end of month	Grass grows People leave winter houses	Last cold People make short return to winter houses
6 April	Grass	Grass grows fast Snow leaves high ground Dig roots	Trees leaf Water increases Fish trout and trap lake fish	Winter houses left for good Catch fish in bag-nets
7 May	Root digging	Fish trout at lakes	Dig roots	Dig roots People go on short runs
8 June	Strawberry	Service-berries ripen	Service berries ripen Some people hunt	People start to fish salmon
9 July	Berry	Salmon arrive	All berries ripen Deer drop young	People pick berries
10 Aug.	Salmon	Fish salmon all month	Sockeye salmon run	People fish and cure salmon
11 Sept.	Salmon get bad	Cache fish Leave rivers to hunt	Coho salmon come Salmon begin to get poor	People prepare fish oil
12 Oct.	Deer travel	Hunt in mountains Trap game in mountains	Bucks begin to rut People trap and hunt	People hunt large game People go trapping

*The seasonal cycle of subsistence is reflected in the names and "principle characteristics" of the "moons" or months as described by Native informants. This table summarizes the main environmental cues and subsistence activities that were used to signify the moons.

4.6.2 Seasonal Round of Subsistence Activities

The following is a brief summary of the seasonal round of subsistence activities, aggregations, and dispersions followed by Native groups in the study area. This summary is based on information provided in Alexander (1992b), and is most applicable to groups living in the southern half of the study area. The timing of activities and the importance and availability of individual plant and animal species varies with latitude. Critical environmental factors that influenced traditional land use patterns include increasingly colder weather, heavier snow falls, and smaller and later salmon runs on a gradual *cline* from south to north. Consequently, the timing and duration of activities may vary slightly for groups living in the northern half of the study area.

The year began in November when most families moved back to their winter houses. While the houses were being prepared for the winter, men hunted and fished at lower elevations. December, January, and February were largely spent indoors living on stored foods, primarily salmon. To supplement the dried foods, men continued to hunt deer and other animals at lower elevations. Ice fishing for trout and other fresh water fish was also undertaken at the lakes, weather permitting. Late February and early March was a critical period of the year when stored food may have become low or exhausted. Game was poor and hard to catch, and the plants were not yet ready to harvest.

By late March the weather had usually warmed to the point where most families had moved out of their winter houses and into summer dwelling lodges. In late March and April, families dispersed throughout the area to gather plants and hunt at lower elevations. A few individuals, then and throughout the summer, would also catch fish in the rivers and lakes.

In mid-May some families moved to trout fishing stations by the lakes to take advantage of the spawning season, while others moved to higher elevations. At the fishing stations, families caught and dried large quantities of trout and also took a few deer. Plants and migrating waterfowl were also acquired when available. Families scattered in the highlands concentrated on collecting roots and hunting for deer. In late May some families may also have travelled outside the study area to catch trout at Green Lake, or gather roots in the **Botanie** Valley. Montane hunting and plant gathering by isolated families, or same-sex task groups, continued sporadically throughout the summer.

In June and July, most women collected large quantities of berries, especially **saskatoons**. Berries were most abundant beside the rivers and lakes, and others could be collected slightly later in the highlands. These activities were usually based at the winter village. Fishing for spring salmon was also a popular activity at this time of year.

From mid-July to mid-August the majority of people lived at the salmon fishing stations. Trading with people from other bands and ethno-linguistic groups was common at these sites in August and September. Immediately following the salmon fishing, most families gathered at the high elevation parkland basecamps. Deer hunting was the primary activity at these sites, though

some plants were also collected. These gatherings were important social events, with games and gambling being common activities.

Between September and November, the men spent much of their time hunting, following the deer as they migrated from the parkland to the lower elevations. In the pre-contact period, women may have travelled with men, or they may have stayed in the winter **basecamp** to exploit plant foods. Late runs of salmon in October and November were also exploited by some families.

4.7 Description and Use of Environmental Units in the Study Area

4.7.1 River Valleys

The River Valleys environmental unit consists of a narrow stretch of land along the banks of the salmon-bearing rivers and the shores of the adjoining lakes. By definition, the unit is restricted to lands less than 500 m from the river bank or lake shore and 60 m above the river or lake.

In the southern half of the study area, the River Valley is in the Bunchgrass and Ponderosa Pine biogeoclimatic zones. These zones are the driest in the province and record the hottest summer temperatures. The mean monthly temperature is below freezing only 2 to 4 months of the year (Beil *et al.*, 197654). Ponderosa pine is the dominant tree species. Open, parkland stands of ponderosa pine are found on the lower slopes and drier valley bottoms. Wetter and more shaded locations, at the edge of streams and rivers, may also contain Douglas-fir, cottonwood, aspen, and birch. On finer soils, trees are often absent, and the predominant vegetation consists of bluebunch wheat grass, and, in more heavily grazed areas, sagebrush (Beil *et al.*, 197654).

This dry zone does not support significant numbers of deer, primarily because of the thin vegetative cover, though there is limited winter, spring, and early summer use of the area. Wild grasses were more abundant in the area prior to heavy grazing pressure on the lands by cattle and horses since the late 1800's (Tisdale 1947; Brayshaw 1970, Anderson 1973). Consequently, deer and perhaps elk and sheep may have been more seasonally plentiful at lower elevations in the past. Elk were definitely more plentiful in the Nicola Valley and Kamloops Lake areas before contact (Kennedy and Bouchard 1987b: 127-9; Teit 199514).

Given the hot, dry climate of this zone and the scarcity of streams and springs, beaver are rare, but bears, snowshoe hare, yellow-bellied marmot, and squirrels are common. Large and small animals were most commonly hunted with a bow and arrow, but spears, slings, and clubs were also occasionally used. Traps and deadfalls were constructed for both large and small game, while fences and corrals were used to catch ungulates, often in conjunction with drives. Dogs were used extensively in the hunts (Teit 1930:240-47).

A few of the creeks in the zone can support fish. Large beds of mussels were found in some localities and were commonly eaten when other foods were scarce in the winter (Bouchard and Kennedy 1984:33). Many ducks, geese and other waterfowl would have been available on the lakes especially when flocks were migrating in the spring and fall, while grouse were available in all seasons.

For the most part, the River Valley in this section of the study area is covered with grasses and sagebrush. This environment supports few food plants except for Mariposa lily, cactus, and desert parsley. However, a variety of food plants are available at the edge of the forests and in stream valleys that dissect the terraces, with balsamroot and saskatoon being the most important. Many of the shoots, roots, and leaves collected from the River Valley are available in the spring between March and May. During the summer (June-August) most of the berries ripen, and in October the mushrooms are ready for harvesting.

The River Valley in other portions of the study area is moister and forested. In the north-central portion of the study area, upstream from Chase and Heffley Creek, the River Valley is in the Interior Douglas Fir Zone (IDF). This zone is warm and dry, with the mean monthly temperature below freezing 3 to 5 months of the year (Beil *et al.*, 1976:53). Douglas fir is the dominant climax species. Other common tree species in the IDF zone include lodgepole pine, ponderosa pine, western white pine, and grand fir. In wetter areas, the following deciduous species are common: aspen, cottonwood, Douglas maple, paper birch and scrub birch (Mitchell and Green 1981). Western red cedar and rocky mountain juniper, important tree species traditionally used in native technology, are found in low frequencies at lower elevations.

In the extreme northern portion of the study area, north of Adams Lake and upstream from Vavenby, the River Valley is in the Interior Western Hemlock Zone (IWH). This zone is the wettest in the interior of the province, but temperatures are generally similar to the IDF. Common tree species include western hemlock, Douglas fir, western larch, western red cedar, western white fir, aspen, cottonwood, and paper birch (Beil *et al.*, 1976:53).

These wetter River Valleys represent some of the best wintering grounds for elk, sheep, and deer. Although the occasional moose is found in the study area, they were absent from the Southern Interior prior to 1900 (Spaulding 1990:7) and are not part of the traditional economy. The wetter conditions also make these areas more productive for aquatic fur-bearers and waterfowl than the southern portions of the River Valley unit. Some important wetland food species are abundant in these localities, such as cottonwood mushrooms, water parsnip, silverweed, and gooseberries. Cattails, tule, reed canary grass, and willows, important in the construction of tools and shelters, are also abundant in this environment. The drier and more open areas were important locations for collecting soapberry, saskatoon, nodding onion, balsamroot, blackcap, and Oregon-grape, with the berries being especially abundant in old burns. Many of the shoots and roots of food plants would have been available for harvest between March and May, most berries between June and July, the cattails and tule in August, and mushrooms in October.

Salmon was the most important and abundant food resource in the study area and was found exclusively in the River Valley environmental unit. July was the warmest month for the River Division and the month when the largest salmon runs began. For these bands, late July and early August were devoted almost entirely to catching and drying salmon, primarily sockeye. The August run spawned in Adams Lake and the Upper Adams River (Bouchard and Kennedy 1990:251-2). Coho and steelhead also ran at this time, but were rarely caught, presumably because of their low numbers, while pinks occurred in low numbers below Kamloops Lake. Spring salmon ran in deeper water than sockeye, beginning in mid-July and, occurring further from the shore, were infrequently caught (Bouchard and Kennedy 1990:250-1). Campsites were occupied at fishing stations for as long as the runs were good or for as long as it took to catch and dry enough fish for winter. Conditions for drying salmon were excellent in the River Valley where the hot dry weather and strong winds quickly dried the salmon without supplementary smoking. The September salmon runs were usually poor, and families generally moved away from the fishing basecamps in August, after preparing salmon oil and storing dried salmon in elevated caches and cache pits near the fishing stations. A large sockeye run also occurred during the first two weeks of October (Bouchard and Kennedy 1990:251). The Lakes Division bands, who did not always have access to the large salmon runs, often focused on hunting and catching lake fish during these months.

Social activities such as visiting, dancing, gambling, and marriage alliances took place at the fishing camps, since everyone was gathered in one place and food was abundant. Trading was also common, especially at the large, important fishing sites (Alexander 1992b: 161).

Dip nets and set nets were the most effective means of catching salmon, and the best netting locations were along narrow stretches of the river with bedrock outcrops. The steep river banks at these localities induced the fish to travel closer to the bank where they were more easily caught, while associated backeddies encouraged the fish to rest and congregate in large numbers. The turbulent water also prevented the fish from seeing the nets. Salmon congregated in large number at the inlets to the lakes, and consequently, narrow and rapid stretches of rivers and lake inlets are the most likely locations to find prehistoric salmon fishing sites. In general, the North Thompson River drainage was less productive than the South Thompson, with the section above Little Fort being particularly poor in salmon.

Large numbers of spawning freshwater fish were also caught at the mouth of inlet and outlet streams leading into the lake, and along the lakes shores. Species that were commonly caught by Native groups on the Interior Plateau, spawning in this area during May and June and include: trout (steelhead), sucker (largescale, bridgelip, northern mountain), peamouth chub, northern squawfish, and prickly sculpin. Species spawning at other times include: burbot (February), white sturgeon, and mountain whitefish (mid-November) (Carl *et al*, 1959; Alexander 1992a:90). Although the most intensive freshwater fishing would have occurred during spawning runs, lake fishing occurred all year round (Teit 1930a:213). Many Interior Plateau peoples focused their efforts on catching rainbow trout or steelhead (Teit 1900:250, 252; 1909:526, 517-8; Smith 1900:406; Lane 1981:406). For example, in late April, many of the

people from the Spences Bridge Division caught spawning steelhead at the mouth of the Nicola River, where “a hundred tents or more” were set up (Teit 1900:251-2).

Where the river was muddy or rough, dip nets were *used* to catch salmon. The Natives also used nets with floats and sinkers in the lakes, single and double pointed spears with detachable heads, from the shore and in shallows, two or three-pronged spears to catch small and large fish from canoes, the ice, and from rocks overlooking the water. They used spears by torchlight on lakes and some rivers, hooks and lines to catch small fish, weirs and traps in shallow streams and at the outlets and inlets of lakes, and spears and bone gaff hooks to catch salmon trapped below the weirs and in shallow water (Teit 1930a:246-7, 1909:525-30, 1900:249-54; Kennedy and Bouchard 1992). Wooden platforms were sometimes built over the water to aid in the harpooning and netting of fish from the steep river banks (Kennedy and Bouchard 1992).

The two most common types of sites that are expected to occur in the River Valley zone are: fishing basecamps and hunting and/or butchering sites. Given the long-term and continued reuse of the few available fishing sites, high artifact densities should be expected. Moreover, there should be evidence of cache pits and elevated caches for salmon storage, roasting pits and hearths for cooking, and fish drying racks. Exotic artifacts should also occur at the fishing sites, especially the larger sites where trading was more prevalent. Evidence of small dwelling lodges may be expected, as well as large, square or rectangular lodges at the larger sites. In a few places, suitable village sites occurred at the edge of the river or lake, this could result in sites that are both villages and salmon fishing basecamps.

Artifacts from the hunting activities would be thinly scattered throughout the River Valley. Small kill and/or butchering sites with low artifact densities should be most common. However, camps located near important trails leading from the Terraces to River Valley might have been regularly reused and therefore contain higher artifact densities.

4.7.2 River Terraces

The River Terraces unit includes all terraces along rivers and lakes containing spawning salmon that are less than 3 km from the river bank or lake shore and more than 60 m above the river or lake. Many of the terraces in the southern portion of the study area are gently sloping, long, broad, and well-defined. Further to the north, the valley sides are steeper and the terraces narrower and more poorly defined. The River Terraces unit is in the same biogeoclimatic zones as adjacent portions of the River Valleys unit and thus, the climate, and plant and animal populations are the same.

November, which typically brought the first snows, was the month when most Shuswap people moved back into their winter dwellings (Table 2). These wintering sites were most commonly located on the River Terraces, though a few also occurred in the River Valley, and

around the Intermediate Lakes. A discussion of preferred location for a winter village is discussed in Section 4.4.

Winter villages would be the largest and most conspicuous sites on the River Terraces. Most hunting and plant gathering activities in this environment were staged from the village, so few if any basecamps are to be expected. Most resource procurement sites would have been used by same-sex task groups rather than family groups, and rarely occupied for more than one day. Plant gathering sites have low archaeological visibility. Although roasting pits and plant storage pits are not expected at the procurement sites, cache pits for storing dried salmon may be expected along the edge of the lowest terrace close to the fishing stations.

Hunting activities are likely to have produced a number of different types of archaeological sites including game lookouts, and kill and/or butchering sites. Most of these sites should be small, with low densities of artifacts, but localities where ungulates were frequently encountered may contain higher densities due to reuse of the site from year to year.

Village sites should be found along the Thompson River at intervals of between two and sixteen kilometres, with isolated houses scattered between the main villages. Pithouses should be the most common dwellings at the villages but above-ground lodges designed for winter or summer use may also occur. A few large, square lodges may also have been built for special occasions when large groups of people gathered. Sweathouses, women's seclusion lodges, drying racks, elevated storage boxes, storage pits, and smudge pits should be common, although not all would be easily recognized in an archaeological context. Given the wide range of activities that took place at the winter village, the long occupation, and the storage of resources from many environments, these sites should contain the most diverse tool and faunal assemblages of any site types.

4.7.3 Intermediate Lakes

The Intermediate Lakes environmental unit includes land adjacent to all the mid-altitude (less than 1500 m or 5000 ft) lakes and the adjacent reaches of their outlet and inlet streams, excluding those lakes with major salmon runs. These lands include some of the more open portions of the IDF and IWH zones.

The water levels in the lakes and rivers fluctuate both seasonally and yearly with the highest levels occurring during the spring run-off, generally in May or June. The magnitude of this spring freshet is dependent on the size of the winter snow pack at higher elevations. Yearly and long range oscillations in precipitation result in variations in the depth of the snow pack. Cool winters and warm, dry summers are typical in this environment, with temperature and precipitation figures similar to those of the Intermediate Grasslands and lower Montane Forests.

A few winter villages were probably located in this environment. During milder weather, the winter dwelling was used as a **basecamp** from which the men could go ice fishing on the lakes. Trout, sucker, and whitefish were the most common catch. Ice fishing was probably best in early December and March when the ice was not as thick. Historic accounts describe winter fishing by single men during day trips from winter villages. Women also used a hook and line to ice fish, sometimes building a small fir bough shelter for themselves over the hole (Kennedy and Bouchard 1992).

Day trips were also made to hunt deer (and other ungulates) in their wintering places around the Intermediate Lakes. Historically, men commonly conducted these hunts individually in December (Alexander 1992b: 156). Traditionally, hunters used dogs and snowshoes in these pursuits (Teit 1900:248). Small mammals and grouse were available near the lakes all year and were probably hunted on a casual basis, while individuals were present in the area to obtain other resources. Bears, snowshoe hare, yellow-bellied marmot, ground squirrels, porcupine, and squirrels are generally numerous in the drier environments, while species preferring a wetland habitat, such as beaver, mink, and muskrat, are also common. The best hunting season for these animals would have been in the late fall and winter. Deer, elk and sheep are abundant in many Intermediate **Lake** localities, especially in the spring, late fall and winter.

In mid-May some families fished rainbow trout, whitefish, and sucker at fishing stations by the lakes, to take advantage of the spawning season (Alexander 1992b: 151). These **fish** were common all year, but the largest quantities were caught in spring, as they spawned in small streams leading into and out of the lakes. Some Shuswap families also probably travelled to Green Lake in Lakes Division territory, where people from many different Shuswap bands gathered every spring. The Shuswap, Thompson, and **Okanagan-Colville** also gathered in groups of up to 1,000 at Chapperon Lake, south of the study area (Kennedy and Bouchard 1987b: 132). Kokanee were also caught in some lakes in the fall.

Wetland birds are more numerous here than anywhere else in the study area and were probably hunted most frequently in the spring and fall during migration.

The Intermediate Lakes unit provides the best wetland environment in the study area. Some important wetland plant food species would be most abundant in these localities, such as cottonwood mushrooms, water parsnip, silverweed, and gooseberries. Cattails, tule, reed canary grass, and willows, important in the construction of tools and shelters, were also most abundant in this environment. Drier and more open slopes above the lakes were important locations for collecting soapberry, saskatoon, nodding onion, balsamroot, **blackcap** raspberry, and Oregon-grape; the berries being especially abundant in old bums. Many of the shoots and roots of food plants would have been available for harvest between March and May, the berries between June and July, the cattails and tule in August, and mushrooms in October.

