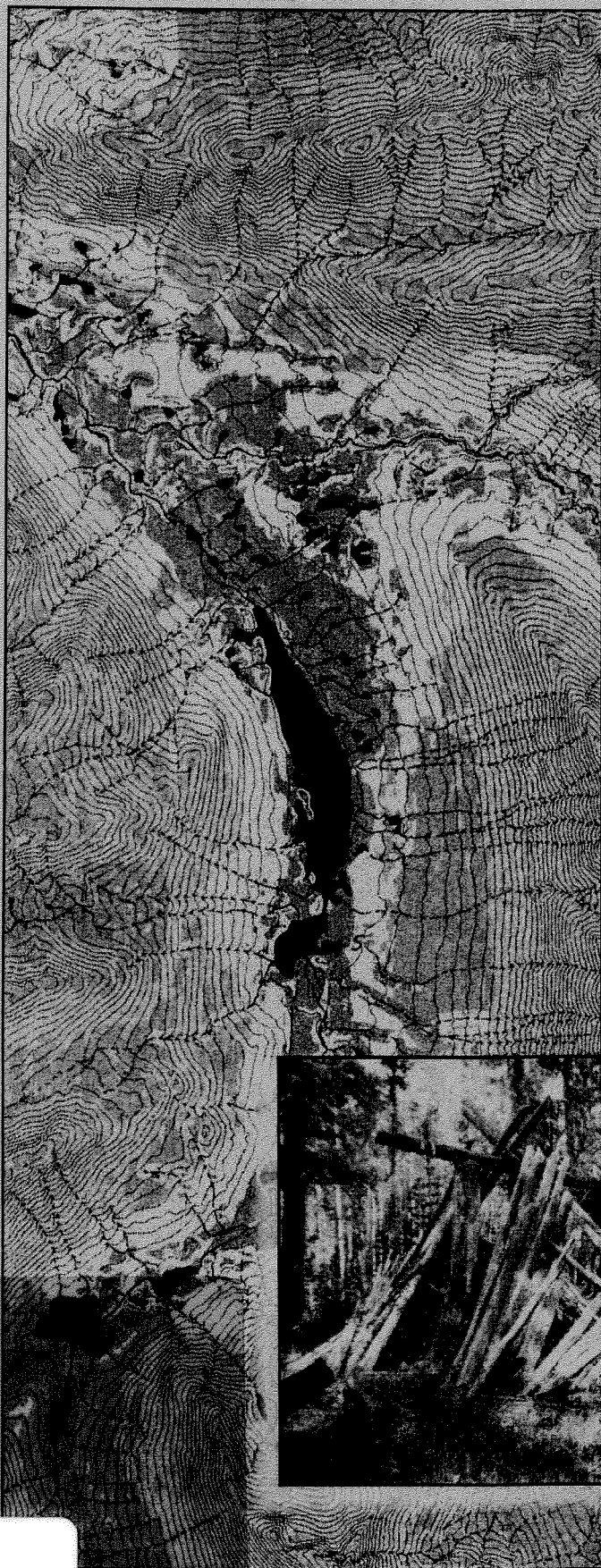
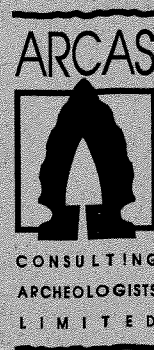




GIS Modelling of Archaeological Potential: Chilcotin Forest District, 1998

Volume 2: Technical Appendices



971
.175
K63
1998 v.2
c1

**GIS MODELLING OF ARCHAEOLOGICAL POTENTIAL:
CHILCOTIN FOREST DISTRICT, 1998**

**Volume 2
TECHNICAL APPENDICES**

Prepared for:
Ministry of Forests
Cariboo Forest Region
Williams Lake, B.C.

Prepared by:
Arcas Consulting Archeologists, Ltd.
Coquitlam, B.C.

July, 1998

HERITAGE RESOURCE CENTRE
MINISTRY OF SMALL BUSINESS,
TOURISM AND CULTURE
101 - 800 JOHNSON STREET
BOX 9821, STN PROV GOVT
VICTORIA BC V8W 9W3

TABLE OF CONTENTS

LIST OF FIGURES	iii
LIST OF TABLES	iii
INTRODUCTION	1
APPENDIX A: First Nations Involvement	4
Introduction	4
Record of Contacts with First Nations	5
Terms of Working Agreement	8
APPENDIX B: Ethnographic Research	9
Introduction	9
Early Post-Contact Historical Documents	10
Post-Contact Ethnographic Studies	11
Oral Traditions	11
Recent Ethnographic Research	12
Traditional Activity Table	13
APPENDIX C: Archaeological Research	31
Review of Archaeological Survey Coverage	31
Forestry AIA Database	42
APPENDIX D: Community-based Archaeological Research	68
Introduction	68
Methodology	68
Results	70
Evaluation	71
APPENDIX E: Trail Research	73
Introduction	73
Methodology	73
Results	74
Recommendations for Further Research	76
APPENDIX F: Biophysical Research	94
Introduction	94
Biophysical Setting	94
Biogeoclimatic Zones	95
Review of Biophysical Sources	97
APPENDIX G: Palaeoenvironmental Research	101
Introduction	101
Glacial and Post-glacial History	101

Review of Paleoecological Studies in the Study Area	104
Paleoclimate of South Central British Columbia	108
Ecological Considerations for Vegetation Reconstruction	109
Reconstructed Xerothermic and Mesothermic Biogeochrons	112
Conclusions	114
APPENDIX H: Modelling Information	117
Introduction	117
Innovations in Spatial Analysis for Archaeological Predictive Modelling	117
Feature Definitions Table	119
Logical Statements	126
APPENDIX I: Archaeological Inventory Analysis	145
Introduction	145
Archaeological Inventory Analysis	147
Archaeological Inventory Priorities and Recommendations	153
APPENDIX J: Data Gaps	157
Glacial Geology Mapping	157
Soils and Surficial Geology	158
APPENDIX K: Consultation With First Nations as an Archaeological Management Action	160
APPENDIX L: Bibliography	162

LIST OF FIGURES

Figure G1: Glacial ice flow directions and extent of deglacial lakes in the Central Interior Plateau, British Columbia	102
Figure G2: Paleovegetation, paleoclimate inferences, and Neoglacial phases in the south and central Interior of British Columbia	105
Figure G3: Location map showing the Chilcotin and Quesnel Forest Districts in the Central Interior of British Columbia	106
Figure G4: Reconstructed precipitation and temperature trends from Marion Lake, southwestern British Columbia	109
Figure G5: Summary of recommended biogeochronal shifts for the Quesnel and Chilcotin Forest Districts	115

LIST OF TABLES

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District	14
Table C1: Selected Judgemental Research Inventory Projects in the CFD	31
Table C2: Selected Systematic Research Inventories Conducted in the CFD	33
Table C3: Selected Development AIAs Issued in the CFD	34
Table C4: Selected Forestry AIA Permits Issued for the CFD (1994 to August 1997)	36
Table C5: Relative Levels of Forestry Survey Coverage	39
Table C6: Key to the CFD Forestry Database Fields	40
Table C7: Chilcotin Forest District AOA - Forestry Database (1994-1997) - Selected Fields	41
Table D1: Ground-truthing Results	71
Table E1: Key to Chilcotin Forest District Trail Inventory Table	75
Table E2: Chilcotin Forest District Trail Inventory	77
Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers	120
Table H2: Logical Statements for the Chilcotin/Quesnel Archaeological Potential Model	127
Table I1: Archaeological Projects Conducted in Each Biogeoclimatic Subzone	149
Table I2: Systematic Inventory Coverage by Biogeoclimatic Subzone	150
Table I3: Systematic Inventory Coverage by Ecosection	151
Table I4: Recommended Variable Priorities	154

Table I5:	Recommended Watershed Inventory Priorities	155
Table J1:	Soils and Surficial Geology Analog Map Coverage	159

GIS MODELLING OF ARCHAEOLOGICAL POTENTIAL: CHILCOTIN FOREST DISTRICT, 1998

Volume 2: TECHNICAL APPENDICES

Introduction

This volume accompanies the **GIS Modelling of Archaeological Potential: Chilcotin Forest District, 1998 Volume 1: Final Report**. These appendices provide additional details on a number of the major components involved in the research and development of the model utilized in the AOA. The appendices include specific information on First Nations Involvement, community-based archaeological research, and a definition of consultation. They also include a review of the sources utilized in the ethnographic, archaeological, trail, and biophysical research, as well as discussions of palaeoenvironmental research and archaeological inventory priorities. Additional information is also provided on the construction of the GIS model and the limitations of some of the data used in the AOA. **Volume 2** concludes with a bibliography of sources consulted during the course of this project.