The largest and most conspicuous sites in this environment should be winter villages sites. Also highly visible would be the spring basecamps associated with trout fishing, and, to a lesser degree, hunting and plant gathering. These sites should be located on the banks of

streams near the inlets and outlets of the lakes. Structural features at the fishing camps would include hearths, fish drying racks, weirs, temporary shelters, sweathouses, and women's seclusion lodges. Dwelling lodges may also have been constructed at the sites, since the sites were used for a relatively long period of time each year, and the weather could often be inclement. Meat drying racks, hide stretching frames, and smudge pits may also have been constructed to process deer. However, these features should be uncommon since deer do not seem to have been caught in large numbers at this time of year, and their hides were not in prime condition. Cache pits for temporary storage of fish, and plant foods, may have been located near the basecamps.

The basecamps may also have been briefly occupied in other seasons while hunting, fishing, or gathering plants, though other small camps may have been established on the lake shore for these activities. These smaller camps were probably not occupied for more than a few days and, in many cases, may have only been used during the day for trips originating from the winter village. Few features, other than hearths and postholes from temporary shelters, should be expected from these occupations. Some of the cultural debris from ice fishing would probably have ended up in the lake since much of the cultural activity took place on the ice: Game lookout sites may be expected on the slopes overlooking the valley, and isolated ungulate kill and/or butchering sites can be expected throughout the valleys. Hunting activities in the fall and winter may also have produced small camps used by one to three men, with higher densities of artifacts near more frequently-used kill sites.

4.7.4 Intermediate Grasslands

The Intermediate Grasslands unit is found within the IDF and IWH zones at elevations between 1000 and 1400 m. It consists of open grasslands which are now used primarily for pasture or the growing of hay. The terrain is generally flat or gently sloping towards the stream valleys, with steep rolling slopes at higher elevations. These localities were mostly open grasslands prior to the introduction of farming and ranching in the area. Since then the open land has increased and new species of grasses have been introduced by Euro-Canadians (Mathewes 1978:77). Streams are typically enclosed by deciduous or mixed forests with dense underbrush. In general, the winters are cool and snowy and the summers warm and dry, with temperature and precipitation levels equivalent to those found at the lower elevations in the **Montane** Forest unit. This environment is relatively rare in the study area. Notable exceptions include the Hat Creek and Cold Creek Valleys. Most other Grassland localities are also located in the southern portion of the study area.

Given the weak ethnographic data on seasonal use of the Intermediate Grasslands, the reconstruction of prehistoric land use is not as detailed as for other environments. In the early spring (April-May), when deer, balsamroot, and spring beauty were abundant, the Intermediate Grasslands may have been a selected destination, with small family groups establishing basecamps for a few days to a week. These environments were also good wetland habitats for waterfowl that would have been most abundant in the spring and fall. Since the Intermediate

Grasslands were generally not far from the winter villages, women could have collected berries during day trips to the area in June and July, and men could have hunted deer during the winter. Late fall basecamps may also have occurred there, as the hunters followed the deer down out of the mountains. Since some of the major trails cut through the grasslands, it seems likely that short term transit camps (1 to 3 days occupation) were made by families, and same-sex hunting and gathering groups. These short term camps would have been occupied between mid-May and November.

The short term transit camps should contain evidence of basic camp activities such as cooking and the construction of temporary shelters. Basecamps used in the spring and fall to collect plants and hunt deer and waterfowl, may contain evidence of roasting pits, storage pits, storage platforms, and hide-smoking pits. Given the short occupations and close proximity to winter villages, where unprocessed resources could also be stored, these features are not expected to be abundant. Sweathouses and women's seclusion lodges may also have been constructed at these camps. Artifact assemblages should include tools used in cooking, construction, plant and animal procurement, plant processing, hide preparation, and meat drying. In general, the Intermediate Grasslands are expected to contain mainly small sites with few features, though occasional larger sites may occur in preferred camping locations as a result of frequent reuse by small groups. Site densities can vary from low to high. Higher site densities can be expected at localities with larger areas of grassland, more numerous suitable campsites, larger and more reliable populations of ungulates, more abundant food plants, and on more frequently used transit routes. Grassland localities may also have been used more intensively in band territories that contain few Montane Parkland localities, with the spring and fall hunts focused on the Intermediate Grasslands rather than the Montane **Parkland**.

The Intermediate Grasslands may have been used by a few families as a wintering place, but given the long hauling distance from salmon fishing stations, it is unlikely that major villages were located in this environment.

4.7.5. Montane Forest

The Montane Forest unit includes most of the continuous canopy forests in the following zones: Engelmann Spruce-Subalpine Fir (ESSF), IDF, and **IWH** (Annas and Coupe 1979). The Montane Forests are located below the Montane Parkland at elevations ranging from approximately 2000 to 600 m. Lands covered by these forests, but excluded from this unit, include areas at the edge of the Montane Parkland, and lands along lakes and rivers included in the Intermediate Lakes, River Terraces and River Valleys units. More than half of the study area is covered by Montane Forests.

The highest elevations in the Montane Forest Unit are within the ESSF zone. The most frequently occurring tree species in this zone are subalpine fir, Engelmann spruce, and lodgepole pine, with whitebark pine occurring on sunny, dry slopes. The lowest and driest portion of the Montane Forest unit is found in the IDF zone, where Douglas-fir is the dominant climax species.

The generally well-developed herb layer of the **ESSF** and IDF zones is dominated by pinegrass, with bunchgrass more common at lower elevation. The more productive the herb and shrub layers, the more ungulates the habitat can support.

The Montane Forests are warmer and drier than the Montane Parkland unit. The environment is present through a 1400 m range of elevation, so great variability in temperature and precipitation are characteristic of the Montane Forests. In general, precipitation decreases and temperature increases as the elevation drops, resulting in less snow and a longer growing season. The mean monthly temperature is below freezing for as much as 6 months at higher elevations, and as little as 2 months at lower elevations (Beil et al, 1976:51-53). The summers are generally warm and dry.

Mammal species not commonly found in the Montane Forests include mountain goat, caribou, and hoary marmot, all of which are restricted to more open and mountainous areas. The abundance of any particular species varies according to local habitat and season. The highest frequencies of squirrels, porcupine, wolverine, and marten in the Montane Forests can be expected in the more heavily forested sections, with mink, beaver and muskrat concentrated in wetlands. The highest frequencies of snowshoe hare, woodchuck, yellow-bellied marmot, ground squirrels, deer, sheep, bear, elk, and the remaining **furbearers** are found at the forest margins. The deer, sheep, bear, and elk congregate at higher elevations in summer, and lower elevations in the winter.

The Montane Forest unit is generally unsuitable for wetland birds due to the scarcity of wetland habitats. Ruffed grouse are common in all seasons and at all elevations, while spruce grouse may be found occasionally at higher elevations, and blue grouse only in spring, summer, and fall (Mathewes 1978:90-91). Grouse prefer forest margins and are rare in closed canopy forests. None of the lakes or streams in the Montane Forests contain shellfish, and few are likely to have fish.

Some of the most important food plants found in the Montane Forests are black lichen and the cambium (inner) bark of lodgepole pine. The more open forests and forest edges contain a wide variety of plants, with several types of berries, including soapberry, wild strawberry, **blackcap** raspberry, and white-stemmed gooseberry. Higher elevations also have black huckleberry, oval-leaved blueberry, wild raspberry, and thimbleberry, while Oregon-grape, choke cherry, and **saskatoon** are found at lower elevations. Other important food plants found in the Montane Forests include tiger lily, false Solomon's seal, cow-parsnip, Indian celery, and fireweed. Wild onions are abundant in the open forests. Many of the shoots and roots of the above listed plants were harvested between late March and June, while most berries were ripe between June and August (Alexander 1992a: Tables 2 and 3).

Ethnographic accounts of traditional Native use of the Montane Forests environmental unit are few and very sketchy. Forested valleys are described primarily as corridors to the rich Alpine and Montane Parkland environments, with a few campsites located in clearings along the transit routes (Alexander 1992b:145). Presumably, the relatively low resource frequencies

discouraged anything but casual use of the Forests. Not surprisingly, the most frequented portions of the Forests appear to have been open woods near forest margins and open areas along streams and trails where the variety and abundance of plant and animal species was greatest.

Between late April and mid-May, the mid-elevation Forests, primarily the more open areas, were exploited for plant resources such as lodgepole pine cambium bark, black lichen, Indian celery leaves, cow-parsnip stems, nodding onion, balsamroot shoots and roots, **fireweed** shoots, and false Solomon's-seal. A variety of berry plants could also be harvested in this area between mid-June and mid-August, though they were usually more abundant in other environments. The high elevation Forests were exploited for the same resources, as well as tiger lily bulbs and whitebark pine seeds (Alexander 1992a:Tables 2 and 3).

In addition to providing fuel and shelter, the trees were used for construction and the manufacture of tools. Lodgepole pine was commonly used to construct houses, fishing weirs, drying racks, and spear handles (Tyhurst n.d.: 17; Goldman 1953:43). Baskets and trays were made from the bark of birch, spruce, and cedar (Teit 1909:476-501, 764, 776), while in late May and June, women gathered spruce roots for basketry in the high-elevation **Montane** Forests (Turner 1992). Spruce bark canoes and cottonwood or cedar dugout canoes were common (Teit 1909:782, 531, Dawson 1892:14). Small items like combs, gambling sticks, and pipe stems were often formed from juniper or maple (Teit 1909:272-3, 512, 778, 1900:300-1, 1906:250, 221). Douglas fir spear and fish net handles, saskatoon digging sticks and arrows, and juniper bows were used frequently (Teit 1900:252, 1909:514-9, 782, Dawson 1892: 17). In the spring, the sap and inner tree bark of hemlock, lodgepole pine and **ponderosa** pine were also eaten (A. Eldridge 1982).

The majority of sites in the Forests are expected to be resource procurement sites used by task groups based in other environments. The lowland Forest resources were probably most commonly exploited from the winter villages, mid-elevation Forests from **basecamps** at the Lakes or in the Grasslands, and high elevation Forests from the Parkland **basecamps**. A few small basecamps might have existed in clearings in the higher elevation Forests, where groups of men, with or without their families, camped while hunting deer in the fall. Transit camps used by many different groups, varying in size and composition, were located in the Forests along the routes to the **montane** and other environments.

Since most sites in the Forests were probably used only by small task groups during day trips from a basecamp, features should be limited to hearths and the insubstantial remains of temporary shelters. Associated artifacts should reflect hunting and plant gathering activities, while tools and features from food processing should be absent. In a few sites, along frequently used trails, artifact densities could be moderately high, since the sites were reused every year by many different groups. Deer fences could also have been located in some Forested areas. The kill and/or butchering sites associated with such sites would have higher artifact densities. These localities and other important hunting sites may also be expected to contain the remains of dwelling lodges, smudge pits, meat drying racks, and elevated caches. Small scattered kill

and butchering sites, with few artifacts and low visibility, are expected throughout the area. Look-out sites would probably be rare given the general lack of good overviews in this forested environment

4.7.6. Montane Parkland

The **Montane** Parkland unit is equivalent to the Sub-Alpine Parkland **subzone** of the **Engelmann** Spruce-Subalpine Fir zone (Mitchell and Green 1981). This transitional **subzone** between alpine meadows and the subalpine forests is characterized by a mosaic of parkland meadows, krummholz tree clumps, and very open stands of subalpine tree species. Tree species found in this unit include whitebark pine, Engelmann spruce, subalpine **fir**, and lodgepole pine. The climate of this unit is characterized by severe winters, heavy snowfalls, and generally warm but unpredictable weather during the summer. Elevations in the Parkland range from about 1500 to 2100 m (5,000 to 7,000 feet). For the purpose of this study, the Montane Parkland includes all open meadows within 200 m of the **treeline** and forested areas within 50 m of the **treeline**.

Mammals historically present in the Montane Parkland of the study area, and used by the Shuswap, Thompson, and Okanagan-Colville, included: deer, grizzly bear, black bear, snowshoe hare, porcupine, yellow-bellied marmot, red squirrel, and northern flying squirrel which were hunted for food and skins. Cougar, lynx, bobcat, wolf, coyote, red fox, wolverine, long-tailed weasel, marten, mink, fisher, and short-tailed weasel were captured solely for their pelts (Cowan and Guiguet 1975; Teit 1906:225-7, 1909:649). The Montane Parkland is especially important as summer range for deer that typically use the fringes of open grassy areas, particularly those that offer nearby escape terrain in the form of bluffs and broken slopes. Food species such as bighorn sheep, elk, caribou, and mountain goat, may once have been present in low numbers throughout suitable environments in the study area (Alexander 1992a:53-76). Today mountain goat and caribou are largely confined to the mountainous northeast corner of the study area, while sheep and elk are concentrated in the Adams Lake area.

Although mountain goats and most of the smaller animals, winter in the Montane Parkland, the following mammals move to lower elevations to avoid the winter snows: deer, bighorn sheep, elk, black bear, grizzly bear, wolf, coyote, wolverine, cougar, bobcat, lynx, and marten. The most abundant food species were probably deer, snowshoe hare, and squirrels.

None of the lakes or streams in the local Montane Parkland can support fish or shellfish populations, or more than the occasional **wetland** bird (Alexander 1992a:78). **Ruffed** grouse are common in the unit year round, blue grouse are present in the winter, and spruce grouse are present all year but are scarce (Mathewes 1978:90-91; Robbins et al, 1966:84).

The most important food plants found in the open meadows of this environment are spring beauty corms, avalanche lily bulbs, dwarf mountain blueberries, tiger lily bulbs, nodding onion, balsamroot shoots and roots, cow-parsnip stems, and Indian celery leaves. Other important food plants are found in the open forests at the edge of the meadows, including

whitebark pine nutlets, soapberries, huckleberries, and a variety of other plants with berries. Most bulbs and shoots are suitable for harvesting between late April and mid-June, the lilies and berries between early June and late August, and pine nutlets between early September and mid-October (Alexander 1992a: Tables 2 and 3).

Each Montane Parkland locality in the study area is unique in terms of the quantity and variety of plant and animal species present. In the southern half of the study area, Parkland localities are generally small and widely scattered, while in the more rugged north, they are more common and more extensive. Bands with poor access to Montane Parkland localities sometimes opted to hunt around the Intermediate Lakes where they could also fish. For example, Shuswap people from the Kamloops area conducted their summer and fall hunts in the south, around Salmon, Chapperon, Stump, and Douglas Lakes (Teit 1930:214).

Until recently, very little was known about traditional native use of montane. The inaccessibility of mountain top environments has prevented most ethnographers from actually visiting these locations. In addition, many of the ethnographers working in the area have focused on analysis of the crucial salmon fisheries along the Fraser and Thompson rivers, and have, therefore, underemphasized or overlooked the significance of hunting and plant gathering in the mountains. Most of the available information on the use of montane resources comes from recent studies by Alexander and other authors (Alexander et al, 1985; Alexander 1992b, Tyhurst 1992; Turner 1992; Romanoff 1992). These studies have shown that montane environments were an important element in the seasonal round of subsistence activities for the Shuswap, Thompson, and Okanagan-Colville. Salmon was the major source of protein and calories, but when salmon runs were unproductive, the Indians were more dependent upon the deer, roots, and berries found in the mountains.

The Montane Parkland was an important and heavily used environment. Small family groups would travel to the mountains in May and June and establish basecamps in the Parkland. Day trips were then made from these basecamps to hunt ungulates, primarily deer, and to gather important food plants such as spring beauty and avalanche lily. These trips would last anywhere from several days to two weeks (Alexander 1992b:101). In September, after the main salmon fishing season ended, most families would return to the mountains to hunt and gather plants. These gatherings at the Parkland basecamps were important social events, with games and gambling being common activities (Turner 1992:418-9; Tyhurst 1992:383).

Later in the season, men continued to spend much of their time hunting, following the deer as they migrated from the Montane Parkland to lower elevations. The intensity and duration of any fall hunt was probably dependent on the number of salmon caught prior to the hunt, that is, fewer salmon meant a greater need for deer. The game began to move down to lower elevations by October, but hunting continued until early November when the mountains were abandoned due to cold and stormy weather. Historically, these hunts were generally undertaken by individual men or small groups of up to 10 men (Alexander 1992b: 118; Romanoff n.d.:40), and could last anywhere from a few days to several months (Romanoff 1992). Women probably more commonly accompanied these fall hunts in the past, when hide preparation and

plant collection were more important to the economy. Some women may have stayed in the winter villages to exploit plant foods at lower elevations.

Trapping increased after the introduction of the fur trade, making it difficult to ascertain the importance of small mammals in the prehistoric economy. However, all the ethnographic evidence seems to suggest that small mammals rank far below the importance of salmon and ungulates in the traditional diet. Since the pelts of these animals were in their prime in the fall, it is assumed that any trapping in the **Parkland** would have occurred between early September and early November.

Ungulates were commonly killed with bows and arrows; dogs were sometimes used to run the animals down. Lone hunters could ambush deer at salt licks, at drinking holes, or on rocky promontories where they go to escape the flies and mosquitoes. Animals were, however, killed wherever they were encountered, and consequently, kill sites could occur almost anywhere. Hunting parties of up to 10 men worked co-operatively to drive ungulates (primarily deer and sheep) up or down forested valleys where they were shot by one or two hunters hidden in a natural depression or behind a man-made blind (commonly constructed of piled rocks). These blinds should be expected at high points overlooking game trails. Animals killed at these locations were usually butchered somewhere else since the scent of blood would scare away animals in future hunts (Alexander 1992b:108-13).

Deer fences were also constructed in the **Montane** Parkland, but were more commonly used in the fall than in the spring. These fences were typically built in small valleys or in defiles where deer commonly crossed from one mountain to another or passed on their way down to their wintering grounds. Constructed of poles, limbs, and trees, the fences could exceed 800 m in length. The deer were caught in snares set at openings in the fence (Teit 1900:245-6).

Preliminary hide preparation was undertaken in the mountains, though the final stages of dressing the hides seems to have occurred more commonly at winter villages. Simple pole frames were constructed to hold the hides while they were scraped and stretched. As a final step, hides were smoked over a smudge pit; a small hole filled with burning pine cones and twigs (Alexander 1992b:138-9). The meat was cut into strips and then dried by any of several methods: under direct sunlight; by wind, in the shade; by smoke inside the lodges; by the heat of a fire; by hot air, rising from coals; or in structures similar to sweathouses, but larger (Teit 1909:517). Drying in the sun or wind required the construction of a drying rack (Alexander 1992b:124-6).

The basecamps were set up on flat, dry land, close to water, and at the edge of the forest (Tyhurst 1992). The trees provided shelter from the wind and rain, and firewood for roasting pits and hearths. The trees also created a windbreak for meat drying racks so that the smoke from smudge fires could linger and keep flies away. The camps were situated on the lee side of the trees where feasible, with adjacent open meadows being used for general camp activities (Alexander 1992b:121).

parkland localities with numerous potential camp sites and abundant food resources attracted many people, and may be expected to contain large and numerous sites, with high artifact densities. These conditions also created a greater demand for temporary storage and processing facilities, in addition to more elaborate and numerous shelters. The circular depressions produced by cache pits and roasting ovens would probably be the most visible evidence of these features. Although not as numerous or as conspicuous, depressions produced by smudge pits, sweat houses, earth banked lodges, and girls' puberty lodges may also be evident at the surface. At less important localities, these structures were probably either missing or more temporary, and the resulting low density sites would be hard to locate with the heavy ground cover.

Stone hunting blinds would be uncommon but easy to identify in more open areas. On the other hand, isolated kill and/or butchering sites for ungulates, bears, small mammals, or birds would be numerous, but lacking large features or high densities of artifacts to indicate their presence. Butchering sites near blinds, deer fences, salt licks, and other localities where ungulates were frequently encountered would contain higher artifact densities and might be more easily identified, even if the trees and ground cover in forested areas concealed most lithic scatters and features. Baskets, digging sticks and other tools used to collect plants were made from perishable materials such as wood, bone, antler, and horn (Alexander 1992b:107) and as a consequence, plant gathering sites are nearly invisible in the archaeological record. Although the processing and storage of the plant foods typically occurred at basecamps, a few isolated roasting pits and cache pits should also be expected outside the basecamps.

Prehistoric basecamps should be common at the forest margins where there is flat, dry land and a nearby source of water. Most of the activity areas should be in the open areas in front of the trees, but some activities, such as meat drying, may be expected just within the forest margins. Basecamps initially would have consisted of a cluster of small camps, each with its own hearth, shelter, drying racks, etc. Continued reuse of these sites and the superposition of individual sites would ultimately result in what would appear to be a few large sites with varying densities of artifacts and features. At less important localities, these structures were probably either absent or more temporary, and the resulting low density sites would be hard to locate due to the heavy ground cover.

4.7.7 Alpine

The Alpine unit is the same as the Alpine Tundra biogeoclimatic zone (Krajina 1965) and occurs on mountain tops, usually at elevations above 2000 m. In general, Alpine environments are extremely complex with the topography, micro-climate, and vegetation changing significantly over short distances. Each mountain top is like an island and these environmental parameters vary considerably from mountain to mountain. Like the Parklands, Alpine localities are more common and extensive in the northern part of the study area. Severe winters, heavy snowfalls, and short growing seasons are typical of the Alpine unit, with the mean monthly temperature below freezing from 7 to 11 months of the year (Beil *et al*, 1976:51). The cold climate,

together with the low moisture, strong winds and rugged terrain, hinders soil formation processes in the Alpine. Exposed bedrock and rock “pavements” are common at the higher elevations where frost action is accelerated and the wind prevents the accumulation of insulating snow. During the summer months the weather is generally sunny and warm during the day, but the evenings are generally cold, and frost or even snow, may occur any day of the year.

The Alpine unit is characterized by a predominance of low shrubs, grasses, and sedges. Alpine meadows, with a rich and varied **herbaceous** flora, **occur** on flat or gently sloping terrain, where snow packs last longer and provide moister conditions. Although the unit is essentially treeless, krummholz (stunted) forms of a number of subalpine species do occur (Annas and Coupe 1979) including whitebark pine, subalpine **fir**, **lodgepole** pine, Engelmann spruce, and Amabilis **fir** and mountain hemlock near the coastal zones.

Mammal species that were utilized by Natives in the study area and are presently found in the Alpine include: deer, sheep, elk, caribou, mountain goat, grizzly bear, black bear, wolf, coyote, wolverine, marmots, ground squirrels, and long-tailed weasel (Cowan and Guiguet 1975). Due to the deep winter snow pack, these animals are usually found in the Alpine only during the summer and early fall, though caribou, sheep, and mountain goat can survive the winter in snow-free windswept locations.

Although many of the bird species eaten by the local Natives could have been present in Alpine localities in the study area, only the white-tailed ptarmigan is known to occur in any abundance. Wetland habitats suitable for waterfowl are generally very small or absent in the Alpine localities, and few, if any, of these birds were probably present in this environmental unit. Lakes and streams in the Alpine are rarely large enough to support fish or shellfish populations.

The most important food plants found in this unit include spring beauty corms, avalanche lily bulbs, and dwarf mountain blueberries. Spring beauty appears as soon as the snow begins to melt in April, and some are ready for harvesting as early as mid-May, although they are at their peak in early June. The avalanche lily is ready for gathering in July and August, while the dwarf mountain blueberries are ripe in August.

The lack of trees in the Alpine means that there is **little** or no shelter from wind, and no firewood for warmth and cooking food. In most locations, water is also scarce in the Alpine, especially in drier and/or warmer years when snow packs and their runoff disappear early. Given the lack or scarcity of shelter, firewood, and water in the Alpine, even short-term (1 to 2 nights) campsites were probably quite rare in the prehistoric past. Ethnographic accounts do, however, describe daytime forays into the Alpine from the Parkland basecamps. Subsistence activities during these forays consisted primarily of plant gathering by women and hunting and butchering by men.

Although frequently used, the Alpine is expected to contain only small, scattered, archaeological sites with low visibility. Stone hunting blinds are the most visible features. **The**

most common sites are expected to be small kill, and possibly butchering sites, with only a few discarded or lost tools. Butchering sites near hunting blinds or marmot colonies, where repeated kills were made, may be more visible due to greater densities of lithic material. No large hearths, roasting ovens, food caches, shelters, or drying racks are expected.

4.8 Other Cultural Practices Producing Archaeological Sites

Three types of archaeological sites were produced by cultural activities that were not an integral part of the seasonal round of subsistence activities: burial places, rock art sites, and quarries. Ethnographic information that could assist in predicting the location of such sites is discussed below.

4.8.1 Burials

Nearly all burial places were located close to winter villages. The Shuswap, Thompson, and Okanagan-Colville generally placed their burials on a prominent point of land in the main river valleys (Teit 1900:330, 1909:592; Dawson 1892:10). Based on the known location of village sites in the study area, burials are expected to be most common on the River Terraces or around the Intermediate Lakes. The Shuswap tied up the body in a sitting position and placed it within a shallow, circular hole dug in loose, sandy soil or on a talus slope (Teit 1900:328, 1906:269; Boas 1891:643). Graves could be marked with a small pile of boulders, a conical pole hut, carved or painted figures, or with poles bearing some of the person's belongings including tools, weapons, ornaments, and dogs (Teit 1900:328; 1906:269, 1909:592; Dawson 1892:9). Slaves captured in war (women, boys and girls) were sometimes killed and buried in the grave (Teit 1909:592; 1906:270; Boas 1891:643). As many as 100 burials may have occurred in one location (Dawson 1892:9).

People who were poor or died in distant places were sometimes buried where they died and only covered with sticks, branches, bark or stones (Teit 1900:330; 1906:270). In most cases family members either took the body immediately to the burial ground (sometimes after cremation) or temporarily buried the body at the death site before interring it in a burial area one or two years later (Teit 1909:592, 548, 554; Boas 1891:643). Wealthy individuals were sometimes dug up and reburied at a feast (Teit 1900:331, 1909:593).

If two or more deaths occurred while away, from the regular burial grounds, or in winter when the ground was frozen, the bodies were placed around the hearth inside the dwelling lodge which was then abandoned and usually burned (Teit 1906:270; 1900:331). "In after years, when other relatives died, they were often buried at the same place; and thus a burial ground came to be where the lodge had been (Teit 1906:270)." Pithouses were also burnt after 2 or more deaths (Teit 1906:273).

In general, burial places are hard to locate, since permanent markers are small or non-existent. The largest and most easily located burial places would be those near the winter villages, and secondarily, those near important basecamps. Isolated burials are expected to be uncommon and of low archaeological visibility.

4.8.2 Rock Art

Ethnographic and historic accounts of native cultures in the study area provide few clues that could assist in predicting the location of petroglyphs (rock carvings) and pictographs (rock paintings). No explanation is offered for the origins and purpose of the petroglyphs that are commonly found at important fishing stations on the Fraser River. Some pictographs were assigned a mythological origin (Teit 1900:239, 1909:598, 1906:275), but most were known to have been made by boys and girls during their puberty rituals or by men to record their dreams (Teit 1900:317, 321, 1906:265, 275, 282, 1909:590). "These paintings are to be found... in lonely or secluded places near where Indians were in the habit of holding vigil and undergoing training during the period when they generally acquired their **manitous**" (Teit, as quoted in Bouchard and Kennedy 1985: 117). The paintings were sometimes made in caves (Bouchard and Kennedy 1985:120) but are usually found on open rock faced with large protective overhangs (Comer 1968).

In the study area, petroglyphs may be expected near important fishing sites such as those encountered at narrows and rapids. Pictographs are also anticipated in the area, but their location is difficult to predict. These rock paintings may occur anywhere that suitable rock outcrops or caves exist.

4.8.3 Quarries

Many of the tools traditionally used by the Shuswap, Thompson, and **Okanagan-Colville** were made from stone. Not all types of stone were suitable for the manufacture of tools, and good sources of suitable raw materials were few and occasionally worth fighting over (Morice 1894:65). Locations where the lithic raw materials were collected are called quarries.

One of the best and most sought after minerals is obsidian (volcanic glass). The closest known source of obsidian is found in the mountains around Anahim Lake (Nelson and Will 1976). The Carrier and Chilcotin traded obsidian found in this part of their territory to the Shuswap in exchange for salmon and other items (Lane 1953:77-8; Goldman 1953:157; Teit 1909:763-4). Obsidian quarries are not expected in the study area but some obsidian, obtained through trade, may be expected at local sites.

On the Interior Plateau, the stone most commonly used in the manufacture of tools was basalt. The largest known basalt quarries in the study area located in the Arrowstone Range near the Bonaparte River (Teit 1909:519, 645; Dawson 1892:35; Smith 1900:407). Other

sources are located in the Upper Hat Creek Valley and Maiden Creek Valley (Brolly 1981; Rousseau 1989). Basalt cobbles are found in fluvial deposits along the creeks and in the glacial drift and till found at mid-altitude locations on the valley slopes. Cherts and chalcedonies, other stones frequently used to make tools, are also found along Maiden Creek and in Upper Hat Creek Valley (Rousseau 1989). Other sources of chalcedony and chert are known to occur near Savona, Chase, Monte Creek, Kamloops, Walhachin, and Cache Creek. Bands in the study area may have visited these sites to collect stone materials, or they may have received it in trade. It is also possible that small quarries exist elsewhere in the study area, but it would be difficult to predict their location. Site densities are expected to be much higher near these quarry localities.

4.9 Euro-Canadian Settlement and Historic Changes to Native Land Use

The arrival of Euro-Canadians in B.C. resulted in changes to traditional Native subsistence and settlement patterns. The influence of non-Native culture was however, fleeting until 1812 and the establishment of a fur trade post at Kamloops (Balf 1978:3). The establishment of this fort led to a greater dependence on the trapping of fur-bearers and the adoption of Euro-canadian technology including the use of guns, steel traps, wire snares, copper pots, kettles, axes, twine fish nets, and iron knives. Intermarriage with whites led to further acculturation. The Hudson's Bay Company's heavy demands for fish, furs and game led to starvation among the Natives by 1827 (Drake-Terry 1989:26).

The gold rush of 1858 brought many whites into the region. Some of the Natives, took advantage of the employment opportunities opened up by the operation of mines, farms, and ranches. A smallpox epidemic in 1862-3, and other infectious diseases introduced by the whites had devastating effects on the Native population, reducing their numbers by as much as two thirds (Teit 1909:463; Boyd 1985). The influx of thousands of miners caused further hardship for the Natives by reducing natural supplies of fish, game, roots, and berries (Drake-Terry 1989:47).

White settlement quickly followed the gold rush, and non-Native settlers soon outnumbered the Native population. Native reserves were laid out in the 1860's and 1870's as competition between the Natives and whites over land and resources increased. Natives, increasingly aware of the value of the land, made important population shifts from non-arable to arable land that could be farmed or used as pasture (Teit 1900:179). Early and persistent missionary work in the area also disrupted Native social practices (Balf 1978:7-8; Drake-Terry 1989:78-9).

In the early 1900's, new roads and railways opened up the area to additional non-Native settlers and intermarriage with whites and other Native groups increased. Alcohol abuse became an increasing problem. Missionaries became the new authorities of social and moral behaviour, and Native children were forced to attend schools that prohibited traditional language and activities, and left the youth alienated from older family members (Whitehead 1981). In 1950

the federal and provincial governments began to take over health, education, and welfare from the missionaries.

Most Natives now live on small reserves, with many finding employment in fishing, farming, logging, and railroad work. Many still rely heavily on salmon, but dip-netting and drying have been partly replaced by gill-netting and home canning and freezing. In recent years, Natives have taken increasing control of their education and health and have strengthened their determination to maintain a culture *rooted* in traditional values.

5.0 PREVIOUS ARCHAEOLOGY

This section briefly describes and discusses previous archaeological research conducted in the study area. In particular, it emphasises previous research which has generated information particularly relevant to this study. This includes major inventory studies, though more limited studies which have provided unique information about prehistoric land use are also discussed. Detailed data from many of the inventory studies discussed below have been incorporated into the model of archaeological resource distribution presented in Section 6.0.

5.1 Archaeological Inventory of the Kamloops LRMP Region

The Kamloops LRMP Region encompasses some of the most intensively inventoried areas in British Columbia. The earliest documented archaeological investigations conducted in the study area date to the late 1890s (Smith 1900, 1901), but most of the research has been conducted since the mid-1960s. Over one hundred archaeological studies have been conducted in the area, but a relatively small number of major inventories conducted between 1969 and 1987 account for most of the recorded sites in the region. In the eastern portion of the study area these include systematic inventories of the Adams, Little Shuswap, and South Thompson by Fladmark (1969), Brown and Lundborg (1977) and more recently by Mohs and Chisholm (Mohs 1978).

Several major inventory studies have also been conducted in the southwestern portion of the study area. These include: a survey of the Bonaparte and Semlin Valleys in 1975 (Pokotylo 1977), five seasons of extensive investigations in the Upper Hat Creek locality (Beirne and Pokotylo 1979), three seasons of site inventory in the Oregon Jack Creek-Cornwall Hills area (Rousseau et al, 1987, 1989, 1991), an intensive survey of selected Indian Reserves in the Ashcroft area (Rousseau and Friele 1986), and a site inventory of significant segments of the banks of the Thompson River (Arcas 1987). The latter study extended east to Kamloops and then north along the North Thompson River beyond the northern edge of the study area. On a slightly smaller scale, Muckle (1987) directed a survey selected portions of the Deadman Creek valley for the Skeetchestn Indian Band, and Brolly (1981) conducted a judgemental inventory of the central portion of the Highland Valley.

The Kamloops area itself has been subjected to numerous intensive surveys associated with various development activities (Rousseau and Richards 1980; Rousseau and Sumpter 1983; and Richards and Rousseau 1982). Collectively these have resulted in a fairly thorough inventory of the northern half of the city and the southern portion of Kamloops IR#1. Immediately north of Kamloops, Scheidam Flats has been intensively surveyed by a number of researchers (Rousseau and Howe 1987; Arcas 1994; Bastion Group report in progress).

The northern half of the study area has been much less intensively investigated. As mentioned above, portions of the North Thompson River were intensively examined for archaeological sites, though the intensity of this study was quite low beyond (north of)

Clearwater (Arcas 1987). Robert Wilson (1983) conducted an intensive survey of selected locations in the Barriere area, and several small scale judgemental inventories have been conducted in Wells Gray Park (Keddie 1971; Martin and Robinson 1972; Simonsen 1972).

Several site inventories related to hydroelectric transmission line developments have traversed various portions of the study area (Weber and Seymour 1976; Apland 1981; Warner 1980, 1982). Similarly, studies associated with the Coquihalla Highway have also resulted in large scale linear surveys (Arcas 1985a, 1986). In addition to documenting site locations, these extensive linear studies have produced considerable information on where sites are not likely to be found and so contribute considerably to our understanding of site distributions.

Despite the numerous aforementioned investigations, significant portions of the study area have not been subjected to inventory studies. These include most of the upper Adams River drainage; large sections of the North Thompson River, particularly north of Clearwater; Hobson, Murtle and the other large lakes of Wells Gray Park, as well as the many mid-elevation (intermediate) lake areas throughout the study area.

5.2 Major Excavations

A number of important archaeological excavations have been conducted in the study area which have significantly contributed to our understanding of Canadian Plateau prehistory. Again, Harlan I. Smith conducted the earliest formal archaeological excavations in the area, consisting of burial excavations at Kamloops, Spences Bridge, and Lytton in the late 1890s (Smith 1899, 1900). However, not until much later were large scale excavations conducted in the region.

In 1965, Armstrong and Fulton (1965) began investigations at the Drynoch Slide site (EcRi 1) which was determined to be one of the oldest documented sites in the province, yielding a radiocarbon age estimate of 7530 ± 270 BP (years before present) (Sanger 1967). Other "Early Prehistoric" (ca. 11,000 to 7,000 BP; Strydom and Rousseau in press) sites have subsequently been identified and investigated in this general area, including the Rattlesnake Hill site (EeRh 61) north of Ashcroft (Arcas 1985b) and the Landels site (EdRi 11) in the Oregon Jack Creek Valley (Rousseau et al, 1991). These investigations attest to occupation of the western portion of the study area as early as 8500 BP (Rousseau et al, 1991). To the east, only one site of comparable age has been identified. At the Gore Creek site (EeQw 48), near Pritchard, the remains of a single young adult male human yielded a radiocarbon age of 8250 ± 115 BP (Cybulski et al, 1981).