Limitations and Data Gaps

As described in the **Final Report**, Arcas recognizes that the model of archaeological potential utilized in the AOA has a number of limitations, and that a variety of significant data gaps exist. It has always been our opinion that the AOA is a first step in the process of modelling archaeological potential within the Chilcotin Forest District, and that it is essential that it be considered *a work in progress*. In the **Final Report**, a number of recommendations were made for addressing the identified gaps in the data and developing a model review process, and it is important to reiterate that a number of these significant data gaps and limitations continue to exist. In particular, the AOA is limited by a lack of comprehensive data in the following areas:

- systematic archaeological inventory data, particularly in higher elevations
- aboriginal trail routes and origins
- traditional use information
- traditional non-subsistence activities

The AOA is also limited by a lack of access to community knowledge of site locations and problems with the resolution and availability of baseline digital information

Aboriginal people have utilized and occupied the Chilcotin Forest District for thousands of years. There is much that is not known at present about the nature and extent of that use and occupancy. Archaeological sites can potentially be identified anywhere where the land has not been significantly disturbed by natural processes or people. In addition, not all aspects of aboriginal culture are recorded in anthropological and historical literature, and much undocumented knowledge of traditional culture still exists in contemporary aboriginal (First Nation) communities. Aboriginal

the utility of the AOA as a management tool. It is our view that the AOA should not be used operationally if the linkage between classes of archaeological potential and archaeological management actions are broken. If such changes occur, the model must be revised accordingly.

culture has undergone significant changes as a result of contact with Europeans, and some aspects of traditional culture as reported in the literature may not be an accurate representation of past land use and occupancy. These considerations, along with others identified in the **Final Report**, should caution against acceptance of the AOA model as a complete and final authority on archaeological potential in the CFD.

Relationship Between an AOA and a TUS

The model relied heavily on the readily available ethnographic and historical information about traditional land use patterns for predicting archaeological potential. Contemporary traditional use information represents an extremely useful data source that could augment and refine the archaeological potential predictions made in this AOA. However, this information was not available for use by Arcas during the project. As an AOA and a TUS are closely linked and can be mutually beneficial, we suggest that the need for a revision to the AOA model should be addressed once the ongoing Tsilhqot'in TUS is completed.

Archaeological Management Issues

It is important to recognize that the AOA was always intended by Arcas to be used as one of many sources of information for making archaeological management decisions. The AOA should be cooperatively used as a planning tool by all parties with an interest in archaeological management, and should serve only as a *guideline* for management decisions. The **Final Report** strongly recommends meaningful consultation with First Nations for all development areas. To clarify what we mean by meaningful consultation, we have prepared the attached discussion (see Appendix K).

We wish to stress that the AOA should not be used to avoid, or as a substitute for, consultation with First Nations. Also, the AOA maps should only be used to manage (that is, identify and protect) archaeological resources. They are not intended to be used for managing other resources. Furthermore, the AOA is intended to predict and manage only physical archaeological evidence, and is not intended to predict and manage traditional use sites which may occur at or near archaeological sites.

It should be noted that the four classes of archaeological potential reflect the likelihood of encountering archaeological sites. They are, in other words, a measure of the predicted *frequency* of sites rather than a measure of the *importance* of sites. It is possible that archaeological sites of great importance (both archaeologically and culturally) could be present in areas predicted to have low archaeological potential.

Operational Use of the AOA

AOA potential models can be constructed in a number of different ways. The model utilized in the AOA of the CFD employed a particular approach that categorized the land of the CFD into four classes of archaeological potential with specific archaeological management actions being recommended for each class. The approach used in this model and the number of classes defined are integrally linked with the recommended management actions. Accordingly, the value of the model as an archaeological management tool relies on the implementation of the associated management actions. Therefore, *significant changes to the recommended management actions will compromise*

APPENDIX A: First Nations Involvement

Introduction

The AOA contract held with the Ministry of Forests required that a detailed record be kept of attempts at contacting and consultation with First Nation communities. Contact with First Nations focussed on the resident communities of the Tsilhqot'in Nation, represented by the Tsilhqot'in National Government (TNG), and the Ulkatcho First Nation, represented by the Carrier Chilcotin Tribal Council (CCTC). None of the non-resident First Nations responded to the initial contact letter. A summary of major attempts at contact, information-sharing and participation is provided below. In addition to the letters and meetings described below, informal contact with resident communities, the TNG, and the CCTC was attempted or made by fax and telephone on numerous occasions, at which time various concerns and issues were raised. Also, a number of meetings with representatives of the TNG and member communities were held in conjunction with the community research and anecdotal site survey. Lastly, a variety of AOA reports, materials, interim products and final deliverables were made available to the TNG, CCTC, and Ulkatcho First Nation for their review and comment. These included copies of progress reports, interim digital products (baseline data on CD), interim modelling materials, final digital products (modelled mapsheets, sites and trails on CD), and copies of the **Final Report**.

It should be noted that the TNG do not acknowledge their communication and contact with Arcas Consulting Archeologists regarding this AOA as representing "meaningful consultation". Rather, they considered this contact to be "information-sharing" only. In the interests of ensuring that the AOA be conducted as fairly and accurately as possible under the circumstances, the TNG agreed to provide their review and comments on the AOA methodology and assisted with some aspects of information gathering. However, during the course of meetings with Arcas after completion of the AOA, the TNG indicated that they found the results of the AOA to be unacceptable, and they have rejected the archaeological management recommendations made in the report. Wherever possible, Arcas attempted in good faith to consider the perspective of the Tsilhqot'in Nation and incorporate community knowledge in the modelling process. Various opportunities for involving the Tsilhqot'in Nation in the AOA were explored or initiated, but for a variety of reasons these were not fully realized.

The TNG has made it clear that they did not participate in the AOA as willing or equal partners. Several key points raised by the TNG include:

- Although the TNG met with Arcas a number of times during the course of the AOA project, it is their opinion that the level of contact between Arcas and the TNG cannot be considered to represent meaningful consultation. The level of contact for this project was limited primarily to Arcas sharing information with the TNG, and periodically informing them of the progress of the project.
- The contact that did occur between the TNG and Arcas does not in any way imply that the TNG agrees with the process or results of the AOA, as was clearly stated in the **Terms of Working Relationship** signed by Arcas and the TNG on May 15, 1997.

- The TNG feel they did not have adequate input in producing and reviewing the model or the report, and that accordingly their concerns with the model and recommendations were not fully addressed.
- Representatives of the TNG have asked that their names be removed from the **Acknowledgements** in the **Final Report** in order to clarify that they do not agree with the model or results.

Record of Contact with First Nations

Phase 1 (April 1 to July 15, 1997)

- After the AOA was awarded to Arcas by the MoF (early February 1997), the TNG, the CCTC, and all resident First Nations with an interest in the CFD were notified by mail of the forthcoming AOA project, and their input and involvement was invited. This initial contact was followed up by phone and fax to ensure that contact and notification had been made.
- Start-up meetings with the TNG were held on April 10 and 11 to discuss the role and involvement of the TNG in the AOA. These meetings were followed up with several phone calls and faxes which summarized Arcas' understanding of the TNG position.
- A start-up meeting with the CCTC, who represented the Ulkatcho First Nation, was held on April 9 at which time an informal working relationship, scheduling, and community involvement was discussed.
- Additional meetings with the TNG were held on May 13, 14, and 15 to finalize the **Terms of Working Relationship** (see below). This document summarizes the position of the Tsilhqot'in Nation in regards to the AOA.
- After the contract with MoF was signed in late May, 1997, all resident and non-resident First Nations with an interest in the CFD were contacted by mail in June.
- A meeting was held with the TNG on July 2 to finalize the community/anecdotal sites research position, and Stan Stump Sr. was selected by the TNG to be hired by Arcas. A planning meeting with Stan Stump Sr. was held on July 3.

Phase 2 (July 16 to Oct. 31, 1997)

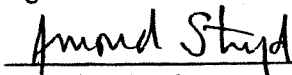
- July 24th, Williams Lake: A meeting was held between representatives of the MoF, Arcas, Millennia Research Limited, I.R. Wilson Consultants Limited, and the TNG to discuss technical AOA/GIS issues.
- July 25th, Anahim Lake: A meeting was held between representatives of Arcas and representatives of the Ulkatcho First Nation, including Laurie Vaughn and Hugh Middleton, to discuss the aims and objectives of the AOA, preliminary model building, and the possible involvement of the Ulkatcho community.

TERMS OF WORKING RELATIONSHIP Archaeological Overview Assessment of the Chilcotin Forest District

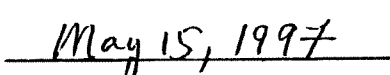
This agreement defines the terms of the working relationship between the Tsilhqot'in National Government and Arcas Consulting Archeologists Ltd for the Archaeological Overview Assessment of the Chilcotin Forest District:

- 1) The Archaeological Overview Assessment (AOA) will be undertaken in a climate of mutual respect and will involve consultation with Elders and representatives of the Tsilhqot'in Nation.
- 2) The Tsilhqot'in Nation has never made a treaty with the Provincial or Federal Government, and this agreement is made without prejudice to aboriginal title or rights.
- 3) The Tsilhqot'in Nation is not in agreement with the B.C. Treaty Commission Process, and does not acknowledge the validity of territorial claims by any other First Nations within traditional Tsilhqot'in territory.
- 4) Participation in this AOA by the Tsilhqot'in Nation does not necessarily mean that the Tsilhqot'in Nation endorses or agrees with the process or results of the AOA.
- 5) The intention of this AOA is not to document aboriginal interests in the land, or to map the potential for the practice or existence of aboriginal rights.
- 6) The AOA archaeological site potential model will be developed starting from the Tsilhqot'in perspective that all of the traditional territory of the Tsilhqot'in Nation, including the Chilcotin Forest District, is an "archaeological site," and the model will delineate site potential in terms of this perspective. In other words, all of Tsilhqot'in traditional territory is assumed to have archaeological remains, unless otherwise demonstrated by the model.
- 7) The AOA will include the identification and recording of a sample of the archaeological sites, trails, wagon roads, battle sites and trade routes known to Tsilhqot'in peoples, with the work to be done by a Tsilhqot'in person accompanied by an archaeologist from Arcas.
- 8) Elders will be paid for their participation in the AOA, with appropriate rates to be determined through discussion with the Tsilhqot'in National Government.
- 9) The AOA will not present detailed information about the archaeological and other sites provided by Tsilhqot'in people as part of this study. Arcas will not release detailed site information provided by Tsilhqot'in people without written permission from the Tsilhqot'in Nation.
- 10) The agreement expires on March 31, 1998, unless extended in writing.

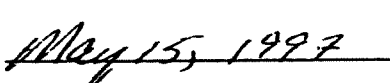
Signed:


Arnoud H. Stryd
Arcas Consulting Archeologists Ltd.

Date:


May 15, 1997


Chief Ervin Charleyboy
Tsilhqot'in National Government


May 15, 1997

negotiate a new research contract. Arcas provided the TNG with a draft contract and Terms of Reference. However, the TNG did not respond prior to the completion of the model.

Phase 5 and Phase 6 (April 1 to July 31, 1998)

- On April 14, a meeting was held in Williams Lake with representatives of Arcas and the TNG in attendance to briefly review the modelled test areas and discuss possible management options for each class of potential.
- On April 14, a meeting was held in Williams Lake between representatives of the CCTC and Arcas to briefly review the modelled test areas and discuss possible management options for each class of potential. An unsuccessful attempt was made to include a representative of Ulkatcho First Nation.
- Unsuccessful attempts by both the Ulkatcho First Nation and Arcas to arrange a meeting were made on several occasions in May, June, and July.
- On July 30, 1998, a final follow-up meeting was held with representatives of Arcas, and the TNG, with a CCTC representative in attendance. The intended purpose of this meeting was to review the final digital and paper maps, review the report, and discuss the recommendations. At this meeting, the TNG rejected the results and recommendations of the AOA.
- At the time of writing, an official follow-up meeting between representatives of Arcas and the Ulkatcho First Nation is still intended. However, an informal review and demonstration of the AOA model, maps, and digital products was presented to representatives and members of the CCTC and Ulkatcho First Nation at the Carrier Tribal Gathering at the Blackwater River, on August 26, 1998.

observations and interpretations may have been coloured by ethnocentric bias. Furthermore, by the time of these ethnographic studies, many aspects of traditional aboriginal culture had been affected by the arrival of Euro-Canadian culture and the imposition of colonial and Canadian rule. Again, ethnographic studies must be reviewed critically.

It is also important to recognize that valuable traditional knowledge is still held today by aboriginal individuals, and much traditional knowledge exists within contemporary Tsilhqot'in and Dene communities. Contemporary oral traditions and local knowledge provide many insights into the culture and history of the Tsilhqot'in and Dene. Although traditional knowledge often corroborates and expands upon the information found in historical and ethnographic studies, at times traditional knowledge contradicts this information.

The sources consulted in the historic and ethnographic research can be grouped into the following categories: (1) early post-contact period (late 18th and 19th century) historical documents and journals, (2) post-contact (late 19th and early 20th century) ethnographic studies, (3) published oral traditions and contemporary traditional knowledge supplied by local aboriginal informants, and (4) recent (mid-to-late-20th century) anthropological studies and doctoral dissertations.

Early Post-Contact Historical Documents

The earliest historical reference to the Southern Carrier appears in the journals of Alexander Mackenzie, who travelled along the Blackwater River in 1793 on his journey from the Fraser River to Bella Coola (Mackenzie 1995). The Tsilhqot'in are not directly referred to in this document. Although the Blackwater River is outside the study area, the Dene encountered by Mackenzie would almost certainly have travelled and lived within the current boundaries of the Chilcotin Forest District. Mackenzie's journal makes a number of informative references to material culture, subsistence activities, habitations, and various cultural practices. These observations appear to have been made objectively and accurately as they are corroborated by later historical, ethnographic, and archaeological sources. The next direct reference to both the Southern Carrier and the Tsilhqot'in is found in the journals of Simon Fraser, who travelled down the Fraser River in 1808 (Fraser 1960). However, very little information on traditional land use activities is available from this document.

Other early historical documents which may contain useful information include Hudson's Bay Company (HBC) records, North West Company records, the journals of fur traders, and missionaries. By the early 1800s, trading posts were established on the periphery of the study area within the traditional territory of the Dene. The published journals of Daniel Williams Harmon (Harmon 1903, 1957), a North West Company trader stationed at the Stuart and Fraser Lake posts from 1810 to 1819, contain a variety of generalized references to Dene traditional activities. In 1815, a Hudson's Bay Company employee named Ross Cox entered the Chilcotin Plateau to establish trading contacts with the Tsilhqot'in. His experiences in the area and early ethnographic descriptions of the Chilcotin are detailed in his journal (Cox 1832). By 1821, a HBC post was established at Alexandria on the Fraser River, and from 1829 to 1844 a HBC post was operated at the confluence of the Chilcotin and Chilko Rivers. A limited description of the activities at the Fort Alexandria post can be found in McGillvary (1947[1827]). In 1844, another post was established on Kluskus Lake. During the 1840s, Catholic missionaries began to travel through the study area, visiting many of the major villages. Both the HBC and the Catholic Church continued to operate in the study area throughout the

- July 30th, Anaham IR: A meeting was held between representatives of Arcas and Stan Stump Sr. to organize the community research and anecdotal site survey components of the research.
- August 19th, Williams Lake: A Steering Committee meeting was held with representatives of Arcas, the MoF, and the TNG in attendance in order to discuss the progress of the AOA. The TNG chose to leave this meeting early, and declined to participate in future MoF Steering Committee meetings.
- August 19th, Williams Lake: A meeting was held with representatives of the TNG and Arcas in attendance to discuss appropriate levels of consultation and timelines.
- August 25th, Williams Lake: A meeting was held with representatives of the TNG and Arcas in attendance to discuss planned AOA tasks.
- August 27th: A report outlining the status of the Phase 1 and Phase 2 tasks, coordination with other AOAs, and the nature and extent of future contact with the Tsilhqot'in Nation and members communities was prepared for the TNG.
- September 4th, Williams Lake: A meeting was held between representatives of the TNG and Arcas to discuss the progress of the AOA.
- October 4th: A report outlining the status of the Phase 1 and Phase 2 tasks, coordination with other AOAs, and the nature and extent of future contact with the Ulkatcho First Nation was faxed and mailed to Hugh Middleton.
- October 21st, Williams Lake: A representative of Arcas presented a brief review of the AOA process, tasks, scheduling, and contact with First Nations to a meeting attended by representatives of the TNG and TNG community members.