Fairly intensive investigations of small cultural depressions were conducted at several sites in the Upper Hat Creek Valley by Pokotylo and others (Pokotylo 1978; Beime and Pokotylo 1979; Pokotylo and Froese 1983). Data collected during excavation of 15 such features suggests that most, if not all, of these features were used as root roasting ovens. The

investigations indicate that the Upper Hat Creek Valley was used intensively for root roasting between ca. 2250 and 1150 BP.

Most archaeological excavations conducted in the study area have focused on sites containing semi-subterranean habitation structures (e.g., Blake and Eldridge 1971; Sendey 1972; Johnson-Fladmark 1973; Eldridge 1974; Blake 1976; Carlson 1980; Wilson 1980; Richards and Rousseau 1982; Arcas 1983, 1988, 1990; Bailey *et al.*, 1994; Merchant *et al.*, 1994; and others). The Baker site (EdQx 43), near Monte Creek, is the earliest site containing semi-subterranean habitation structures yet investigated in the region. Radiocarbon age estimates ranging between 4,200 and 4,400 BP (Wilson *et al.*, 1992), make it the oldest known village site on the Canadian Plateau. All other village sites investigated in the region have been found to date between 3,400 and 200 BP (Wilson *et al.*, 1992). The numerous investigations of housepit village sites in the study area have allowed for the development of a fairly detailed model of culture history throughout the Late Prehistoric Period (ca. 4000-1350 to 200 BP) for the South Thompson Region (Richards and Rousseau 1987).

5.3 Documented Archaeological Sites in the Study Area

A total of 1,795 archaeological sites have been recorded within the study area. These include 1,620 sites documented as “Prehistoric”, 137 sites documented as “Historic” and 38 sites which are reported to have both historic and prehistoric components. Of the documented “Prehistoric sites”, 37 are isolated finds; these are not treated as archaeological sites in the following discussion and analyses.

5.3.1 Prehistoric Sites

The nature, frequency and distribution of each prehistoric site type is briefly discussed below. Tabulated information on these sites is presented in Tables 3 and 4. It should be noted that numerous sites have multiple types (e.g., Habitation/Burial), consequently, the total number of site types exceeds the total number of sites.

5.3.1.1 Burials

This category includes sites which contain material remains and features typically associated with prehistoric mortuary practices. These include human skeletal remains, burial pits and grave goods. Sixty-two sites in the study area have been reported to contain one or more prehistoric human burials. At 35 of these sites interment of the dead is the only activity represented. The remaining sites exhibit evidence of other activities (primarily habitation, $n=21$). Burials tend to be located near known or potential habitation areas and, as noted above, are frequently encountered at semi-permanent habitation sites. Prehistoric burials have been recorded in the River Valleys, River Terraces and Intermediate Lakes environmental units.

Table 3. Absolute and Relative Frequencies for Recorded Prehistoric Archaeological Site Types within the Kamloops LRMP Study Area.

Site Type	n	f
Burials	62	3.8%
Cache/Roasting Sites	187	11.4%
Campsites	789	48.0%
Fishing Stations	6	0.4%
Habitation Sites	529	32.3%
Quarries	8	0.5%
Rock Art	41	2.5%
Rock Shelters	5	0.3%
Petroforms	9	0.6%

5.3.1.2 Cache/Roasting Sites

This category includes sites which were likely used as cache and/or food roasting areas as indicated by the presence of small (less than 4.0 m in diameter) cultural depressions. It should be noted that these include only those sites which appear to have been used primarily or exclusively for storage and/or roasting activities and do not exhibit evidence of semi-permanent habitation. Cache/Roasting sites are the third most common site type in the study area. Most of the sites of this type recorded within the study **area** are located in Montane Forest,

Intermediate Lakes and Grassland environments. Specifically, the Upper Hat Creek, Oregon Jack Creek and Scheidam Flats Localities account for most of the Cache/Roasting sites documented in the study area.

5.3.1.3 Campsites

This category includes sites which were likely used as short term habitation areas, as indicated by scattered lithic, bone and charcoal debris. Such scatters are often the result of short term use of an area for a specific activity (i.e., game butchering, tool sharpening, or projectile rearming) but may represent multiple occupations of allocation for various activities. By this definition, campsites do not contain cultural depressions. Campsites are the most common archaeological site type, representing almost half (48%) of all prehistoric sites. Campsites are perhaps the most variable site type in terms of distribution, size, function, age and duration of occupation. Collectively, these sites represent many different types of activities. The possible function(s) of these sites include transit camps, hunting/gathering basecamps, kill/butchering areas, game ambush camps and lookouts. Campsites have been identified in all environmental units in the study area and are associated with all prehistoric time-periods.

5.3.1.4 Fishing Stations

This category includes locations used primarily for fishing as well as fish processing and storage. Material remains common to such locations include drying racks (and post holes), hearths, fish bone, and lithic debris. Fishing stations are fairly rare in the study area represented by only 6 sites. It is important to point out that fishing stations are likely to be under-represented here. This is because few researchers use the term “fishing stations” when recording sites. It is likely that many site classified as campsites are actually fishing stations. Fishing stations have only been identified in the River Valleys environmental unit, though they may potentially also occur in Intermediate Lakes areas.

5.3.1.5 Habitation Sites

This category includes sites which were evidently used as semi-permanent habitation areas as indicated by the presence of circular cultural depressions greater than 4.0 meters (housepits) in diameter. Habitation sites are the second most common site type. A total of 529 such sites are recorded in the study area. Habitation sites usually contain a more dense and complex array of features and cultural materials than the other sites types, reflecting the variety and intensity of activities that occurred at these sites. In addition to remains of habitation structures, most Habitation sites contain features such as hearths, cache pits, roasting pits and possibly sweat lodges, puberty lodges, smoke houses, etc. . . Scattered lithic tools and debris as well as bone fragments and fire cracked rock are also commonly found at these sites. In 21 instances human burials have been reported at Habitations sites in the study area. Habitation sites are most

common in the River Terrace environmental unit, though they have also been found in the River Valley and Intermediate Lakes units. Habitation sites date exclusively to the last 4400 years and are most common between 3500 and 200 years BP (Wilson *et al*, 1992; Richards and Rousseau 1987).

5.3.1.6 Quarries

This category includes locations which were used by prehistoric people to obtain raw materials for lithic tool manufacturing. These include specific locations where high quality lithic raw materials can be found. Cultural material typically encountered at quarries include dense concentrations of flaked cobbles and other lithic debris. Eight quarry sites have been recorded in the study area. These include sites at Maiden Creek, Arrowstone Hills, Cache Creek, Kamloops, Mount Savona, Monte Creek, and Chase. These are all locations where outcrops or cobble beds of high quality lithic materials suitable for use in the manufacture of stone tools can be found. Only one of these sites has been subjected to detailed investigation, this being the “Ducks Meadow Quarry Site” near Monte Lake (Rousseau and Muir 1992).

5.3.1.7 Rock Art

This category includes sites which contain relatively immobile pictographs (rock paintings) and petroglyphs (rock carvings/etchings) typically found on bedrock outcrops or large boulders. Rock art has been reported at 41 sites in the study area. Thirty-five of these sites consist exclusively of rock art, while additional cultural remains are present at the remaining six sites. The age of these sites is undetermined, though it is likely that most of them, particularly the pictographs, are less than 1,000 years old. Older rock art would likely have been obscured or destroyed through natural erosion processes. Rock art has been recorded in all environmental units except Intermediate Grasslands and Montane Parkland.

5.3.1.8 Rock Shelters

This category includes sites which are located beneath overhangs of rock or at the base of steep cliffs. In all other respects these sites are similar to campsites. Five rock shelter sites are recorded in the study area. These sites exclusively occur within the “Three Sisters” and “Marble Canyon” geologic formations, which run along the southwestern edge of the study area. Only one such site has been investigated in the study area (EdRi 2) and was found to contain evidence of multiple occupations ranging between ca. 1500 and 7100 BP (Rousseau *et al*, 1991). Rock art is also associated with most of these sites.

5.3.1.9 Petroforms

This category consists of sites which consist exclusively of stone features such as cairns, walls or other artificial rock alignments. Nine petroform sites have been recorded in the study area. These sites consist of stone cairns, hunting blinds, and drive-lane fences. Most of these sites have been attributed to the prehistoric period based on associated artifact scatters, though it is usually impossible to be certain of the age of these features. Little detailed research on these features has been conducted. Sites of this type have been found only in the River Terrace and Montane Parkland environmental units.

Table 4. Distribution of Recorded Prehistoric Archaeological Sites by Environmental unit.

Environmental Unit	Archaeological Site Type *								
	B	C/R	C	FS	H	Q	RA	RS	P
River Valleys	X	X	X	X	X	X	X		
River Terraces	X	X	X		X	X	X		X
Intermediate Lakes	X	X	X		X		X	X	
Intermediate Grasslands		X	X						
Montane Forests		X	X			X	X	X	
Montane Parkland		X	X			X			X
Alpine			X				X		

* B = Burial sites; C/R = Cache/Roasting Sites; C = Campsites; FS = Fishing Stations; H = Habitation sites; Q = Quarry; RA = Rock Art; RS = Rock Shelters; P = Petroforms.

X indicates resource has been documented in given environmental unit.

5.3.2 Historic Sites

Nine types of historic sites have been identified in the study area. The nature, frequency and distribution of each historic site type is briefly discussed below. Tabulated information on these sites is presented in Tables 5 and 6.

5.3.2.1 Cemeteries

This category includes material remains commonly associated with mortuary practices during the historic period (i.e., post A.D. 1800). These include human skeletal remains, grave markers (headstones etc.), grave fences, and caskets. Thirteen sites in the study area have been classified as cemeteries. These include sites containing single and multiple human interments dating to the historic period. These sites are situated exclusively within the River Valley and River Terrace environmental units.

5.3.2.2 Farming/Ranching

This category includes remains and features associated with ranching and farming activities of historical significance, including bunkhouses, corrals, barns, workshops, and slaughterhouses. Nine sites attributed to farming and/or ranching activities have been identified in the study area. Most of these sites consist of corrals, barns and other farmyard structures, though more elaborate features such as irrigation workings have also been recorded. The farming/ranching sites have been found in the River Valleys and Intermediate Lakes environmental units.

5.3.2.3 Fur Trade

This category includes remains and features associated with historical fur trade activities, including trading posts, forts, and cabins. Only two sites associated with fur trade activities have been identified in the study area. These include Fort Thompson located in Kamloops and the fur trade post at Little Fort. Both of these sites are located in the River Valleys environmental unit.

5.3.2.4 Habitation Sites

This category includes material remains and features associated with historic settlement in the study area. Examples include homesteads, and isolated cabins. Among the historic sites, Habitation sites are by far the most common, representing more than two thirds of the documented site types. The most common habitation remains are documented simply as “log cabins”. Many of these cabins may be associated with other activities such as ranching,

farming, mining, etc., however, because no further information is provided about them they have been assigned to the Habitation type category. Historic habitation remains have been found in all environmental units with exception of Montane Parkland and Alpine environments.

5.3.2.5 Historic Structures

This category includes existing buildings and monuments which have been declared “heritage sites” based on their historical significance to community or region. Ten such structures have been designated in the study area. Most of these are still standing and functioning, though not necessarily in their original capacities. All of these structures are located in the City of Kamloops.

5.3.2.6 Logging

This category includes structural remains and features associated with industrial logging activities of historical significance, including bunkhouses, workshops, cookhouses, logging railroads, and mills. Only one site associated with historic logging activities has been recorded in the study area. This consists of the remains of a small sawmill located on the shore of Niskonlith Lake, west of Chase. The site is situated in the River Valleys environmental zone.

5.3.2.7 Mining

This category includes material remains and features associated with industrial mining activities, including quarries, shafts, **adits**, prospects, and other workings, bunkhouses, workshops, and cookhouses. Four sites associated with historic mining activities are recorded in the study area. All of these sites consist of placer mining workings along the banks of the Thompson River.

5.3.2.8 Refuse

This category includes sites which consist of scattered historic debris, with no apparent associated features which suggest a specific function or activity. Eight sites are reported to contain a historic component consisting solely of scattered debris such as tin cans, broken glass, nails and shell casings. It is likely that such refuse is common at archaeological sites, though rarely considered worth reporting by researchers.

5.3.2.9 Transportation

This category includes structural remains and features associated with wagon-tram, stage-coach or railway operations of historical significance, including trails, roads, bunkhouses, workshops, cookhouses, construction camps, posts and stations. Nine sites have been reported to contain features and artifacts associated with historic commercial transportation operations. These primarily include railroad construction camps, recorded along the CN Rail right-of-way, but also include several stage coach posts, and a segment of wagon road. All of these sites are located in the River Valleys environmental unit.

Table 5. Absolute and Relative Frequencies for Historic Archaeological Site Types within the Kamloops LRMP Study Area.

Site Type	n	f
Cemetery	13	7.5%
Farming/Ranching	9	5.2%
Fur Trade	2	1.2%
Habitation	116	67.1%
Historic Structure	10	5.8%
Logging	1	0.6%
Mining	4	2.2%
Refuse	8	4.6%
Transportation	9	5.2%

Table 6. Distribution of Recorded Historic Archaeological Sites by Environmental unit.

Environmental Unit	Archaeological Site Type *								
	C	F/R	FT	H	HS	L	M	R	CT
River Valleys	X	X	X	X	X	X	X	X	X
River Terraces	X	X		X					X
Intermediate Lakes		X		X					
Intermediate Grasslands				X					
Montane Forests				X					
Montane Parkland									
Alpine									
* C = Cemeteries; F/R = Farming/Ranching; FT = Fur Trade; H = Habitation; HS = Historic Structures; L = Logging; M = Mining; R = Refuse; CT = Commercial Transportation. X indicates resource has been documented in given environmental unit.									

53.3 Site Distributions

Archaeological sites have been documented in all of the environmental units present in the study area, though not all types of sites are found in all environments (see Tables 4 and 6 above). The River Valleys and River Terraces environmental units have produced the largest number of sites as well as the widest range of archaeological site types. This is, no doubt, partly because these areas have been more intensively surveyed than other environments within the study area, though it also likely reflects true greater absolute density and diversity of sites in these environments. The ethnographic record indicates that these areas were traditionally used most intensively and they continue to be the primary **areas** of human occupation today.

The Alpine environmental unit has produced the lowest number and variety of archaeological sites. To date, only prehistoric campsites and rock art sites have been identified in alpine areas. Very little research has been conducted in Alpine environments and this is likely partially responsible for the observed low number and diversity of sites. The ethnographic record suggests that a greater number and wider variety of sites should be found in Alpine areas.

Visual examination of site distributions in intensively surveyed areas suggests that sites tend to display a clustered rather than random or uniform distribution throughout any given environmental unit. Beirne and Pokotylo (1979) identified several micro-environmental factors which appeared to influence prehistoric site distributions in the Upper Hat Creek locality. These included natural resource values, proximity to water, and ground slope. Data on these variables and several others has been gathered here, from several more recent studies, to help assess the effects of such micro-environmental variables (Table 7). Variables **analysed** include distance from water, ground slope, view of surrounding terrain (View), local drainage quality (Drainage) and ungulate capability. Several other micro-environmental variables including waterfowl capability, local vegetation and aspect were also considered but proved to be of little value due to skewed and/or inadequate samples. It should be noted that a rigorous statistical interpretation of the data is not attempted here and it would be precarious to accept the values provided in Table 7 as "critical values" in the determination of potential site locations. The observations simply provide some idea of the influence that the various micro-environmental variables have on the distribution of archaeological sites.

Perhaps the strongest influence is displayed by the values for "distance from water". In most of the examined areas sites tend to cluster around reliable sources of fresh water. This is particularly evident among the Scheidam Flats sites, where more than 80% of all the sites encountered were within 170 m of a permanent water source despite a survey area which extended more than 1250 m from water. This same pattern is displayed, though to a lesser degree, at **Ashcroft** and Oregon Jack Creek.

The distance from water values obtained for the Cornwall Summit locality display a considerably different pattern. The sites in this locality are all located a considerable distance (>800 m) from water. It is important to note that there are no permanent water sources on Cornwall Summit itself and this is no doubt why the clustering which is evident in the other areas is not seen here. Nevertheless, the Cornwall Summit data suggests that site distributions in some environments (such as **Montane** Parkland or Alpine areas) may be largely independent of the location of permanent water sources.

The observations obtained for ground slope strongly indicate a preference for very flat site locations in the Ashcroft, Oregon Jack Creek and Scheidam Flats localities. Most of the sites in these areas are located on terrain which has a ground slope of 0.20 (9") or less despite slopes of 1.0 (45") and greater within the study area. Again Cornwall Summit exhibits a very different pattern with sites typically located on much steeper terrain with ground slopes of as much as 0.80 (36").

Table 1. Observed values for examined MICRO-Environmental Variables from Selected Localities in the Study Area.

Study Area	Environmental Unit	n	Distance From Water (in meters)			Ground Slope			View			Drainage			Ungulate Capability **		
			Mean	80%*	Max	Mean	80%*	Max	Good	Mod	Poor	Good	Mod	Poor	High	Mod	Low
Ashcroft	River Terraces	97	436	800	1800	.04	.15	.30	40%	60%	0%	44%	54%	2%	n/a	26%	74%
Cornwall Summit	Montane Parkland	11	1090	1200	1450	.39	.80	.80	73%	27%	0%	73%	18%	9%	n/a	100%	n/a
Oregon Jack Creek	River Terraces/ Montane Forest	55	120	280	500	.10	.20	.76	31%	52%	17%	20%	69%	11%	n/a	100%	n/a
Scheidam Flats	Intermediate Lakes/Intermediate Grasslands	50	140	160	1250	.11	.19	1.0	0%	96%	4%	4%	96%	0%	6%	94%	n/a

* value below which 80% of observations fall.

** ungulate capability as mapped by Environment Canada 1976, High = Classes 1 through 3W, Moderate = Classes 3 or 4, Low = Classes 5 through 7.

The data for view of surrounding terrain suggests a general preference for locations with moderate to good views, and few sites were found in locations with poor drainage.