Phase 3 and Phase 4 (November 1, 1997 to March 31, 1998)

- Arcas contacted the TNG by phone and/or fax on November 17 and 24, December 16 and 18, 1997 and on January 23, February 2 and 13, and March 11, 1998 in order to update the TNG on the progress of the project.
- The Ulkatcho First Nation was contacted by mail on February 18 and March 11, 1998 to update the community on the progress of the project. Unsuccessful attempts were also made to contact the appropriate Ulkatcho representatives by phone.
- Meetings were held between representatives of Arcas, the TNG, and member communities on January 14, February 19, and March 20, 1998 to discuss the AOA process and review the progress of this study.
- Several unsuccessful attempts were made by Arcas in December and January to contact Stan Stump Sr. in order to obtain and review the results of the community research interviews. As a result of this failure, the TNG and Arcas jointly agreed to terminate the work of Mr. Stump and

APPENDIX B: Ethnographic Research

Introduction

An understanding of traditional aboriginal land use is important for placing the archaeological resources of the study area into a cultural context, and for gaining a basic understanding the distribution and frequency of archaeological sites resulting from aboriginal land use. Of special interest are those aspects of traditional use and activities that can be expected to be represented in the archaeological record, particularly cultural features and materials relating to subsistence and settlement patterns. Furthermore, an understanding of aboriginal lifeways in the early contact era is helpful for determining the probable function and significance of archaeological sites of the pre-contact period (the era before contact with Europeans).

The purpose of this section is to provide a brief description and critical review of the historic, ethnographic, and traditional sources consulted during this study. The information from these sources was compiled into a **Traditional Activity Table** (see below) which formed the foundation of the model of archaeological potential. This section is not intended to provide a detailed overview of traditional aboriginal culture and land use in the region. For a more comprehensive ethnographic review and overview of traditional aboriginal activities, see Bussey and Alexander (1992) and Alexander (1997).

The majority of the Chilcotin Forest District (CFD) falls within the traditional territory of the Tsilhqot'in Nation and the Southern Carrier (Dene). Portions of the CFD also fall within the traditional territories of Secwepemc, Nuxalk, Homalco, and Kwakiutl communities. Four Tsilhqot'in communities (Tl'etinqox-t'in, Tsi Del Del, Xení Gwet'in, Yunesitin) and one Southern Carrier community (Ulkatcho) are found within the CFD. At the time of contact, the Tsilhqot'in and Southern Dene occupied the majority of the study area. As such, the following review focuses on historic, ethnographic, and traditional sources pertaining to the Southern Dene and Tsilhqot'in. Although important differences exist between the cultures of these two groups, the Tsilhqot'in and Dene are related culturally and linguistically, and many aspects of the traditional land use of the area were shared and represent a generalized traditional land use pattern.

An important source of information about traditional aboriginal culture can be found in written historic documents and ethnographic studies. Historic documents record the observations, reactions, and impressions of early European visitors to the area. Historical documents do not attempt to provide a systematic overview of aboriginal culture, nor are the authors trained in anthropological method and theory. Although historical documents often provide invaluable references to past activities and material culture, they are often coloured by ethnocentric biases and suffer from generalizations and anecdotal observations. As a result, all historical documents must be critically reviewed and corroborated.

Ethnographic studies, on the other hand, systematically describe many aspects of traditional aboriginal culture, and many were written by authors trained in anthropology. As such, ethnographies are often an invaluable source of information on subsistence and settlement patterns. Nonetheless, the limitations of these studies also must be recognized. Many ethnographies are based on limited contact with aboriginal individuals over a short period of time. In addition, some early

remainder of the 19th century. Unfortunately, archival research into the HBC records and journals and the records of early missionaries were beyond the scope of study for this AOA. If available, these documents should be utilized in future revisions of this AOA.

After the commencement of the Cariboo Gold Rush (1861), a number of private and government survey parties travelled across the Chilcotin Plateau in search of possible rail and wagon routes. One of these expeditions was documented by Lieutenant H. Spencer Palmer. Palmer, who was led by Tsilhqot'in guides, travelled from the "Precipice" above the Hotnarko River across the Chilcotin Plateau to Alexandria on the Fraser River (Palmer 1863). Although coloured by ethnocentric bias, this document contains a number of useful references to village sites, trails, and subsistence activities which are considered to be reliable. Another potentially useful source of historical information may be found in the government documents and private recollections pertaining to the so-called "Chilcotin War of 1864" (Hewlett 1972, 1973). These sources were not readily available for study for this project.

Post-Contact Ethnographic Studies

The earliest documented ethnographic observations of the Southern Carrier and Tsilhqot'in people are found in the writings of Adrien G. Morice (1890, 1893, 1905, 1906), who spent many years as a Catholic priest in the northern interior, focused many of his observations on the Southern Dene and only makes passing references to the Tsilhqot'in. Although his observations often suffer from generalizations and ethnocentric bias, Morice's 1893 publication provides fairly substantial information on material culture and subsistence activities of the Dene as a whole. The first substantial written account of Tsilhqot'in lifeways is provided in a short report by James Teit (1909). During the 1890s, James Teit carried out relatively systematic ethnographic studies of the Nlaka'pmx, Stl'atl'imx, and Secwepemc peoples, and visited the neighbouring Tsilhqot'in on several occasions. The writings of Teit were edited by the anthropologist Franz Boas, and the published manuscripts reflect Boas' "biases in organization, subject matter, and theoretical orientation" (Hayden 1992:32). Nonetheless, Teit provides the most significant early ethnographic writing on traditional ways of life in the area. Although Teit's (1909) Tsilhqot'in monograph is brief and based on only two weeks of fieldwork, he provides invaluable information describing the locations of winter villages, material culture and dwellings, and the traditional subsistence economy.

In the first half of the 20th century, a number of anthropologists conducted ethnographic research among the Tsilhqot'in and Dene. Studies by Goldman (1940, 1941) and Steward (1960) focus on post-contact period changes to Dene social organization and clan systems, and they provide little information on traditional economic or land use activities. Verne Ray (1939, 1942) included the Southern Dene and Tsilhqot'in in his empirical analysis of Plateau culture traits, but the Tsilhqot'in data were obtained from a single informant from each group and they are not considered reliable or comprehensive. Some useful information on Tsilhqot'in subsistence and settlement patterns is found in a dissertation by Robert Lane (1953). A brief article by Lane (1981) also provides a concise but useful overview of Tsilhqot'in culture and history which is largely based on his original fieldwork.

Oral Traditions

Few published accounts of oral traditions are available for the study area. Information on oral

Lastly, an ethnographic collection of Tsilhqot'in material culture at the Field Museum in Chicago was recently described (VanStone 1993). Although this study does not provide information on traditional activities, it does provide useful descriptions of the material culture resulting from these activities.

Traditional Activity Table

The historical and ethnographic research noted previously was used to help compile an extensive **Traditional Activity Table** (Table B1) which was utilized in the model building process. Information from historical, ethnographic, and informant sources were summarized into four of the table columns: (1) traditional activities, (2) activity site types, (3) potential archaeological evidence, and (4) the locations of traditional activities. A list of traditional activities was generated by reviewing all of the sources of information described above, including local knowledge where applicable. Next, the site types, potential archaeological evidence, and activity locations for each traditional activity was summarized and referenced. This information was then reviewed and checked against archaeological evidence.

The information contained within the **Traditional Activity Table** should not be considered exhaustive, nor is it intended to account for all possible traditional activities. Rather, it should be remembered that this table is a summary based largely on an incomplete ethnographic and historic record, and only represents the information available for this project. It is expected that the information provided by traditional use studies, once it becomes available, will greatly enhance the comprehensiveness of the information.

traditions can be obtained through the ethnographic literature such as Birchwater (1993), Davis (1970), and Farrand (1898, 1900). Farrand (1898, 1900) documented a number of Tsilhqot'in traditions, some of which make limited references to subsistence activities. In addition to published works, a number of local Tsilhqot'in informants provided oral information on the traditional use of the study area. These informants include: Murray Elkins (Tletinqox-t'in), Adam Guichon (Tsi Del Del), Rocky Guichon (Tsi Del Del), Eliza Williams (Xeni Gwet'in), Lesley Stump (Tletinqox-t'in), Alex Lulua (Xeni Gwet'in), Chief Ervin Charleyboy (Tsi Del Del), Gilbert Solomon (Xeni Gwet'in), Donald Ekks (Tsi Del Del; see Klassen 1996a), Patrick Charleyboy (Tsi Del Del), Raymond Alphonse (Tletinqox-t'in), and Joe Alphonse (Tletinqox-t'in). Where appropriate, the comments of these informants were incorporated into the traditional activity table used in the model building. Some of these informants also supplied site-specific information as part of the community research component of this study (see Appendix D).

Recent Ethnographic Research

Several recent ethnographic studies indicate that much valuable information about traditional lifeways can still be obtained through community research. Tyhurst's (1984) unpublished manuscript focuses on recent economic and social change in Tsilhqot'in culture, but it also includes substantial information on traditional subsistence activities and resource use. In particular, Tyhurst (1984) provides a detailed account of the seasonal round. He also describes the most important fish, game, and plant resources traditionally utilized by the Tsilhqot'in and the material culture and activities associated with fishing, hunting, and plant gathering. Some information on important trade routes/aboriginal trails also is provided, and typical locations of wintering sites and fishing camps are described. A number of recent publications also provide brief, general overviews of traditional Dene lifeways (Birchwater 1991, 1993; Furniss 1993a, 1993b). These sources provide generalized information on the seasonal round and trail networks. Tobey (1981) provides a concise overview of Southern Dene culture and history, but few specifics pertaining to subsistence activities and settlement patterns are included.

A number of "ethnoarchaeological" studies of Tsilhqot'in subsistence activities have also been recently undertaken. Ethnoarchaeological studies document the activities which take place at recent or contemporary resource procurement sites, and record the types of materials and features left at these sites after their use. This information may be useful in predicting the location of archaeological sites where similar subsistence activities took place in the past, and interpreting the type of activities which took place at these sites. For example, observing the types of activities which take place at contemporary fishing stations, and the types of materials and structures used at these sites, helps us to understand what activities took place at archaeological sites used for similar purposes as well as what artifacts we can expect to find there. Magne and Matson (1984) include a number of ethnoarchaeological observations on Tsilhqot'in subsistence activities obtained during the Eagle Lake Project. In the vicinity of Choelquoit Lake, a variety of contemporary fishing camps and stations also were documented by Burnard-Hogarth (1983, 1984, 1987) and Alexander et al. (1985) before, during, and after their use. In 1984, Diana Alexander and Robert Tyhurst conducted interviews with two Tsilhqot'in women, and observed the harvesting of root crops in the subalpine areas of the Potato Mountains (Alexander et al. 1985).

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District						
Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 3	base camp - (MC 95: 146, 148, 170) - (F 00:3) -also see Habitation - seasonal / temporary	see Habitation - seasonal / temporary - hearths (M 93:92), (MC 95:146, 149) - drying racks (TY 84:59), (M 93:92), (MC 95:149) - cache pits, above ground cache (M 93:197), (MC 95:149) - temporary structures (M 93:193), (MC 95:146, 183, 186) - rectangular gabled structures (MC 95:148) - post molds (MC 95:149) - artifacts (MC 95:147)	Lithic, Cache, Fish, CMT	- on terraces and level ground near salmon-bearing rivers; also often associated with streams, lakes and wetlands near salmon-bearing streams - summer fishing camps on Chilcotin past Anaham (F 00:3) - 2 family summer fishing camp on bank of Fraser R (MC 95:146-147) - single gabled structure occupied in salmon fishing season on bank of Fraser R (MC 95:148) - seasonal houses near rapids at Cottonwood Canyon on Fraser R (MC 95:183) - seasonal fishing lodges on small lake (MC 95:186)	- salmon-bearing streams - lakes, streams, wetlands - river terraces (glaciofluvial) - slope - BGC zone not AT, ESSF, MSxv
Fishing: trout, suckers - ice fishing (T 09:764, 779), (F 00:33) - year round fishing (TY 84:54) - in autumn months or cold season; suckers in April (M 93:74, 75, 89, 106, 124, 156, 159) - in lakes (M 93:198, 200) - in July in Ulgako Creek (MC 95: 202-203)	TYP 4	fishing station	- using gillnets, spears, cooking, drying, caching (TY 84:54, 57, 59-60, 107) - weirs/stakes (T 09:764, 779), (M 93:47, 89) - traps (T 09:764, 779), (TY 84:57), (M 93:74) - nets (T 09:764), (TY 84:57), (M 93:124, 159) - artifacts (stone, bone) (T 09:779), (TY 84:57), (M 93:47, 75, 88, 156) - hearths (MC 95:204) - cooking pits (TY 84:60) - drying racks (TY 84:58-60)	Fish, Lithic, Cache,	- shallow water near inlets and outlets, along margins of lakes with fish populations and in pools at base of waterfalls - streams and lakes in spring; year round near lakeshores and mouths of streams (TY 84:54, 57) - waterfall at stream connecting Elkin and Vedan Lakes (TY 84:57) - in small shallow lakes on E plateau and in larger lakes such as Tsuniah and Choelquoit (TY 84:60) - from plateau S to Lord R, around Choelquoit L and Nemiah L and in mountains and valleys N of Bute Inlet (TY 84:107) - mouth of Chilco R (T 09:779) - trapped in lakes and rivers in outlets of lakes and shallow steams (M 93:74, 89) - Kluskus and Tsetzi Lakes (MC 95:198, 200)	- lakes - salmon and fish streams - confluences of lakes and salmon and fish streams - waterfalls - BGC zone not AT, ESSF

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Fishing: sockeye, chinook, steelhead - salmon (T 09:779) - salmon and steelhead in fall (TY 84:51, 54, 57-59, 80-82, 85) - seasonal migration to Chilcotin R for salmon fishing in fall (F 00:3) - in summer (MC 95:149, 161, 177, 179, 183) - in July, August (M 93:11, 47, 71, 73, 74, 84-92, 106, 196-197)	TYP 1	fishing station - summer on Fraser R (MC 95:149, 177, 179) - (MC 95:206)	- rock structures - drying racks (TY 84:59), (M 93:92) - artifacts (stone, bone) (TY 84:57-58), (M 93:47, 71, 88) - cache pits (M 93:197) - hearth (M 93:92) - above ground cache (T 09:776), (M 93:196) - weirs and traps (T 09:779), (TY 84:80), (M 93:84), (MC 95:149, 206) - scaffolds (M 93:91)	Fish, Lithic, Cache	- immediately adjacent to salmon-bearing streams, often in the vicinity of rapids - mouth of Chilko R, along Chilcotin R (T 09: 779) - on Chilko and Chilcotin Rivers between Hanceville and Siwash in turbid waters (TY 84:80-82) - fall fishing in Chilko, Taseko, Chilcotin, upper Chilcotin, Southgate, Homathko, Bella Coola and Dean Rivers (TY 84:54). - Aug fishing at mouth of Nemiah R on Chilko L. (TY 84: 58) - in lakes and rivers; in large rivers and tributaries to large rivers (M 93:11; 73, 74) - weirs at outlets of lakes and shallow streams where current is slow; shallow streams (M 93:89; 90) - summer fishing on Fraser R (MC 95:161, 177, 179) - on Entiako R (MC 95:206)	- salmon-bearing streams - confluences of large lakes and salmon streams - rapids - BGC zone not AT, ESSF, MSxv
	TYP 2	cache	- cache pits (TY 84:51, 59), (M 93:197) - rectangular log structures (TY 84:51), (M 93:196)	Cache	- on terraces, level ground, ridges and gentle slopes near salmon-bearing rivers - near villages, camps, dwellings (TY 84:51)	- salmon-bearing streams - river terraces (glaciofluvial) - slope - BGC zone not AT, ESSF, MSxv

TABLE LEGEND: F 00 = Farrand, 1900; MC 95 = Mackenzie, 1995; M 93 = Morice, 1893; P 63 = Palmer, 1863; T 09 = Teit, 1909; TY 84 = Tyhurst, 1984; W 78 = Wilmeth, 1978. BGC = biogeoclimatic