The data on ungulate **capability** is difficult to interpret since each of the studied localities had a very limited range of values for this variable. However, the data does strongly suggest that ungulate capability is not a determining factor of site locations in River Terraces environments. It is likely that availability of Salmon has a much stronger (over-riding) influence in such areas.

5.3.4 Site Densities

Information on site densities has been generated from several major intensive inventory studies conducted in the region (Table 8). All of these studies have been carried-out in areas which would conventionally be considered to have high archaeological site potential and thus are likely to have significantly higher site densities than is average for the study area. Although the selected studies collectively do not provide a representative sample of the study area they do give some indication of the potential range and **variability of** site densities.

Site densities from the selected studies range between 0.2 and 44 **sites/km²**. Site densities from most of the studies fall between 2 and 10 sites/km². The highest densities are reported for the river terrace and intermediate grassland environmental zones in the southwestern portion of the study area (i.e., the **Ashcroft** and Upper Hat Creek localities respectively), while studies conducted in forested and upland areas tend to have lower site densities. Considerable variability in site density is displayed in some areas, particularly Scheidam Flats, the forested portions of Upper Hat Creek and the **Barriere** locality along the North Thompson. It is likely that the sites in these localities display a clustered distribution due to the distribution of locations with particularly favourable micro-environmental **attributes, such** as fresh water, flat ground, and plant resources and/or wildlife.

Table 8. Archaeological Site Densities for Intensively Surveyed Localities in the Study Area.

Survey Area	Environmental Unit	Site Density
Lower Oregon Jack Creek (Rousseau et al 1991)	River Terrace	20 to 44 sites/km ²
Upper Hat Creek (Beirne and Pokotylo 1979)	Intermediate Grasslands	10.4 to 27.1 sites/km ²
Scheidam Flats (Arcas 1994)	Intermediate Lakes/ Grasslands	0.2 to 19 sites/km ²
Ashcroft I.R. 2 and 4 (Rousseau and Friele 1986)	River Terrace	10.5 sites/km ²
Woodcutter Lake (Rousseau et al 1991)	Intermediate Lakes	9 sites/km ²
Upper Hat Creek (Beirne and Pokotylo 1979)	Montane Forest	1.7 to 7.3 sites/km ²
Barriere (Wilson 1983)	River Valley/Terrace	2 to 6 sites/km*
Upper Hat Creek (Beirne and Pokotylo 1979)	Intermediate Grasslands/Montane Forest	3.1 to 6.3 sites/km ²
Upper Oregon Jack Creek (Rousseau et al 1989)	Montane Forest	4 sites/km ²
Cornwall Summit (Rousseau et al 1987)	Montane Parkland	2.2 sites/km ²

6.0 OVERVIEW RESULTS

This section presents a model of archaeological resource distribution in the study area, which has been applied in the creation of the archaeological resource map set which accompanies this report. The model is followed by a review of prevalent gaps in our current knowledge of the archaeology of the Kamloops LRMP region and finally a discussion of the value and limitations of this study.

6.1 A Model of Archaeological Resource Distribution in the Study Area

Based on the ethnographic overview provided in Section 4.0 and what is known about the nature and distribution of prehistoric archaeological sites in the region (Section 5.0) a general model of archaeological site distribution has been developed for the study area. Table 9 presents an overall summary of known and predicted archaeological site distribution by environmental unit. Favourable values for micro-environmental variables influencing site distributions are presented in Table 10. The mapping of archaeological resource polygons has been conducted according to the information presented these tables. Specifically, areas within a given environmental unit displaying three favourable micro-environmental values are assessed to have archaeological site potential at the low end of the assessed range of site potential (from Table 9). Areas displaying favourable values for more than three variables are assessed to have site potential equal to the high end of the assessed site potential for that environmental unit. Areas which display fewer than two favourable micro-environmental values are assessed to have low site potential. Several locations have also been assessed Nil site potential values; these are all areas which have been extensively disturbed by recent industrial (mining) activities and thus archaeological resources in these areas have been obliterated.

Specific site density values are based on comparison of a given area to intensively investigated areas displaying similar environmental characteristics. The three site density categories (High, Medium and Low) have been defined based on these observed values. These categories are largely subjective since there is little “hard” data on which to evaluate typical or atypical site densities throughout the study area, however, we believe that the categories are adequate for the purposes of this study and should prove useful in resource management planning. High site density areas include locations where more than 10 sites/km² are likely or known to occur. Known areas of “High” site potential include Lower Oregon Jack Creek, Ashcroft I.R.s 2 and 4, portions of Upper Hat Creek and portions of Scheidam Flats. Other areas which are similar to these in terms of environment and natural resource distribution have also been assessed to potentially have High site densities. Medium site density (1 to 10 sites/km²) areas include most other locations displaying moderate to high site potential. These include many of the areas which have been intensively surveyed (listed in Table 8). Low site density (less than 1 site/km²) areas include all areas assessed to have low archaeological site potential as well as some locations with moderate or high potential in environmental settings with sparsely distributed resources, such as some Alpine and Montane Parkland areas.

Table 9. Known and Expected Archaeological Site Distribution by Environmental unit.

Environmental Unit	Important Natural Resources	Predominant Ethnohistorically Documented Uses	Documented Archaeological Site Types		Archaeological Potential Assessment			
			Prehistoric	Historic	Prehistoric Site Types	Historic Site Types	Site Potential ¹	Site Density ²
River Valleys	salmon, various other fish, mussels, various large and small game, waterfowl, river/lake access	fishing, fish processing, habitation, food storage, food processing/cooking, trade, hunting/butchering	fishing stations, campsites, cache/roasting sites, habitation sites, burials, rock art, quarries	all types	fishing stations, campsites, cache/roasting sites, habitation sites, burials, rock art, quarries	all types	medium to high	medium to high
River Terraces	shelter, various large and small game, river access	semi-permanent habitation, hunting/butchering, food storage, plant gathering	habitation sites, cache/roasting sites, burials, rock art, campsites, quarries	cemeteries, habitation sites, commercial transportation sites	habitation sites, cache/roasting sites, burials, campsites, rock art, quarries	all types	medium to high	medium to high
Intermediate Lakes	trout, sucker, whitefish, wood, ungulates, other game, waterfowl, various edible plants	semi-permanent habitation, fishing, hunting/butchering, plant gathering	habitation sites, cache/roasting sites, campsites, burials	farming/ranching sites, habitation sites	habitation sites, campsites, cache/roasting sites, fishing stations, burials	farming/ranching sites, habitation sites, logging	medium to high	low to medium
Intermediate Grasslands	deer, balsamroot, berries, other edible plants, waterfowl, grouse	hunting, plant gathering, root roasting, transit camping	campsites, cache/roasting sites	habitation sites	campsites, cache/roasting sites	farming/ranching sites, habitation sites	medium to high	low to high
Montane Forests	wood, various large and small game, various edible plants	hunting, plant gathering, wood procurement, transit camping	campsites, cache/roasting sites, quarries, rock art, rock shelters	habitation sites	campsites, cache/roasting sites, quarries, rock art, rock shelters	habitation sites, logging	low to medium	low to medium
Montane Parkland	ungulates, small game, grouse, edible plants, berries, edible roots	hunting, plant gathering, root roasting, short-term habitation	campsites, cache/roasting sites, quarries, petroforms	none	campsites, cache/roasting sites, petroforms	none	medium to high	medium
Alpine	large game, berries, edible plants	hunting, plant gathering	campsites, rock art	refuse scatters	campsites, petroforms, rock art	none	medium to high	low

¹ Specific values are dependant on micro-environmental characteristics such as slope, proximity to water, resource values, etc....

² high = > 10 sites/square km; medium = 1 to 10 sites/square km; low = < 1 site/square km.

Table 10. Favourable Values For Micro-Environmental Variables Influencing Archaeological Site Distribution.

Environmental Unit	Distance From Water	Ground Slope	View of Surrounding Terrain	Wildlife Values*	Drainage
River Valleys	any	< .30	any	moderate or high	moderate or good
River Terraces	< 800 m	< .30	moderate or good	moderate or high	moderate or good
Intermediate Lakes	< 300 m	< .30	moderate or good	moderate or high	any
Intermediate Grasslands	< 300 m	< .30	moderate or good	moderate or high	moderate or good
Montane Forests	< 300 m	< .30	n/a	moderate or high	moderate or good
Montane Parkland	any	< .80	good	moderate or high	moderate or good
Alpine	any	< .80	good	moderate or high	moderate or good
* includes salmon, ungulates and/or waterfowl					

6.2 Data Gaps

To facilitate cultural heritage resource management and land use decision making, it is important to have an inventory of archaeological resources that is as complete as possible. This means that there should be no major gaps in the geographic coverage of the inventory, nor should there be a bias in the inventory towards the exclusion or inclusion of specific types of archaeological sites. Furthermore, the information in the inventory must be backed by a solid corpus of cultural historical information derived from scientific excavations of various types of archaeological sites to be complete, accurate, and current.

Our review of the current state of knowledge regarding known and potential archaeological resources in the Kamloops LRMP region identified several gaps thought to be of signifi-

cance. Broadly speaking, these can be described either as inventory-related issues or excavation-related issues.

Data gaps that can be addressed by expanding the inventory of known sites include: (1) incomplete geographic coverage of the left bank of the Thompson River along the CP Rail right-of-way; (2) incomplete geographic coverage of lowland secondary drainages south of the Thompson River; (3) incomplete geographic coverage of the major lakes in the northern part of the study area; (4) incomplete geographic coverage of upland lakes throughout the study area; (5) incomplete geographic coverage of alpine environments in the northern portion of the study area; (6) traditional travel routes through the Kamloops LRMP need to be identified, and associated sites identified and added to the inventory; and (7) additional lithic raw material quarries should be identified and added to the inventory.

Data gaps that can be addressed by additional archaeological excavations in the Kamloops LRMP will primarily be undertaken as components of research projects, but are necessary to provide information required to evaluate the significance of archaeological resources threatened by terrain-altering developments. Data gaps in this category include; (1) the issue of the initial settlement of the study area by Native people in the post-Glacial period; (2) the distribution, configuration and integrity of Early Prehistoric sites in the study area; (3) issues pertaining to existing models of prehistoric culture history in the study area, and how they may relate to the origins of extant Native cultures; (4) a regional and temporal perspective on the variability of semi-subterranean pithouse design and construction; and (5) a regional perspective on the types and intensity of non-residential activities that occurred outside of the houses at winter villages.

6.2.1 Survey Coverage of Left Bank of the Thompson River

Archaeological site inventories in the Kamloops LRMP region have focused on lowland survey along major streams, including the Thompson River. However, many sections of this river have very difficult access, and only one side can be said to have been systematically surveyed. The CN Rail right-of-way, predominantly on the right bank of the river, was examined between Kamloops and the southern boundary of the study area (Arcas 1987; Mohs 1984), but no comparable survey has been carried out along the CP Rail right-of-way, which traverses the left bank of the river. Many sections of this right-of-way traverse unsurveyed terrain of high potential for containing hitherto undiscovered archaeological resources.

6.2.2 Lowland Secondary Drainages South of the Thompson River

Many secondary drainages in the southern part of the Kamloops LRMP region are rather poorly-known from an archaeological perspective, primarily because most of the site inventory work that has been done in these areas occurred several years ago and were not surveyed with the degree of thoroughness which is now standard practice. Most of these streams are minor tributaries of the Thompson and South Thompson Rivers, and predominantly lie within the River

Terraces environmental setting. According to our model of site distribution in the study area, there should be many more sites in these areas than are currently recorded.

6.2.3 Major Lakes in Northern Part of the Study Area

Little or no systematic surveys of archaeological resources have focused on the large lakes in the northern part of the Kamloops LRMP region. These include **Mahood**, Hobson, Azure, Clearwater, and Murtle Lakes in Wells Gray Provincial Park. A few sites have already been identified in these areas, but serve primarily to indicate that additional, undiscovered archaeological resources will be present.

6.2.4 Upland Lakes Throughout the Study Area

Because few terrain-altering developments have occurred in upland lake locations throughout the study area, these localities have been largely neglected from an archaeological perspective. The ethnographic record indicates that these areas have moderate to high potential for certain types of archaeological resources, particularly hunting basecamps. The few studies that have been conducted in such environments have consistently resulted in the identification of archaeological sites, usually consisting of campsites, although some **appear** to have been quite intensively-occupied (e.g., Brolly 1981; **Arcas** 1985a; Rousseau et *al* 1991; Muir 1994).

6.2.5 Alpine Environments

Traditional use of alpine environments has been documented in the ethnographic record, but the nature of archaeological resources in such areas is poorly understood. Alpine areas may have been of even greater importance during warmer climatic periods in the prehistoric past, when expansion of high-elevation grasslands resulted in locally-higher carrying capacity for ungulate populations. Only one survey of alpine habitats in the Kamloops LRMP region has been conducted, this being Keddie's (1971) brief judgmental survey of Trophy Mountain in Wells Gray Park. Future archaeological research may well prove our current potential assessments of the areas to be overly conservative.

6.2.6 Traditional Travel Routes

To date, no dedicated archaeological investigations of traditional or potential prehistoric travel corridors have been conducted for the study area. This information would be valuable in allowing prediction of short-term habitation and transitory camp sites, as well as prehistoric trade and migration routes. Such investigations should attempt to determine how changes in climate and local geography may have influenced or dictated travel throughout the prehistoric period. Lastly, the fur-trade routes used by the Hudson's Bay and North West Companies are

known to traverse much of the Kamloops LRMP region (K.Favrholdt, U.C.C., pers. comm., 1992), and apart from their intrinsic historic heritage significance, were almost certainly pioneered over existing aboriginal trails.

6.2.7 Lithic Raw Material Quarries

The sources of many of the lithic materials that appear at archaeological sites in the study area are not known. This is particularly true of many of the high quality cryptocrystalline silicates (**cherts** and **chalcedonies**) that commonly occur in archaeological contexts. Information on lithic sources can provide considerable insight into prehistoric economics, trade, travel, migrations and group interactions. In turn, this information can contribute significantly to our understanding of the origin and development of Interior Plateau cultures.

6.2.8 Initial Peopling and Early Prehistoric Sites

Palaeoenvironmental studies in this region indicate that mid-elevation and higher environments were free of glacial ice by about 12,000 BP (Hebda 1983). Valley bottoms were choked by stagnant ice for several centuries more, and for the next **5,000** to 6,000 years were occupied by post-glacial lakes with low resource productivity. By contrast, higher locations would have been attractive environments for human settlement as soon as they were vegetated after deglaciation, or perhaps by about 10,000 - 11,000 BP. **Sites** attributable to the earliest settlement of the Kamloops LRMP will probably not be located in valley bottoms, and might be very deeply buried beneath accumulated sediments. However, if they exist, they would probably be associated with ancient grasslands and lakeshore habitats at middle and high elevations.

Only two Early Prehistoric period sites have been documented in the Kamloops LRMP region, at Gore Creek near Pritchard and on Oregon Jack Creek near Ashcroft. However, some additional, uninvestigated early sites in the study area have recently been identified by Rousseau (1994). There are numerous localities throughout the Kamloops **LRMP**, particularly at low and middle altitudes, that possess a suite of environmental attributes which can be predicted to occur at archaeological sites of this antiquity.

6.2.9 Models of Culture History and the Origins of Extant Native Cultures

Many, if not most, of the archaeologists who have carried **out** investigations of prehistoric sites in the Kamloops LRMP region have assumed that at least the latest prehistoric interval (the so-called Kamloops horizon) is culturally linked with Native cultures that were present in the region at the time of contact with Europeans. Other **authorities (e.g., Stryd and Rousseau 1993)** have asserted that the antecedents of Interior **Salishan** culture can be traced to a much earlier date, such as the 5500 - **3500** BP Lochnore Phase. The veracity of these hypotheses should be tested, particularly in light of recent challenges to the prevailing model of

Interior Plateau culture history (e.g., Wilson et al, 1994). Further research is also required to **refine** the latest prehistoric period, and determine if the different tribal groupings such as Shuswap, Thompson, and Okanagan-Colville can be identified in the archaeological record. Furthermore, a particularly important ethnic consideration that should be addressed relates to the arrival and presence of the now-extinct, Athapaskan-speaking Nicola people, who resided in the southern extremity of the Kamloops LRMP region.

6.2.10 Variability of Pithouse Design and Construction

As described in Section 5.2, most of the archaeological excavations that have taken place in the Kamloops LRMP region and surrounding areas have focused on **pithouse** villages. Despite these investigations, there is no regional perspective for **pithouse** design variability on the Interior Plateau, although at least a few studies have addressed this issue. An appropriate program of research in light of this issue could result in a regional model of **pithouse** construction technique and perhaps identify certain variables that are of ethnic significance. For example, a remarkable diversity in **pithouse** configurations along the South Thompson River, including square to rectangular forms with elaborate side-entrance tunnels, is unmatched anywhere else in the Interior Plateau. It has been suggested that this is in some way related to a ethnically Shuswap construction **practise**, which could be verified by further, research-oriented excavation.

6.2.11 Non-Residential Activities Occurring at Winter Villages

As a corollary to the above, the strong emphasis on **housepit** archaeology in the study area has resulted in under-representation of non-residential activities at **pithouse** villages. There can be serious implications of this factor from a resource management perspective, for without an appreciation of the range and intensity of activities outside the houses at village sites, the dimensions of such sites can often be greatly underestimated.

6.3 Study Limitations

At the outset of this study it was our intention to establish a firm understanding of archaeological resource distribution throughout the Kamloops LRMP region through analysis of the distribution of known resources and examination of the ethnographic record. To some extent this has been done successfully, particularly with respect to making use of the ethnographic record. However, we feel the quality of the results of the the study have been limited by a number of factors.