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 5	base camp (TY 84:107), (MC 95: 198, 200, 202)	see Habitation - seasonal - drying racks (TY 84:107) - above ground cache (MC 95:199) - cache pits (MC 95:199)	Lithic, Cache, Fish, CMT	- on level ground, and knolls adjacent to streams and lakes with fish populations (TY 84:54) - ice fishing at camp at Tatla Lake (F 00:33) - temporary habitations close to fishing station on Kluskus L (MC 95:198) - Ulgako Creek (MC 95:202-203)	- lakes - salmon and fish streams - slope - BGC zone not AT, ESSF
	TYP 6	cache	- cache pits in summer and winter (TY 84:59)	Cache	- on level ground, knolls, ridges, gentle slopes and base of slopes adjacent to streams and lakes with fish populations	- lakes - salmon and fish streams - slope - BGC zone not AT, ESSF
Fishing: kokanee - fall fishing (TY 84:57)	TYP 7	fishing station	- weirs - traps (TY 84:57) - artifacts (stone, bone) - hearths - drying racks - cache pits	Fish, Cache	- in wetlands and shallow water along margins of lakes with kokanee populations - (TY 84:57) all warm shallow lakes	- large and medium lakes - slope
	TYP 8	base camp	see Habitation - seasonal	Lithic, Cache, Fish, CMT	- on level ground and knolls adjacent to lakes with kokanee populations	- large and medium lakes - slope
	TYP 9	cache	- cache pits	Cache	- on level ground, knolls, ridges, and gentle slopes adjacent to lakes with kokanee populations	- large and medium lakes - slope
Fishing: whitefish - harvested year round (TY 84:54, 60, 107) - harvested in October (M 93:74, 106)	TYP 10	fishing station	- artifacts (stone, bone) (TY 84:60) - hearths - drying racks - postmolds	Lithic, Fish	- on level ground and knolls adjacent to lakes with whitefish populations - lakes and streams on W and Central Chilcotin Plateau (TY 84:54) - in large cold lakes (TY 84:60)	- large lakes - slope
	TYP 11	base camp - (TY 84:107)	see Habitation - seasonal - drying racks (TY 84:107)	Lithic, Fish, Cache	- on level ground, knolls, sheltered locations and S-aspects adjacent to large lakes with whitefish populations	- large lakes - slope

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeo-logical Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 12	cache - (M 93:74)	- cache pits	Cache	- on terraces, level ground, knolls, ridges, gentle slopes and base of stopes adjacent to large lakes with kokanee populations	- large lakes - slope
Hunting: mule deer - (T 09:782) - (M 93:11) - summer/fall in subalpine (E. Charleyboy pers. comm. 1998) - winter near villages	TYP 13	base camp	see Habitation - seasonal - artifacts (stone, bone) (T 09:782)	Lithic, Cache	- on level ground, in sheltered locations, and on S-aspects adjacent to meadows, streams and lakes in forested environments, emphasis on subalpine areas and winter range	- wetlands, streams, lakes - mule deer winter range - BGC zones BG, IDF, ESSF, SBSdw2 and SBSmc2 - subalpine (Pa) - open range - slope
	TYP 14	kill / butcher	-artifacts (stone, bone) (T 09:782)	Lithic	- throughout forested environments, with emphasis on subalpine and winter range - drinking holes, narrows, crossings, promontories and S-aspects along lakes and streams, hilltops, gullies, salt licks - in subalpine areas near huckleberry, mountain potato areas (Charleyboy pers. comm.)	- wetlands, streams, lakes - mule deer winter range - BGC zones BG, IDF, ESSF, SBSdw2 and SBSmc2 - subalpine (Pa)
	TYP 15	game overlook	- artifacts (stone, bone)	Lithic	- on knolls and ridges overlooking streams, lakes and large glacial ravines, with emphasis on subalpine and winter range - (M 93:11) timbered areas with lakes and rivers	- mule deer winter range - eskers, glacial drainages, glacial lake margins - cliffs - BGC zones BG, IDF, ESSF - subalpine (Pa)

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 20	cache	- cache pits - rock caches (above ground)	Cache	- on level ground, gentle slopes and base of slopes throughout caribou winter range, but primarily in passes and along game trails and migration routes - in Anahim L area (TY 84:46, 100)	- caribou range - BGC zones AT, MSxv, ESSFwc3, ESSFxv - slope
Hunting: elk (moose) - (TY 84:101) - (M 93:93) - hunting Elk? (MC 95: 148)	TYP 21	base camp	see Habitation - seasonal - hearths (TY 84:101) - drying racks (TY 84:101)	Lithic, Cache, Hunt	- on level ground adjacent to meadows, streams and lakes in forested environments, with emphasis on pine and spruce forests	- wetlands - all streams - all lakes - BGC zones IDF, ICH, SBPS, SBS, but not SBSmc2 - slope
	TYP 22	kill / butcher (MC 95:148)	- artifacts (stone, bone)	Lithic	- throughout forested environments, with emphasis on meadows, streams, lakes in pine and spruce forests - on banks of Fraser R (MC 95:148)	- streams, lakes, wetlands - BGC zones IDF, ICH, SBPS, SBS, but not SBSmc2 - slope - open range
	TYP 23	game overlook	- artifacts (stone, bone)	Lithic	- on knolls and ridges overlooking game trails, meadows, streams, lakes throughout forested environments, with emphasis on pine and spruce forests	- eskers, glacial drainages, glacial lake margins, cliffs - streams, lakes, wetlands - BGC zones IDF, ICH, SBPS, SBS, but not SBSmc2

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 16	hunting blind, drive	<ul style="list-style-type: none"> - rock structures - fences - pits - artifacts (stone, bone) 	Hunt, Lithic	<ul style="list-style-type: none"> - passes and bowls in subalpine areas and along game trails in winter range 	<ul style="list-style-type: none"> - streams, lakes - slope - subalpine (Pa)
Hunting: caribou - in fall (T 09:1909:782) - (TY 84:25, 46, 49, 100, 103-105) - (F 00:33-35, 37, 52) - (M 93:93, 100) - (E. Charleyboy pers comm 1997) - (MC 95: 212)	TYP 17	base camp	see Habitation - seasonal	Lithic, Cache, Hunt	<ul style="list-style-type: none"> - on level ground, sheltered locations and knolls adjacent to large meadows, flowing streams and all lakes in winter range - in Anahim L area (TY 84:46, 100) - Punky Lake (Charleyboy, pers. comm.) - in Rainbow Range (MC 95:212) 	<ul style="list-style-type: none"> - caribou range - all aquatic features - BGC zones AT, MSxv, ESSFwc3, ESSFxv - slope
	TYP 18	hunting blind, drive	<ul style="list-style-type: none"> - rock structures - fences - pits - artifacts (stone, bone) - post molds (M 93:100) - surrounds (TY 84:104-105) - deadfall traps (TY 84:103) - snares (TY 84:103), (M 93:100) - caches 	Hunt, Lithic, Cache	<ul style="list-style-type: none"> - throughout caribou winter range, but primarily in passes and along game trails and migration routes - in passes and along trails, migration routes in winter range (TY 84:49, 103-105) - drive caribou into water trap, Punky Lake (Charleyboy, pers. comm.) - (TY 84:104-105) subalpine areas on N and E Chilcotin Plateau - blinds along game trails (TY 84:49) - in mountain gulches (P 63:52) - in Anahim L area (TY 84:46, 100) - head of gulch in mountains (F 00:33-35, 52) - mountain passes (M 93:100) 	<ul style="list-style-type: none"> - caribou range - BGC zones AT, MSxv, ESSFwc3, ESSFxv - lakes, streams, wetlands - slope
	TYP 19	kill / butcher	<ul style="list-style-type: none"> - artifacts (stone, bone) (T 09:782) - hearths - drying racks (F 00: 33, 35, 37) - postmolds - caches 	Lithic, Hunt, Cache	<ul style="list-style-type: none"> - on level ground and gentle slopes throughout caribou winter range, but primarily in passes and along game trails and migration routes, and adjacent to lakes - in Anahim L area (TY 84:46, 100) - in Itcha Range and Caribou Hills (T 09:782) 	<ul style="list-style-type: none"> - caribou range - BGC zones AT, MSxv, ESSFwc3, ESSFxv - slope

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Hunting / Trapping: beaver, muskrat, otter - hunting beaver, muskrat (TY 84: 25, 49, 50) - men trapping beaver in summer (TY 84:107) - women snaring muskrats (T 09:782) - men trapping beaver, otter (T 09:782)	TYP 29	kill / butcher	- artifacts (stone, bone) - bone - snares - nets (TY 84:49)	Lithic, Hunt	- ponds, lakes, and streams in forested environments - game trails - from/ around winter houses (TY 84:49) - beaver near Siwash Bridge (F 00:33) - Lord R, around choelquoit L, Nemiah L Chilko L, Dean R, and in mountains and valleys N of Bute Inlet and NW of Bridge R (TY 84:107). - hunting in coastal areas for furs; in mountains of Lillooet and Cascade Range (M 93:22; 23)	see TYP4
Hunting / Trapping: snowshoe hare - women snaring rabbits (T 09:782) - (TY 84: 25)	TYP 30	kill / butcher	- artifacts (stone, bone) - bone - snares	Lithic	- throughout forested environment by all Chilcotin (T 09:782)	see TYP19, 22
Trapping: fisher, marten, lynx, fox, coyote - in summer (TY 84:107) - men trapping marten (T 09:782)	TYP 31	kill / butcher	- artifacts (stone, bone) - bone - snares	Lithic	- throughout forested environments - men based hunting and trapping out of summer plant gathering and fishing camps (TY 84:107)	not modelled
Hunting: grouse - (TY 84: 15) - summer (G. Solomon, pers. comm. 1997)	TYP 32	kill / butcher	- artifacts (stone, bone) - bone - snares - rock drives (G. Solomon, pers. comm. 1997)	Lithic, Hunt	- throughout forested environments - Taseko L. area (TY 84:15) - Nemiah Valley (G. Solomon, pers. comm. 1997)	see TYP 19, 22

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Hunting: mountain sheep, goats - (T 09:777, 782) - (TY 84:15) - (F 00:34-35, 43, 50, 52) - (M 93:93)	TYP 24a	base camp	see TYP53 Habitation - seasonal	Lithic, Cache, Hunt	- on level ground adjacent to meadows, streams and lakes in subalpine areas in and adjacent to goat and bighorn range - in mountains (F 00:34-35, 43, 52)	- streams, lakes - BGC zones AT, ESSFwc3, ESSFxv - slope
	TYP 24b	hunting blind	- rock structures - stone artifacts (T 09:782)	Hunt, Lithic	- in subalpine and alpine areas in goat and bighorn sheep range	- slope - BGC zones AT, ESSFwc3, ESSFxv
	TYP 25	kill / butcher	- artifacts (stone, bone) (T 09:782) - caches	Lithic, Cache	- in alpine areas in goat and bighorn sheep range - in mountains (F 00:34-35, 43, 52)	- slope - BGC zones AT, ESSFwc3, ESSFxv
Hunting: bears - fall (TY 84:25, 49) - winter (F 00:33, 50) - (M 93:93, 96, 98, 100-103) - men trapping bear (T 09:782)	TYP 26	base camps	see TYP53 Habitation - seasonal	Lithic, Cache, Hunt	- throughout forested environments - adjacent to streams - around Tatla L in winter (F 00:33)	see TYP53
	TYP 27	kill / butcher	- artifacts (stone, bone) - deadfall traps (TY 84:49) - snares (M 93:98)	Lithic, Hunt	- throughout forested environments	see TYP19, 22, 24b
Hunting / Trapping: marmots - (F 00:33, 38-39) - (TY 84:15) - (M 93:11, 22, 23, 87, 93, 98, 100-103)	TYP 28	kill / butcher	- hearths (F 00:33) - drying racks (F 00:33, 38-39) - artifacts (stone, bone) - traps (M 93:87, 95, 98)	Lithic, Hunt	- level ground adjacent to meadows, lakes and streams in subalpine areas - game trails - trapping marmot in river valleys near Taseko L.; in winter from dens; in late summer / early fall in mountains (TY 84:15, 49) - trapping ground hogs (marmots) in mountains (F 00:38-39) - trapping marmots in subalpine areas near huckleberry, whitebark pine, mountain potato areas (E. Charleyboy pers. comm. 1998)	- wetlands, lakes, streams - subalpine (Pa) - BGC zones AT, ESSFwc3, ESSFxv

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 38	cache	- cache pits	Cache	- adjacent to meadows, ponds, lakes, and streams in subalpine and alpine environments	- wetlands - fish streams - lakes - subalpine (Pa) - BGC zones AT, ESSF
Plant Gathering: balsamroot, nodding onion, silverweed, fern bulb, red lily bulb - dug year round when ground not frozen (TY 84:110) - (TY 84:50, 107, 110) - (M 93:116, 129) - (MC 95: 146)	TYP 39	base camp (TY 84:107)	see Habitation - seasonal - artifacts (stone, bone) (M 93:116) - roasting pits (M 93:116)	Lithic, Roast, Cache	- knolls and level areas adjacent to meadows, ponds, lakes, and streams primarily in areas of Douglas fir forest - beside meadows (D. Ekks pers. comm. 1996) - on banks of Fraser R (MC 95:146)	see TYP13
	TYP 40	processing / cooking (M 93:129)	- roasting pits (M 93:116) - hearths (M 93:129)	Roast, Cache	- knolls, gentle slopes, and level areas adjacent to meadows, ponds, lakes, and streams primarily in areas of Douglas fir forest	- wetlands - streams, lakes - slope - BGC zone IDF
	TYP 41	cache	- cache pits	Cache	- knolls, gentle slopes, base of slopes, and level areas adjacent to meadows, ponds, lakes, and streams in areas of Douglas fir forest	- wetlands - streams, lakes - slope - BGC zone IDF
Plant Gathering: huckle-berries	TYP 42	processing / cooking - blueberries dried into cakes in fall (TY 84:111), (M 93:127)	- hearths - drying trenches / pits - artifacts (stone, bone) (M 93:127)	Roast, Lithic	- subalpine parkland areas - gathered in dry lodgepole pine forests (M 93:127) - collected and roasted in Cheshi Pass, Potato Mtn., Huckleberry Mtn., (E. Charleyboy pers. comm. 1998)	- BGC zones AT, ESSF

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Hunting: waterfowl - (T 09:781) - (TY 84:15) - (M 93:104, 105) - (P. Guichon pers comm 1996)	TYP 33	base camp	see Habitation - seasonal	Lithic, CMT, Cache	- on level ground and knolls adjacent to meadows, ponds, streams, waterfalls, and lakes - near waterfalls in fall, Palmer Creek (P. Guichon pers comm 1996)	- wetlands, lakes - waterfalls - slope
	TYP 34	kill / butcher	- artifacts (stone, bone) - bone - snares (M 93:104)	Lithic	- adjacent to meadows, ponds, and lakes - adjacent to pools beneath waterfalls - waterfalls (P. Guichon pers comm 1996) - most lakes; Anahim, Chezacut (Chilcotin) Lakes for ducks, geese, swans and pelicans in fall (T 09:781) - swans around fishing grounds (M 93:104)	- wetlands - all lakes - waterfalls - slope
	TYP 35	hunting blind	- artifacts (stone, bone) - blinds of brush or stones (M 93:105)	Lithic, Hunt	- on knolls and ridges overlooking meadows, ponds, lakes, and waterfalls	- wetlands - all lakes - waterfalls - slope
Plant Gathering: spring beauty, avalanche lily - spring (TY 84:50, 107, 110-111) - (T 09:780) - (M 93:116) - (MC 95: 211)	TYP 36	base camp	see Habitation - seasonal - artifacts (stone, bone) (T 09:780), (M 93:116) - hearths (M 93:116) - roasting pits (M 93:116) - shelter / lodge depressions (M 93:116) - postmolds (M 93:116)	Lithic, Roast, Cache	- on knolls and level ground adjacent to meadows, ponds, lakes, and streams in subalpine/parkland environments - near Nemiah L and Chilko L in spring (TY 84:110-111) - Cheshi Pass, Potato Mountains, Huckleberry Mtn (E. Charleyboy pers comm 1998) - in Rainbow Range (MC 95:211)	- wetlands - fish streams - lakes - slope - subalpine (Pa) - BGC zones AT, ESSF
	TYP 37	processing / cooking (TY 84:50, 110)	- roasting pits (M 93:116) - hearths - cache pits	Roast, Cache	- adjacent to meadows, ponds, lakes, and streams in subalpine and alpine environments - Nemiah L and Chilko L in spring (TY 84:110-111)	- wetlands - fish streams - lakes - subalpine (Pa) - BGC zones AT, ESSF