The accuracy, and hence usefulness, of a study such as this is limited by the quality of the data on which it is based. Though there has been considerable research conducted in the Kamloops LRMP region, the way in which data from these studies is managed hampers the

usefulness of this information. The current archaeological site inventory exists in two forms: (1) the B.C. Archaeological Site Inventory comprised of B.C. Archaeological Site Inventory Forms, with one form per recorded site; and (2) the Canadian Heritage Inventory Network (CHIN), an electronic inventory that contains information from the B.C. Archaeological Site Inventory but without site maps. Information in both the B.C. Archaeological Site Inventory and CHIN exhibit several shortcomings. Firstly, sites identified before about 1977 were usually not recorded to contemporary standards, and often lack information required for resource management purposes. Secondly, many of the sites recorded in the study area have not been revisited for over 10 years, and it is not clear if available information about these sites, particularly site condition, ownership status, and adverse impacts caused by development, is current. Thirdly, some data fields on the B.C. Archaeological Site Forms and in CHIN have been recorded inconsistently. This is particularly true for sites recorded prior to the 1980s, but contemporary archaeologists do not necessarily report certain fields in a systematic fashion. This deficiency is especially apparent for the "site class", "site type" and "feature" fields. Lastly, many of the CHIN records contain data entry errors, ranging from minor typographic errors to incorrect site types and site locations. Collectively, these deficiencies make evaluation of site information, quantification of resource types, sorting of digital databases, and electronic mapping of resource types difficult and fraught with problems.

With the creation of the digital map set and associated databases we have been obliged to compound this problem by creating a third source of site information which unavoidably incorporates many of the shortcomings and errors inherent in the original data sources. Before GE-based digitized mapping becomes a common tool in archaeological resource planning, it is critical that the data which is "implanted" in these systems is accurate. Furthermore, we see no value in creating yet a third independent source of site information, which would require regular updating and is likely to become infested with the same problems currently exhibited by CHIN. Instead, site information from CHIN should be linked directly to the GIS system.

The scale at which the study was conducted also hindered the precision of the potential assessments. Mapping at 1:250,000 scale precludes the possibility of identifying specific land forms which may display particularly high archaeological site potential. This is especially critical for the prediction of certain site types, including rock shelters, rock art, burial places and "Early" sites. Rockshelters, burial places and rock art sites do not lend themselves easily to accurate potential assessment and predictive mapping on a very coarse scale. "Early" sites are likely to be associated with post-glacial landform features such as ancient lakeshores and river terraces, which cannot usually be accurately identified at a scale of 1:250,000.

A third problem is related to the suitability of the current site dataset to be used in analyses of site distribution. None of the detailed studies discussed in this report were conducted with the purpose of creating a model of site distribution in mind. Consequently the collected data are in many respects not amenable to rigorous statistical analyses. Our interpretation of this data has been inhibited by a severe lack of "control" over the data. Ultimately it would have been preferable to conduct a site survey program specifically designed to gather data for this model, rather than relying on previous research which was not intended to be used in this way.

Lastly, as noted above there are a number of gaps in our understanding of Interior Plateau prehistory. Many of these have a direct affect on our ability to model site distributions. Perhaps most serious of these is our lack of understanding of the distribution of Early and Middle Prehistoric sites. While the ethnographic record provides us with a reliable analogue for the Late prehistoric period, it probably does not accurately reflect land use and settlement patterns of earlier times. So few Early and Middle prehistoric sites have been positively identified in the study area that it is difficult to model their distribution based solely on the archaeological record.

7.0 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the results of this overview, the following recommendations are made concerning the need for further archaeological studies in the Kamloops Forest District, LRMP region,

To address the gaps in existing knowledge in the study area as defined in Section 6.2 above, we recommend that:

- (1) Future inventory related research in the study area be oriented toward improving geographic coverage. This should include addressing one or more of the gaps in geographic coverage identified in this study. Specifically these include: (i) the left bank of the Thompson River; (ii) lowland secondary drainages south of the Thompson River; (iii) major lakes in the northern part of the study area; (iv) upland lakes throughout the study area; (v) alpine environments in the northern portion of the study area;
- (2) Future site investigations and other detailed research be oriented toward improving our understanding of (i) traditional travel routes; (ii) lithic raw material sources; (iii) initial settlement of the study area by Native people in the post-Glacial period; (iv) the distribution, configuration and integrity of **Early** Prehistoric sites in the study area; (v) issues pertaining to existing models of prehistoric culture history in the study area, and how they may relate to the origins of extant Native cultures; (vi) regional and temporal variability of semi-subterranean **pithouse** design and construction; and (vii) the types and intensity of non-residential activities that occurred outside of the houses at winter villages.
- (3) Future archaeological research, including standard archaeological impact assessments, **not** be limited to areas determined to have moderate to high archaeological site potential in this report. The scale at which this study was conducted severely limits the precision with which assessments have been made. Furthermore, our **knowledge** of the distribution of archaeological resources in the study area is not adequate to allow us to dismiss any areas as “not worth investigating”.

To address **deficiencies** in the current archaeological site inventory and in present-day recording procedures discussed in Section 6.3 above, we recommend that:

- (4) The Archaeology Branch ensure greater consistency in the manner in which B.C. Archaeological Site Inventory forms are filled in, particularly as it relates to information on site class, site type and features.
- (5) Existing B.C. Archaeological Site Inventory and CHIN records should be reviewed for significant data entry errors, and for consistencies in the way in which information has been entered into the “site class”, “site type”, and feature fields.

Finally, we recommend that:

- (6) Development of management strategies for endangered archaeological resources and any detailed archaeological investigations conducted in the study area include involvement of local First Nations. Consultation with local First Nations is a requirement of all detailed archaeological research in British Columbia, however, it has been our experience that consultation is most constructive and satisfactory to all parties when local Native groups are directly involved in archaeological research. It is important to note that this study has dealt exclusively with archaeological and ethnohistorically documented resources. Contemporary heritage concerns of local Native peoples have not been addressed here. We do, however, strongly recommend that the ethnic significance -- the importance assigned to a heritage site by local Native community -- of all heritage resources within the study area be carefully assessed during further development planning. As far as possible ethnic significance must be evaluated and expressed in terms of the value system of the ethnic community involved. Of particular importance, **the cultural** context of a site or complex of sites must be addressed when evaluating ethnic significance and formulating management strategies.

8.0 REFERENCES CITED

- Albright, S. and L. Ham
1983 **Genstar** Special Wastes Project: Detailed Impact Assessment of **Study Area M**; Heritage Resources. Heritage Conservation Branch Permit, No. 1983-42. prepared for **Poushinsky** Consultants Services, Vancouver.
- Albright, S., L. Ham and M. Magne
1983 **Genstar** Special Wastes Project: Heritage Resource Monitoring of Site Testing by **Golder Associates**. Report prepared for **Poushinsky** Consultants Services, Vancouver.
- Alexander, Diana
1992a Environment. In *A Complex Culture of the B. C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 47-98. U.B.C. Press, Vancouver.
- 1992b A Reconstruction of Traditional Land Use Patterns in the Mid-Fraser River Area Based on Ethnographic Data. In *A Complex Culture of the B.C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 98-176. U.B.C. Press, Vancouver.
- 1994 Ethnographic Overview of the Alkali Lake Band. Archaeological Overview of the **Central** Portion of Alkali Lake Band Traditional Territory, prepared by **Arcas** Consulting Archaeologists Ltd. Report prepared for Williams Lake Forest District.
- Alexander D., and R.G. Matson
1987 Report on the Potato Mountain Archaeological Project (1985). Report prepared for the Social Sciences and Humanities Research Council of Canada, the Heritage Conservation Branch of B.C. (Permit 1985-1 1), and the **Nemiah** Valley **Indian** Band Council.
- Alexander, Diana, Robert Tyhurst, R. G. Matson and **Linda Burnard**
1985 A Preliminary **Ethnoarchaeological** Investigation of the Potato Mountain Range and the Eagle Lake Area. Report prepared for the Heritage Conservation Branch of British Columbia (Permit No. **1984-14**), the Canadian Ethnic Studies Program, and the **Nemiah** Valley Indian Band Council.
- Alley, N.F.
1976 The Palynology and **Palaeoclimatic significance** of dated core of Holocene peat, **Okanagan** Valley, southern British Columbia. *Canadian Journal of Earth Science* **13**:1131-1144.
- Anderson, T.W.
1973 Historical Evidence of land use in a pollen profile from **Osoyoos** Lake, British Columbia. **Geological** Survey of Canada, Report of Activities, Part A, pp. 178-179, Geological Survey of Canada **Paper** 73-1, **Ottawa**.
- Annas**, R. M. and R. Coupe (Editors)
1979 **Biogeoclimatic Zones** and **Subzones of the Cariboo Forest Region**. Province of British Columbia, Ministry of Forests.
- Apland**, Brian C.
1981 Williston to Kelly Lake **500kV** transmission line heritage **resource** impact assessment. Ministerial Order 1981-25 report on file at the Archaeology Branch Library, Victoria.

References Cited Cont...

- Apland, Brian C., and Ray Kenny
1992 *British Columbia Archaeological Impact Assessment Guidelines*. Archaeology Branch, Ministry of Small Business, Tourism and Culture. Victoria.
- Arcas Associates (Arcas)
1983 C.N. Rail Railyard Expansion Project, Heritage Mitigation Study, Kamloops Junction. Report Prepared for CN Rail, Kamloops.
- 1985a Coquihalla Highway Project, Merrit to Surrey Lake, B.C. Report on file at the Archaeology Branch, Victoria.
- 1985b Excavations at the Rattlesnakes Hill Site (EeRh 61), Ashcroft, B.C. Report on file at the Archaeology Branch, Victoria.
- 1986 Coquihalla Highway Project, Surrey Lake to Kamloops, B.C. Report on file at the Archaeology Branch, Victoria.
- 1987 C.N. Rail Twin Tracking Program British Columbia: Heritage Site Inventory and Impact Assessment. Volume 1. Text. Report in progress prepared for CN Rail.
- 1988 Archaeological Investigations at the Sahhalkum Bridge Site (EeQw 30), Chase, B.C. Report on File at the Archaeology Branch, Victoria.
- Arcas Consulting Archeologists Ltd. (Arcas)
1990 Archaeological Exacavations at Sites EfQv 121, EfQv 123, and EfQv 133 near Squilax, B.C. Report on file at the Archaeology Branch, Victoria.
- 1994 Scheidam Flats Archaeological Resources Inventory. Report in progress.
- Armstrong, J.E., and R.J. Fulton
1965 *International Association for Quaternary Research VIlth Congress, Guidebook for Field Conference J, Pacific Northwest*, edited by C.B. Schultz and H.T. Smith, pp. 87-98.
- Bailey, J., I. Franck, P. Merchant, M. Rousseau, K. Russell, S. Woods and R. Schulting
1993 The 1992 Archaeological Investigations at the Botticelli Creek Site (EfQw 21), Adams lake., South-Central B.C. Report on file at the Archaeology Branch, Victoria.
- Baker, James
1990 Archaeological Research Concerning the Origins of the Okanagan People. In *Okanagan Sources*, edited by Jean Webber and the En'owkin Centre. Theytus Books, Penticton, B.C.
- Balf, Mary
1978 *The Dispossessed: Interior Indians in the 1800's*. Kamloops Museum, Kamloops.
- Banfield, A.W.F
1974 *The Mammals of Canada*. National Museum of Natural Science, National Museums of Canada. University of Toronto Press, Toronto.

References Cited Cont...

- Beil, Charles E., Roy L. Taylor, and Geraldine A. **Guppy**
 1976 **The Biogeoclimatic** Zones of British Columbia. *Davidsonia* 7(4):44-55.
- Beime, P.D. and D.L. Pokotylo
 1979 Hat Creek Project. Report Prepared for B.C. Hydra and Power Authority.
- Blake, T. **M.**
 1974 The Explanation of Late **Prehistoric** Settlement Pattern Variation **in** the Thompson and Fraser River Valleys, British Columbia. *BC Perspectives* 5:1-17.
- 1976 **The** Rocky Point Site (**EdQx** 20); Spatial Analysis and Descriptive Report. *Occasional Papers of the Archaeological Sites Advisory Board of British Columbia* 2, Victoria.
- Blake, T. M. and M. **Eldridge**
 1971 Final Report on the Excavation of **Pemberton** Village, **EeQx** 2. Report on file at the Archaeology Branch, Victoria.
- Boas, F.
 1891 The Shuswap. Second General Report on **the** Indians of British Columbia, Sixth Report of the Committee on the North-Western Tribes of Canada. *In Report of the 60th Meeting of the British Association for the Advancement of Science, Newcastle-Upon-Tyne, 1890, Part IV:632-647.*
- 1896 The **Tinneh** of **Nicola** Valley. Fifth General **Report** on the Indians of British Columbia, Tenth Report of the Committee on the North-Western Tribes of Canada. *In Report of the 65th Meeting of the British Association for the Advancement of Science, Ipswich, 1895, Part II:551-555.*
- 1908 **On** the **Basketry** of the Shuswap Indians. *Memoirs of the American Museum of Natural History*, 4, The *Jesup North Pacific Expedition*, 2: 292-300.
- Bouchard** Randy and Dorothy I.D. Kennedy (editors)
 1977 **Lillooet** Stories. *Sound Heritage* VI(1):1-78. Provincial **Archives** of British Columbia, Victoria.
- 1979 *Shuswap Stories: Collected 1971-1975. CommCept*, Vancouver.
- 1984 Indian History and Knowledge of the **Similkameen** River -Palmer Lake Area. **Report** prepared for the U.S. Army **Corp** of Engineers.
- 1985 Indian Land **Use** and the Indian History of the Stein River Valley, British Columbia. Report submitted to I.R. Wilson Consultants Ltd. and BC Forest Products.
- 1990 Shuswap Indian Use of the **Squialx** Area. Appendix I. In Archaeological Excavations at Sites **EfQv121, EfQv123, and EfQv133 near Squialx**, B.C., by T. **Richards** and A **Stryd**, Report on file, Archaeological Branch, Victoria pp. 239-321
- Boyd, Robert
 1985 The Introduction of Infectious Diseases Among the Indians of **the** Pacific Northwest, 1774-1874. Unpublished Ph.D. dissertation, Department of Anthropology, University of Washington.

References Cited Cont...

- Brayshaw, T.C.
1970 The Dry Forests of Southern British Columbia. *Syesis* 3: 17-43.
- Brolly, R.P.
1981 Report of the 1981 Southern Interior Survey: Final Report on the Heritage Impact Assessments in the Thompson-Okanagan and Kootenay Resource Management Regions for the Heritage Conservation Branch.
- Brown, B. and G. Lundborg
1977 Archaeological Resources of the Lower Adams River. Report submitted to the Provincial Archaeologist's Office, Heritage Conservation Branch, Victoria.
- Bussey, Jean and Diana Alexander
1992 Archaeological Assessment of the Cariboo Forest Region. None permit on file at the Archaeology Branch Library, Victoria.
- 1994 Mount Revelstoke and Glacier National Parks Prehistoric Archaeological Site Assessment. Report prepared for the Archaeological Services, Parks Canada Service, Western Region, Calgary.
- Cannon, Aubrey
1992 Conflict and Salmon on the Interior Plateau of British Columbia. In *A Complex Culture of the B.C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 506-524. U.B.C. Press, Vancouver.
- Carl, G. C., W. A. Clemens, and C. C. Lindsey
1959 *The Fresh-Water Fishes of British Columbia*, Handbook of the B.C. Provincial Museum, No. 5, Victoria.
- Carlson, c.
1980 The Curr Site (EdRa 22). In *The Archaeology of Kamloops*, edited by R.L. Wilson and C. Carlson, pp. 87-125. Department of Archaeology, Simon Fraser University, Publication No. 7. Simon Fraser University, Burnaby.
- Caron, Mabel
1986 *Shuswap Homes*. Secwepemc Cultural Education Society, Kamloops.
- Cawker, K.B.
1978 Historical Dynamics of *Artemisia tridentata* Nuttali in southern British Columbia. Unpublished Ph.D. Thesis, Simon Fraser University, Burnaby.
- Cowan, I. McT. and C. J. Guiguet
1975 *The Mammals of British Columbia*. B.C. Provincial Museum Handbook, No. 11. Queen's Printer, Victoria.
- Chisholm, Brian S.
1986 *Reconstruction of Prehistoric Diet in British Columbia Using Stable-Isotopic Analysis*. Unpublished Ph.D. dissertation, Department of Archaeology, Simon Fraser University, Burnaby, B.C.
- Clague, John J.
1981 Late Quaternary Geology and Geochronology of British Columbia Part 2: Summary Discussion of Radiocarbon Dated Quaternary History. *Geological Survey of Canada Paper* 80-35.

References Cited Cont...

Comer, J.

1968 *Pictographs in the Interior of B. C.* Wayside Press, Vernon.

Curtis, Edward S.

1911 **Salishan** Tribes of the Interior. In *North American Indian*, &:43-114, 162-166, 179-189. Norwood.

Cybulski, J.S., D.E. Howes, J.C. Haggarty, and M. Eldridge

1981 An Early **Human** Skeleton from South-Central British Columbia: Dating and **Bioarchaeological** Inference. *Canadian Journal of Archaeology* 5:49-60.

Dawson, George W.

1892 Notes on the Shuswap People of British Columbia. In *Proceedings and Transactions of the Royal Society of Canada*, 9(2)3-44.

Drake-Terry, Joanne

1989 *The Same as Yesterday: The Lillooet Chronicle the theft of their Lands and Resources*. Lillooet Tribal Council, Lillooet.

Duff, Wilson

1969 *The Indian History of British Columbia: Volume 1, The Impact of the White Man. Anthropology in B.C., Memoir No. 5*, Victoria.

Eldridge, Anne

1982 **Cambium** Resources of the Pacific Northwest: An Ethnographic and Archaeological Study. Unpublished Ms. in possession of author.

Eldridge, M.

1974 Recent Archaeological Investigations near Chase, B.C. *Cariboo College Papers in Archaeology* No. 2.

Environment Canada

1976 Map of Land Capability for Wildlife: Ungulates and Waterfowl, **Ministry** of the Environment, Ottawa.

Ferguson, A. and G. Osborn

1981 Minimum Age of **Deglaciation** of Upper Elk Valley, British Columbia. *Canadian Journal of Earth Science* 18:1635-1636.

Fradmark, K.

1969 Archaeological Sites in the **Shuswap** - South Thompson River **Area**, B.C. Report prepared for the **Heritage** Conservation Branch, Victoria.

Fulton, R.J.

1965 Silt Deposition in **Late-Glacial Lakes** of Southern British Columbia. *American Journal of Science*, Vol 263 pp. 553-570.1967 *Deglaciation Studies in Kamloops Region. An Area of Moderate Relief, British Columbia*. Department of Energy, Mines and Resources, Ottawa.1969 *Glacial Lake History, Southern Interior Plateau, British Columbia*. Department of Energy, Mines and Resources, Ottawa.

References Cited Cont...

- Fulton, R.J. and G.W. Smith
1978 Late Pleistocene **Stratigraphy** of south-central British Columbia. *Canadaian Journal of Earth Sciences* Vol. 15, No. 1, pp 971-980.
- Godfrey, W.E.
1966 *The Birds of Canada*. Bulletin of the National *Museum of Canada*, No. 203, Ottawa.
- Goldman, I.
1953 The **Alkatcho Carrier** of British Columbia. Unpublished Ms. **on file** with the British Columbia Provincial Museum.
- Ham, Leonard C.
1975 **Shuswap** Settlement Patterns. Unpublished M.A. Thesis, Department of Archaeology, Simon Fraser University, Bumaby.
- Hayden, Brian
1985 Preliminary Archaeological and **Ethnoarchaeological Land** Use Assessment of Cornwall **Creek**, Southwestern British Columbia. Ms. in possession of author.
- Hebda, Richard J.
1982 A 13,000 year record of vegetation, Hat Creek Valley, **southcentral** British Columbia. Abstracts, **American Quaternary Association Seventh** Biennial Conference, Seattle.
1983 Postglacial History of Grasslands of Southern British Columbia and Adjacent Regions. **In** *Grassland Ecology and Classification Symposium Proceedings*, Nicholson, A.C., A. **Mclean** and T.E. Baker, Eds. 1983, B.C. pp. 156- 191. Ministry of Forests, Victoria.
- Heritage Conservation Branch
1994 **Cultural** Heritage Resource Inventory System (CHRIS): Guide to CHRIS Fields. Version 2.4, June 1994. Heritage Conservation Branch, Ministry of Small Business, Tourism and Culture, Victoria.
- Hill-Tout, C.
1900 Notes **on the N'tlaka'pamuQ** of British Columbia: A Branch of the Great **Salish** Stock of North America. *In Report of the 69th Meeting of the British Association for the Advancement of Science*, Dover, 1899, pp. 500-584.
1907 *The Far West: the Home of the Salish and Dene. In British North America, Volume I*. Archibald Constable, London.
1978 *The Salish People, Volume I: The Thompson and Okanagan*, edited by Ralph **Maud**. Talonbooks, Vancouver, B.C.
- Hudson, Douglas
1990 The **Okanagan** Indians of British Columbia. **In** *Okanagan Sources*, edited by Jean **Webber** and the **En'owkin Centre**. Theytus Books, **Penticton**, B.C.
- Johnson-Fladmark, S.
1973 **Shuswap Lakes** Archaeological Project. Report **on file** at the Archaeology Branch, Victoria.

References Cited Cont...

Jorgensen, J. S.

1980 *Western Indians*. W. H. Freeman, San Francisco.

Keddie, G.

1971 Surveys of Wells Grey Provincial Park and Upper Fraser-Rocky Mountain Trench. Report on file at the Archaeology Branch.

Kennedy D.I.D. and Randy Bouchard

1985 Indian History and Knowledge of the Merritt to Surrey Lake Area. Io Coquihalla Highway Project, Merritt Bypass to Surrey lake, B.C.: Detailed Heritage Resource Inventory and Impact Assessment, by Stephen Lawhead, Appendix I. Report prepared for the Heritage Conservation Branch, Victoria.

1987a Notes on Sahhalkum Ethnography and History. Report prepared for Arcas Associates, Port Moody, B.C.

1987b Indian History and Knowledge of the Aspen Grove to Peachland Corridor of the Coquihalla Highway. Appendix II in, Coquihalla Highway Project: Merritt to Peachland, B.C.: Detailed Heritage Resource Inventory and Impact Assessment. Report prepared for the Heritage Conservation Branch (Permit 1986-15) and the Ministry of Transportation and Highways, Victoria, B.C.

Kennedy D.I.D. and Randy Bouchard cont...

1992 Stl'atl'imx (Fraser River Lillooet) Fishing. In *A Complex Culture of the B.C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 266-354. U.B.C. Press, Vancouver.

Kew, Michael

1992 Salmon Availability, Technology, and Cultural Adaptation in the Fraser River Watershed. In *A Complex Culture of the B. C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 177-221. U.B.C. Press, Vancouver.

King, M.

1980 Palynological and Macrofossil Analysis of Lake Sediments from the Lillooet Area, British Columbia. M.Sc. Thesis. Simon Fraser University, Burnaby, B.C.

Krajina, V.J.

1965 Biogeoclimatic Zones and Classification of British Columbia. *Ecology of Western North America 1:1-17*. University of British Columbia, Botany Department, Vancouver.

Laforet, Andrea and Annie York

1981 Notes on the Thompson Winter Dwelling. In *The World is as Sharp as a Knife: An Anthology in Honour of Wilson Duff*, edited by D. Abbott, pp. 115-122. B.C. Provincial Museum, Victoria.

Lane, R.

1953 *Cultural Relations of the Chilcotin of West Central British Columbia*. Unpublished Ph.D. dissertation, University of Washington, Seattle.

1981 Chilkotin. In *Subarctic*, edited by June Helm, pp. 402-412. Handbook of North American Indians, vol. 6. Smithsonian Institution, Washington, D.C.

References Cited Cont...

- Lovell, N. C., B. S. Chisolm, D. E. Nelson, and H. P. Schwarcz
 1986 Prehistoric Salmon Consumption in Interior British Columbia. *Canadian Journal of Archaeology*, Vol. 10:99-106.
- Martin, K., and M. Robinson
 1972 System "E" Survey, 1972 ■ Comprising: Wells Gray Provincial Park, Bowron Lakes Provincial park and Upper Fraser River District. Report prepared for the Archaeological Sites Advisory Board, Victoria.
- Mathews, W.H.
 1944 Glacial Lakes and ice retreat of south-central British Columbia: Royal Society of Canada Transactions, third series, vol. 38, pp. 39-57.
- Mathews, Rolf W.
 1978 The Environment and Biotic Resources of the Lillooet Area. In *Reports of the Lillooet Archaeological Project*, No. 1: *Introduction* and Setting, edited by A.H. Stryd and S. Lawhead, pp. 68-99. Paper of the Archaeological Survey of Canada, No. 73, Mercury Series. National Museum of Man, Ottawa.
- 1985 Paleobotanical Evidence for Climatic Change in Southern British Columbia During Late-Glacial and Holocene Time. In *Climatic Change in Canada 5: Critical Periods in the Quaternary Climatic History of Northern North America*, edited by C.R. Harrington. *Syllogeus* 55:344-396.
- Mathews, R.W. and G.E. Rouse
 1975 Palynology and paleoecology of post glacial sediments from the Lower Fraser River Canyon of British Columbia. *Canadian Journal of Earth Sciences* 12:745-756.
- Mellows, Carol A.
 1990 The Clash of Cultures: 1800 to 1858. In *Okanagan Sources*, edited by Jean Webber and the En'owkin Centre. Theytus Books, Penticton, B.C.
- Merchant, P.S., I. Franck, S. Woods, M. Rousseau and R. Schulting
 1994 The 1992 Archaeological Investigations at the Woolford Point Site (EfQw 2), Adams Lake, South-Central B.C. Report on file at the Archaeology Branch, Victoria.
- Mitchell, W. R. and R. E. Green
 1981 *Identification and Interpretation of Ecosystems of the Western Kamloops Forest Region*. Province of British Columbia, Ministry of Forests, Victoria.
- Mohs, G.
 1978 Heritage Resources of the South Thompson River Valley: Inventory, Interpretation and Evaluation. Prepared for the Heritage Conservation Branch, Victoria.
- 1980 Shuswap Planning Study: The Heritage Resources of the Western Shuswap Basin. Report prepared for the Heritage Conservation Branch, Victoria.
- 1981 An Assessment and Evaluation of Heritage Resources in the South Thompson River Valley of British Columbia. Heritage Conservation Branch, *Occasional Papers* 8.

References Cited Cont...

Morice, A.

- 1894 Notes Archaeological, Industrial, and Sociological on the Western **Denes**. *Transactions of the Canadian Institute, Session 1892-1893*, Vol.4:1-222.

Muckle, R.J.

- 1987 Heat, Rattlesnakes, and Heritage Sites: The 1987 **Skeetchestn** Indian Band Archaeological Project. Report prepared for the **Skeetchestn** Indian Band, Box 178, **Savona**, B.C.

Nastich, Milena

- 1954 The **Lillooet**: An Account of the Basis of Individual Status. Unpublished M.A. Thesis, Department of Economics, Political Science and Sociology, University of British Columbia, Vancouver.

Nelson, D. E. and G. Will

- 1976 Obsidian Sources in the **Anahim** Peak Area. Current Research Reports (R. L. **Carlson**, editor). Simon Fraser *University Publication Number* 3. Department of Archaeology, pp. 151-154.

Ormsby, Margaret

- 1958 *British Columbia: A History*. MacMillan, Toronto.

Palmer, G.

- 1975a Shuswap Indian **Ethnobotany**. *Syesis* 8:25-81.

- 1975b Cultural Ecology in the Canadian Plateau: Pre-Contact to Early Contact in the Territory of the Southern **Shuswap** Indians of B.C. *Northwest Anthropological Research Notes* 9:199-245.

Pokotylo, D.L.

- 1977 Archaeological resources in the **Clinton-Ashcroft** area, B.C.: An Initial Evaluation. In Annual *Report for the year 1975: Activities of the Archaeological Sites Advisory Board of B. C., and Selected Research Reports*. Edited by B. **Simonsen**, pp.10-45. Heritage Conservation Branch, Victoria.

- 1978 Lithic technology and settlement patterns in the Upper Hat Creek Valley, B.C. Unpublished Ph.D. dissertation, Department of Anthropology and Sociology, University of British Columbia, Vancouver.

Pokotylo, D. and P. **Froese**

- 1983 Archaeological Evidence for Prehistoric Root Gathering on the **Southern** Interior Plateau of British Columbia: A case study from Upper Hat Creek Valley. *Canadian Journal of Archaeology* 7(2):127-157.

Post, Richard H.

- 1938 **The** Subsistence Quest. In *The Sinkaietk or Southern Okanagan of Washington*, edited by Leslie Spier. General Series in Anthropology, No. 6, George **Banta** Publishing, **Menasha**, Washington, pp. 11-34.

Post, Richard H. and Rachel S. Commons

- 1938 Material Culture. In *The Sinkaietk or Southern Okanagan of Washington*, edited by Leslie **Spier**. General Series in Anthropology, No. 6, George **Banta** Publishing, **Menasha**, Washington, pp. 35-70.

Ray, V.F.

- 1936 Native Villages and Groupings of the Columbia Basin. *The Pacific Northwest Quarterly*, Vol. XXVII, pp. 99-152.

References Cited Cont...

Ray, V.F. cont...

1939 Cultural Relationships in the Plateau of North-western America. In *The Southwest*, Publications of the Frederick Webb *Hodge Anniversary Publication* Fund, Volume 3. **Los Angeles**.

1942 Culture element distributions, XXII: Plateau. *University of California, Anthropological Records*, 8(2)99-257.

Richards, T., and M.K. Rousseau

1982 Archaeological **Investigations on Kamloops** Indian Reserve Number 1, **Kamloops**, British Columbia. Report on file at the Archaeology Branch.

1987 *Late Prehistoric Cultural Horizons on the Canadian Plateau*. Department of Archaeology, Simon Fraser University, Publication Number 16. **Burnaby**

Robbiis, Chandler S., **Bertel Bruun**, and Herbert S. Zim

1966 *Birds of North America: A Guide to Field Identification*. Golden Press, New York.

Romanoff, Steven

1992 The Cultural Ecology of Hunting and Potlatches Among the **Lillooet** Indians. In *A Complex Culture of the B.C. Plateau: Traditional St'at'imx Resource Use*, edited by Brian Hayden, pp. 470-505. U.B.C. Press, **Vancouver**.

n.d. The **Lillooet** Hunter. Unpublished Ms. in possession of the author.

Rousseau, Mike K.

1989 Results of the **Keatley** Creek Archaeological Project Lithic Source Study: 1988 and 1989 Field Seasons. Unpublished Ms. in possession of author.

1994 Early Prehistoric Occupation of South-Central British Columbia: A Review of the Evidence and Recommendations for **Future** Research. *EC Studies No. 99* pp. 140-183.

Rousseau, Mike K., **J. Breffitt**, **G. Guthrie**, and D.G. Howe

1989 The 1988 Results of Archaeological Investigations in Upper Oregon Jack **Creek** Valley and on Cornwall Hills Summit **near Ashcroft**, B.C. Report Prepared for the B.C. Heritage **Trust**, Victoria.

Rousseau, **Mike K.**, **P. Friele**

1986 An Inventory, Evaluation, and Impact Assessment of Heritage Resources **within Ashcroft** Indian Reserves 2, 3 and 4, in **the** Thompson River Valley of South-Central British Columbia. Prepared **for** The **Ashcroft** Indian Band. Report on file at the Archaeology Branch, Victoria.

Rousseau, Mike K., **R. Gargett**, and **P. Friele**

1987 Cornwall Hills Summit Heritage Project: Site Inventory and Test Excavation Results. Report Prepared for the B.C. **Heritage** Trust, Victoria.

Rousseau, Mike **K.**, and G. Howe

1987 **Scheidam** Flats: A Prehistoric Root Roasting **Area** Near Kamloops. *The Midden* 19(2):7-10.

References Cited Cont...

- Rousseau, Mike K., and Robert J. Muir
 1992 **Archaeological** Investigations at the Ducks Meadow **Quarry** Site, Monte **Creek Valley**, South-Central B.C. **Permit** 199169 report on file at the Archaeology **Branch** Victoria.
- Rousseau, Mike K., R. Muir, D. Alexander, J. **Breffitt, S.** Woods, K. **Berry,** and Tina Van Gaalen
 1991 **Results** of the 1989 Archaeological Investigations Conducted in the Oregon Jack Creek **Locality**, Thompson River Region, South-Central British Columbia. Report Prepared for the B.C. Heritage **Trust**, Victoria.
- Rousseau, Mike K., and T. Richards
 1980 **The** 1980 **Thompson-Okanagan-Kootenay** Impact Assessment Project: Final Report. **Report** on File at the Heritage Conservation Branch, Victoria.
- Rousseau, Mike K., and I. **Sumpter**
 1983 An Impact Assessment of Heritage Resources **within** the Proposed C.N.R. Rail Yard Expansion, **Kamloops** Indian **Reserve** No. 1, **Kamloops**, B.C. Report on file at the Archaeology Branch, Victoria.
- Sanger, D.**
 1967 **Prehistory** of the Pacific Northwest **as seen** from the Interior of British Columbia. *American Antiquity*, 32(2): 187-197.
- Sendey, J.**
 1912 Preliminary Report of Excavations at Site **EfQu** 3, **Shuswap** Lake Provincial park, 1971. Report on file at the Archaeology Branch, Victoria.
- Simonsen, B.**
 1972 Final Report of the System "E" Archaeological Resources **Evaluation Project** • 1971-1972. Report on File at the Archaeology Branch, Victoria.
- Smith, **Allan H.**
 1988 **Lower Thompson.** In *Ethnography of the North Cascades*, by A. H. Smith, pp. 145-240. Center for **Northwest** Anthropology, Washington State University, Project Report No. 7, Pullman, Washington.
- Smith, H.I.
 1899 Archaeology of **Lytton**, British Columbia. In *Memoir of the American Museum of Natural History, Jesup North Pacific Expedition*, 1(31):129-163. New York.
- 1900 Archaeology of the Thompson River Region, British Columbia. In *Memoir of the American Museum of Natural History, Jesup North Pacific Expedition*, 2(1):401-442. New York.
- 1901 The Archaeology of the Southern **Interior** of British Columbia. *The American Antiquarian*, vol 23, pp. 25-31.
- Smyly, John**
 1973 **The Shuswap Kekuli.** *The Beaver* 303(4):49-51.
- Spaulding, David J.**
 1990 The Early History of Moose (**Alces alces**): Distribution and Relative Abundance **in** British Columbia. *Contributions to Science, Royal British Columbia Museum, Number II*. Victoria.

References Cited Cont...

Spier, Leslie (editor)

- 1938 ***The Sinkaietk or Southern Okanagan of Washington. General Series*** in Anthropology, No. 6, George Banta Publishing, Menasha, Washington, pp. 133-176.

Steedman, E.V.

- 1930 **Ethnobotany** of the Thompson Indians of British Columbia. ***45th Annual Report of the Bureau of American Ethnology*** 46(1927-28):447-552.

Surtees, Ursula

- 1974 Building a Winter Dwelling. In ***Lak-lahai-ee Shuswap Indian Meaning "to tell"***. Volume 2. Kelowna Museum, Kelowna, B.C.

Teit, James

- 1895 Excerpt from a letter from James Teit to **Franz** Boas at the American Museum of Natural History.
- 1898 Traditions of the Thompson River Indians of British Columbia. ***Memoirs of the American Folk-Lore Society*** 4:1-137.
- 1900 The Thompson Indians of British Columbia. In ***Memoir of the American Museum of Natural History, Jesup North Pacific Expedition, 1(4):*** 163-392. New York.
- 1906 The Lillooet Indians. In ***Memoir of the American Museum of Natural History, Jesup North Pacific Expedition, 2(5):***193-300. New York.
- 1909 **The Shuswap.** In ***Memoir of the American Museum of Natural History, Jesup North Pacific Expedition, 2(7):***447-789. New York.
- 1912 ***Mythology of the Thompson Indians.*** G.E. Stechert, New York.
- 1917 Thompson Tales. In ***Folk-Tales of Salishan Tribes. Memoirs of the American Folk-Lore Society*** 11: 1-64.
- 1930a ***The Salishan Tribes of the Western Plateaus***, edited by F. Baas. Extract from the Forty-fifth **Annual** Report of the Bureau of American Ethnology, Washington.
- 1930b Tattooing and Face and Body Painting of the Thompson Indians, British Columbia. ***45th Annual Report of the Bureau of American Ethnology***, 1927-28, pp. 397-439.
- 1937 More Thompson Indian Tales. ***Journal of American Folk-Lore*** 50:173-190.
- 1979 Notes **on the Early History of the Nicola Valley**. Reprint of the National Anthropological Archives, B.A.E. MS. No. 4581. Nortorf, West Germany.
- Turner, N.J.
- 1992 Plant Resources of the **Stl'atl'imx** (Fraser River **Lillooet**) People: A Window into the Past. In ***A Complex Culture of the B.C. Plateau: Traditional Stl'atl'imx Resource Use***, edited by Brian Hayden, pp. 405-469. U.B.C. Press, Vancouver.

References Cited Cont...

Turner, N.J., Randy **Bouchard**, and D.I.D. **Kennedy**

1980 **Ethnobotany** of the **Okanagan-Colville** Indians of British Columbia and Washington. *Occasional Papers of the British Columbia Provincial Museum*, No. 21, Victoria.

Turner, N. J., Laurence C. Thompson, M. Terry Thompson, and Annie Z. York

1990 **Thompson Ethnobotany: Knowledge and Usage of Plants by the Thompson Indians of British Columbia**. Memoir of the Royal B.C. Museum, No. 3. Victoria, B.C.

Tyhurst, Robert

n.d. The Chilcotin: An Ethnographic History. Unpublished Ms. in possession of the author.

1992 Traditional and Contemporary Land and Resource Use by **Ts'kw'aylaxw** and **Xaxli'p** Bands. In *A Complex Culture of the B.C. Plateau: Traditional Stl'atl'imx Resource Use*, edited by Brian Hayden, pp. 355-404. U.B.C. Press, Vancouver.

Walters, L.V.W.

1938 Social Structure. In *The Sinkaietk or Southern Okanagan of Washington*, edited by Leslie **Spier**. General Series in **Anthropology**, No. 6, George **Banta** Publishing, **Menasha**, Washington, pp. 71-99?

Warner, E.J.

1980 Heritage Resource Inventory and Impact Assessment of the Proposed Kelly **Lake-Nicola** and **Nicola-Merritt-Highland** Transmission Lines in Southern-Central British Columbia. Report Prepared for B.C. **Hydro** and Power Authority, Vancouver.

1982 Heritage Resource Inventory and Impact Assessment Kelly Lake - **Nicola** Transmission Line, Hat Creek Bypass Segment, **South** central B.C. Report Prepared for B.C. **Hydro** and Power Authority, Vancouver.

Weber, C., and B. Seymour]

1976 Archaeological Survey along two Proposed **Hydro** Transmission Line Routes in the South-Central Interior of B.C., 1976. Report submitted to the **Archaeological** Sites Advisory Board, Victoria.

Whitehead, Margaret

1981 *The Cariboo Mission: A History of the Oblates*. Sono Nis Press, Victoria.

Wilson, I.R., B. Smart, N. Heap, J. Warner, T. **Ryals**, S. Woods, and S. **Macnab**

1992 **Excavations** at the Baker Site **EdQx** 43, Monte Creek, Permit **91-107**. Report on file at the Archaeology Branch, Victoria.

Wilson, R.L.

1980 Archaeological Investigations near **Kamloops**. In *The Archaeology of Kamloops*, edited by R.L. Wilson and C. **Carlson**, pp. 1-83. Department of Archaeology, Simon **Fraser** University, Publication No. 7, Simon Fraser University, **Bumaby**.

Wilson R.L. cont...

1983 Heritage Resource Investigations of the Mid-North Thompson River Region, British Columbia. **North** Thompson River Archaeological Project Report No. 2. Prepared for the **North** Thompson Indian Band, **Barriere**, and the Heritage **Conservation** Branch, Victoria.

Appendix 1. Definition of Ethnographic Site Types

Wiiter village: A **semi-permanent** winter residence with **pithouses or** (less commonly) dwelling lodges. Villages were typically built on the terraces of the major salmon-bearing rivers and lakes.

Basecamp: A temporary residential camp used **by** families or task groups. **Basecamps** were established **in** close proximity to one or more important resource localities which task groups exploited by **travelling** to the locality, procuring the resource, and returning to the **basecamp** for final processing of **the** resource.

Resource Procurement Location: A place, where a **resource** was gathered or captured. These locations include plant gathering sites, hunting **blinds**, hunting fences, hunting drive sites, game look-outs, and kill and/or butchering sites.

Transit **camp:** **Temporary camps used by individuals,** task groups, or families **while travelling** between **basecamps** or between **a basecamp** (or village) and **a resource** procurement location. Transit camps used only briefly during the day are referred to as short-tam, **while** those used **over** one or **two** nights are called long-term.

Burial: A location used only for burying the **dead**. Burials were most commonly located **near** the villages.

Quarry: A location where suitable raw material was collected for the manufacture of stone tools.

Pictograph: A rock face where Native people have painted images.

Petroglyph: A rock face where Native people have pecked images.

Appendix 2. A List of Mammals Used by Natives in the Kamloops Forest District

This is a list of mammals that currently occur or previously may have existed in the Kamloops Forest District and are known to have been used by the Shuswap, Thompson, and Okanagan-Colville. Nomenclature for these animals follows Cowan and Guiguet (1965) and Banfield (1974). * Indicates limited distribution in KFD.

bear, black (*Ursus americanus*)
 bear, grizzly (*Ursus arctos horribilis*)
 beaver (*Castor canadensis*)
 bobcat (*Lynx rufus fasciatus*)
 caribou (*Rangifer tarandus montanus*)*
 chipmunk (*Eutamias amoenus*)
 cougar (*Felis concolor*)
 coyote (*Canis latrans lestes*)
 deer, mule (*Odocoileus hemionus hemionus*)
 deer, whitetail (*Odocoileus virginianus*)*
 elk (*Cervus canadensis nelsoni*)*
 fisher (*Martes pennanti columbiana*)*
 ground squirrel, Columbian (*Spermophilus columbianus*)*
 hare, snowshoe (*Lepus americanus*)
 lynx (*Lynx canadensis canadensis*)
 marten (*Martes americana*)
 marmot, hoary (*Marmota caligata*)*
 marmot, yellow-bellied (*Marmota flaviventris avara*)*
 mink (*Mustela vison energumenos*)
 moose (*Alces alces andersoni*)
 mountain goat (*Oreamnos americanus*)*
 muskrat (*Ondatra zibethica*)
 packrat (*Neotoma cinerea occidentalis*)
 pika (*Ochotona princeps*)*
 porcupine (*Erethizon dorsatum nigrescens*)
 red fox (*Vulpes fulva*)
 sheep, bighorn (*Ovis canadensis*)*
 skunk (*Mephitis mephitis hudsonica*)
 snowshoe hare (*Lepus americanus pallidus*)
 squirrel, northern flying (*Glaucomys sabrinus*)
 squirrel, red (*Tamiasciurus hudsonicus*)
 weasel, long-tailed (*Mustela frenata*)
 weasel, short-tailed (*Mustela erminea richardsoni*)
 wolf (*Canis lupus*)
 wolverine (*Gulo luscus luscus*)
 yellow badger (*Taxidea taxus taxus*)

Appendix 3. A List of Birds Used by Natives in the Kamloops Forest District

This is a list of birds that currently **breed** or migrate through the Kamloops Forest District and were probably used by the Shuswap, Thompson, and Okanagan-Colville. The scientific and common names listed below follow Robbins, Bruun, and Zim (1966) and Godfrey (1966).

swans

whistling swan (*Olor columbianus*)

trumpeter swan (*Olor buccinator*)

Geese

Canada goose (*Branta canadensis*)

snow goose (*Chen hyperborea*)

Ducks

mallard (*Anas platyrhynchos*)

pintail (*Anas acuta*)

gadwall (*Anas strepera*)

American widgeon (*Mareca americana*)

shoveler (*Spatula clypeata*)

blue-winged teal (*Anas discors*)

cinnamon teal (*Anas cyanoptera*)

green-winged teal (*Anas carolinensis*)

redhead (*Aythya americana*)

canvasback (*Aythya valisineria*)

ring-necked (*Aythya collaris*)

greater **scaup** (*Aythya marila*)

lesser **scaup** (*Aythya affinis*)

common goldeneye (*Bucephala clangula*)

Barrow's goldeneye (*Bucephala islandica*)

bufflehead (*Bucephala albeola*)

harlequin (*Histrionicus histrionicus*)

white-winged **scoter** (*Melanitta deglandi*)

ruddy duck (*Oxyura jamaicensis*)

Other Wetland Birds

common loon (*Gavia immer*)

western grebe (*Aechmophorus occidentalis*)

red-necked grebe (*Podiceps grisegena*)

horned grebe (*Podiceps auritus*)

eared grebe (*Podiceps caspicus*)

pied-billed **grebe** (*Podilymbus podiceps*)

least grebe (*Podiceps dominicus*)

common merganser (*Mergus merganser*)

red-breasted merganser (*Mergus serrator*)

hooded **merganser** (*Lophodytes cucullatus*)

Grouse

blue **grouse** (*Dendragapus obscurus*)

spruce grouse (*Canachites canadensis*)

ruffed grouse (*Bonasa umbellus*)

sharp-tailed grouse (*Pedioecetes phasianellus*)

Eagles

golden eagle (*Aquila chrysaetos*)

bald eagles (*Haliaeetus leucocephalus*)

Owls

barred owl (*Strix varia*)

great horned owl (*Bubo virginianus*)

short-eared owl (*Asio flammeus*)

snowy owl (*Nyctea scandiaca*)

great gray owl (*Strix nebulosa*)

boreal owl (*Aegolius funereus*)

saw-whet owl (*Aegolius acadicus*)

pygmy owl (*Glaucidium gnoma*)

Other Birds

willow ptarmigan (*Lagopus lagopus*)

white-tailed ptarmigan (*Lagopus leucurus*)

red-shafted flicker (*Colaptes cafer*)

pileated woodpecker (*Dryocopus pileatus*)

sandhill crane (*Grus canadensis*)

great blue heron (*Ardea herodias*)

mourning dove (*Zenaidura macroura*)

robin (*Turdus migratorius*)

varied thrush (*Ixoreus naevius*)

magpie, black-billed (*Pica Pica*)

Appendix 4. A List of Fish Used by Natives in the Kamloops Forest District

This is a list of fish that currently occur in the Kamloops Forest District and are known to have been used by the Shuswap, Thompson, and Okanagan-Colville. The taxonomy used below is based on Carl et al. (1959).

burbot (*Lota lota*)
chub, **lake** (*Couesius plumbeus*)
dolly **varde**n (*Salvelinus malma*)
northern **squawfish** (*Ptychocheilus oregonensis*)
peamouth chub (*Mylocheilus caurinus*)
salmon, **coho** (*Oncorhynchus kisutch*)
salmon, pink (*Oncorhynchus gorbuscha*)
salmon, **spring** (*Oncorhynchus tshawytscha*)
salmon, sockeye (*Oncorhynchus nerka*)
sculpin, prickly (*Cottus asper*)
sucker, **bridgelip** (*Catostomus columbianus*)
sucker, **largescale** (*Catostomus macrocheilus*)
sucker, **longnose** (*Catostomus catostomus*)
sucker, **northern** mountain (*Catostomus platyrhynchus*)
steelhead (see **trout**, rainbow)
trout, **cutthroat** (*Salmo clarki clarki*)
trout, **lake** (*Salvelinus namaycush*)
trout, rainbow (*Salmo gairdneri*)
whitefish, **mountain** (*Prosopium williamsoni*)
whitefish, pygmy (*Prosopium coulteri*)

Appendix 5. A List of Plants Used by Natives in the Kamloops Forest District

This is a list of plants that currently occur in the Kamloops Forest District and are known to have been used by the Shuswap, Thompson, and Okanagan-Colville. The scientific and common names listed below are derived from Turner (1992).

alder, Sitka (*Alnus sinuata*)
 anemone, Pacific (*Anemone multifida*)
 aspen, trembling (*Populus tremuloides*)
 avalanche lily, yellow (see lily, yellow avalanche)
 balsam poplar (see cottonwood)
 balsamroot (*Balsamorhiza sagittata*)
 baneberry (*Actaea rubra*)
 birch, paper (*Betula papyrifera*)
 bitterroot (*Lewisia rediviva*)
 black tree lichen (*Bryoria fremontii*)
 blackcap (*Rubus leucodermis*)
 blueberry, dwarf mountain (*Vaccinium caespitosum*)
 blueberry, oval-leaved (*Vaccinium ovalifolium*)
 bluebunch wheat grass (see grass, bluebunch wheat)
 bulrush, round-stem (see tule)
 bunchgrass (see grass, bluebunch wheat)
 cactus, prickly-pear (*Opuntia fragilis*, *O. polyacantha*)
 cascara (*Rhamnus purshiana*)
 cattail, common (*Typha latifolia*)
 cedar, red (see cedar, western red)
 cedar, yellow (*Chamaecyparis nootkatensis*)
 cedar, western red (*Thuja plicata*)
 cherry, bitter (*Prunus emarginata*)
 cherry, choke (*Prunus virginiana*)
 chocolate lily (see lily, chocolate)
 chocolate-tips (*Lomatium dissectum*)
 choke cherry (see cherry, choke)
 cottonwood, or balsam poplar (*Populus balsamifera*)
 cottonwood mushroom (*Tricholoma populinum*)
 cow-parsnip (*Heracleum lanatum*)
 crabapple, Pacific (*Malus fusca*)
 desert parsley (*Lomatium macrocarpum*)
 devil's-club (*Oplopanax horridus*)
 Douglas-fir (see fir, Douglas-)
 elderberry, red (*Sambucus racemosa*)
 false box (*Paxistima myrsinites*)
 false onion (*Triteleia grandiflora* ?)
 false Solomon's-seal (*Smilacina racemosa*)
 field wormwood (see wormwood, field)
 fir, balsam (see fir, subalpine)
 fir, Douglas- (*Pseudotsuga menziesii*)
 fir, subalpine (*Abies lasiocarpa*)
 fireweed (*Epilobium angustifolium*)
 gooseberry, white-stemmed (*Ribes inerme*)
 gooseberry, swamp (*Ribes lacustre*)

grass, bluebunch wheat (*Agropyron spicatum*)
 grass, bunch- (see grass, bluebunch wheat)
 grass, giant wild rye (*Elymus cinereus*)
 grass, reed canary (*Phalaris arundinacea*)
 grass, pine (*Calamagrostis rubescens*)
 hawthorn, black, (*Crataegus douglasii*)
 hazelnut (*Corylus cornuta*)
 hellebore, Indian (see Indian hellebore)
 hemlock, mountain (*Tsuga mertensiana*)
 hemlock, western (*Tsuga heterophylla*)
 highbush cranberry (*Viburnum edule*)
 hog-fennel (see desert parsley)
 horsetail, branchless (*Equisetum hyemale*)
 horsetail, common (*Equisetum arvense*)
 huckleberry, black mountain (*Vaccinium membranaceum*)
 huckleberry, red (*Vaccinium parvifolium*)
 Indian celery (*Lomatium nudicaule*)
 Indian hell&ore (*Veratrum viride*)
 Indian potato (see spring beauty)
 Indian rhubarb (see cow-parsnip)
 Indian-hemp (*Apocynum cannabinum*)
 "ironwood" (see oceanspray)
 juniper, common (*Juniperus communis*)
 juniper, Rocky Mountain (*Juniperus scopulorum*)
 kinnikinnick (*Arctostaphylos uva-ursi*)
 Labrador-tea (*Ledum groenlandicum*)
 lichen, black tree (see black tree lichen)
 lily, chocolate (*Fritillaria lanceolata*)
 lily, desert (see lily, mariposa)
 lily, mariposa (*Calochortus macrocarpus*)
 lily, tiger (*Lilium columbianum*)
 lily, yellow avalanche (*Erythronium grandifloru*)
 maple, Rocky Mt. (*Acer glabrum var. douglasii*)
 mariposa lily (see lily, mariposa)
 mint, wild (*Mentha arvensis*)
 mock-orange (*Philadelphus lewisii*)
 mosses, general (espec. "long" types) (Bryophytes)
 mushroom, cottonwood (see cottonwood mushroom)
 mushroom, slimey top (unidentified)
 nettle, stinging (see stinging nettle)
 oceanspray (*Holodiscus discolor*)
 onion, nodding wild (*Allium cernuum*)
 Oregon-grape, tall (*Mahonia aquifolium*)
 pine, lodgepole (*Pinus contorta*)
 pine, ponderosa (*Pinus ponderosa*)
 pine, white (*Pinus monticola*)
 pine, whitebark (*Pinus albicaulis*)
 pine, yellow (see pine, ponderosa)
 pinegrass (see grass, pine-)
 plantain, broad-leaved (*Plantago major*)
 potato, Indian or mountain (see spring beauty)

raspberry, wild (*Rubus idaeus*)
 red-osier dogwood (*Cornus sericea*)
 “red willow” (see red-osier dogwood)
 roses, wild (*Rosa nutkana*, *R. acicularis*, *R. woodsii*)
 saskatoon berry (*Amelanchier alnifolia*)
 sagebrush, big (*Artemisia tridentata*)
 silverberry (*Elaeagnus commutata*)
 silverweed (*Potentilla anserina* spp. *anserina*)
 soapberry (*Shepherdia canadensis*)
 spring beauty (*Claytonia lanceolata*)
 spring sunflower (see balsamroot)
 spruce, Engelmann (*Picea engelmannii*)
 stinging nettle (*Urtica dioica*)
 strawberries, wild (*Fragaria vesca*, *F. virginiana*)
 thimbleberry (*Rubus parviflorus*)
 “timbergrass” (see pinegrass)
 tobacco, wild (*Nicotiana attenuata*)
 twinberry, black (*Lonicera involucrata*)
 tule (*Scirpus acutus*, syn. *S. lacustris*)
 water-parsnip (*Sium suave*)
 waxberry (*Symphoricarpos albus*)
 willows, general (*Salix* spp.)
 willow, Pacific (*Salix lasiandra*)
 willow, ‘rope’ (see sandbar willow)
 willow, sandbar (*Salix exigua*)
 willow, Sitka (*Salix sitchensis*)
 wormwood, field (*Artemisia campestris*)
 wormwood, northern (*Artemisia frigida*)
 yarrow (*Achillea millefolium*)
 yew, western (*Taxus brevifolia*)