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Habitation: winter village - (T 09:760, 775, 776, 788) - (TY 84:51, 129, 163, 246) - (P 63:19) - (F 00:3, 33, 45) - pithouse from Nov-March for S-Carriers and Chilcotin (M 93:106, 192) - (M 93:23-25, 79, 145-157, 184-187, 189-192, 197, 202) - (MC 95: 155, 158, 188)	TYP 52	pithouse (T 09:775, 776), (M 93:23, 78, 106, 184, 191-192), (MC 95:155, 158, 160, 178) -mat lodge (T 09:775-776), (M 93:79, 193), (TY 84:85, 246) -rectangular plank house (T 09:775-776), (M 93:112, 184-187, 189-190, 202)	- housepits (TY 84:51) - lodge floors - artifacts (stone, bone) (M 93:49-52, 55, 66-69, 78, 81, 111-114, 145-157, 166-173) - hearths / fire pits (M 93:79, 112, 187) - cache pits (T 09:776), (TY 84:51, 59), (M 93:197) - above ground cache (T 09:776), (M 93:196) - human remains (T 09:788), (M 93:146) - CMTs - midden - women's huts (T 09:788) - sweats (M 93:197) - drying racks - postmolds (T 09:775-6)	Housepit, Lithic, Cache, Roast, Burial, Fish, Hunt	- terraces, knolls, benches, level ground, sheltered locations (gullies) and S-facing aspects near major rivers (primarily salmon-bearing) and major lakes (primarily large), primarily on W and N sides. - villages around Chezacut (Chilcotin), Puntzi, Anahim, Tatla and Chilko Lakes (T 09:760) - major gathering places at Anahim, Tatla, Puntzi, Chezacut (Chilcotin) Lakes (F 00:3) - E part of C. Plateau (T 09:775) - village at Anahim L (T 09:776) (TY 84:129) called Na'kunt'jun (m23), - winter village at Puntzi L (TY 84:163) - rectangular gabled bark lodge or "niyequn" at Fishtrap L (TY 84:246) - village off main trail on way E to Alexandria (P 63:19) - (M 93:23-27) village on Splint R close to Fraser (Toosey); 2 villages near Chilcotin R (Anaham); one village near Fraser R facing Ft. Alexandria; 2 villages on the Fraser R near Quesnel and Blackwater R; 4 villages on Blackwater R; - pithouse villages on Fraser R north of Quesnel R on an elevated bank and at Ft. Alexandria (MC 95:160, 178). - village near fishing site at Farwell Canyon on Chilcotin R. (TY 84: 85).	- salmon-bearing streams - fish streams - all lakes - slope - glaciofluvial landforms (terraces) - open range - BGC zones BG, IDF, SBPS, SBS

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Plant Gathering: lodgepole pine cambium, pitch - spring for food (M 93:76, 78) - (T 09:781) - (R. Alphonse, pers. comm. 1997) - (MC 95:204)	TYP 48	culturally modified tree	- bark stripped trees - artifacts - bark peelers (T 09:781) (M 93:76) - sap scraper (T 09:781), (MC 95:204)	CMT	- adjacent to meadows, ponds, lakes, and streams in areas of lodgepole pine forest - adjacent to villages, camps, trails - adjacent to camps, trails around Tautri and Rozita Lakes (R. Alphonse, pers. comm.)	- wetlands - streams, lakes - trails - old-growth lodgepole pine - BGC zones MS, SBPS, SBS
	TYP 49	cooking	- roasting pits - hearths - cache pits	Roast	- adjacent to meadows, ponds, lakes, and streams in areas of lodgepole pine forest - adjacent to villages, camps, trails	- wetlands - streams, lakes - slope - old-growth pine - BGC zones MS, SBPS, SBS
Plant Gathering: trees for material - felling methods (M 93:47) - for planks (M 93:47) - spruce, birch, cottonwood for canoes (TY 84:113-114)	TYP 50	culturally modified tree	- tree stumps (with tool marks) - artifacts (canoes, planks) - stone artifacts (M 93:47)	CMT, Lithic	- old-growth Douglas-fir stands	- biogeoclimatic zone (IDF)
Plant Gathering: tree bark for material - cedar, spruce (M 93:197; MC 95:148)	TYP 51	culturally modified tree	- bark-stripped trees (MC 95:148) - artifacts (stone, bone)	CMT	- old-growth cedar stands - forested environments adjacent to villages and seasonal camps. - on banks of Fraser R (MC 95:148)	- old-growth cedar - lakes, streams, wetlands - BGC zones CWH, ICH, MH

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Plant Gathering: saskatoons / soap-berries / blueberries - blueberries in autumn (TY 84:110-111), (M 93:127) - saskatoon, soapberry (T 09:780) - in fall saskatoon, soapberry harvested in quantity and dried/processed (TY 84:111) - women gather serviceberries in late summer and dried/processed (M 93:125-128)	TYP 43	processing / cooking sites - (T 09:780), (TY 84:110-111), (M 93:125-128)	- hearths - drying trenches - drying frames (T 09:780) - artifacts (stone, bone) (M 93:126-128)	Roast	- throughout most forested environments	- BGC zones IDF, ICH, SBPS, SBS
Plant Gathering: kinnikinnick berries - (M 93:128)	TYP 44	processing / cooking sites - (M 93:128)	- hearths (M 93:128) - drying trenches - drying racks - artifacts (stone, bone) (M 93:128)	Roast	- throughoutmost forested and subalpine areas - close to streams, lakes, wetlands	- BGC zones IDF, ICH, SBPS, SBS
Plant Gathering: tree lichen - (T 09:781) - (M 93:129-130)	TYP 45	cooking - (M 93:130)	- roasting pits - hearths - cache pits	Roast, Cache	- all forested areas with black tree lichen - Douglas fir forests and coniferous forests (M 93:130)	- BGC zones AT, ESSF, MS
Plant Gathering: whitebark (pinyon) pine nuts - (E. Charleyboy, pers.comm. 1996)	TYP 46	processing / cooking	- roasting pits	Roast	- subalpine parkland areas where whitebark pine abundant, primarily on level ground adjacent to streams, meadows - collected and roasted in Cheshi Pass, Potato Mtn., Huckleberry Mtn., near Satah Mtn (E. Charleyboy pers. comm. 1998)	- BGC zones AT, ESSF
	TYP 47	cache	- cache pits	Cache	- subalpine areas where whitebark pine abundant	- BGC zones AT, ESSF

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District						
Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Habitation: seasonal / temporary - winter (TY 84:51, 108, 120, 128-130, 246), (MC 95: 191) - ice fishing camps (F 00: 33) - summer fishing camp (MC 95: 146-147) - fishing villages occupied between May and Sept (M 93:184) - (P 63:21), (F 00:3), (M 93:23, 125, 145, 184, 188 193, 196-197), (MC 95: 146, 150, 152, 188, 190, 195, 205-206)	TYP 53	rectangular gabled houses (M 93:184, 188-189), (T 09: 775-776), (TY 84:246), (MC 95:150, 152, 205-206)	- hearths (M 93:125, 145) - cache pits (M 93:197) - housepits - human remains / tombs (MC 95:150, 198, 205-206) - mortuary poles (MC 95:206) - CMTs - drying racks (TY 84:108) - postmolds (M 93:188-189) - artifacts (stone, bone, other) - also see Fishing, Hunting, Plant Gathering	Lithic, Housepit, Cache, CMT	- terraces, knolls, benches, level ground, sheltered locations (gulleys) and S-facing aspects near major rivers and major lakes with fish values, primarily on W and N sides - near salmon fishing sites, lake fishing sites, transportation routes (TY 84:128-29) - confluence of rivers, on N banks of lakes, in good fishing locations (M 93:184) - banks of Fraser R near junction of Blackwater R (MC 95:150, 152) - at Punchaw lake (MC 95:190) - along Blackwater R grease trail near Kluskoil Lake (MC 95:198) - on Gatcho Lake (MC 95:205-206)	see TYP52
	TYP 54	base camp / temporary habitation structures (M 93:193), (TY 84:108, 120, 128-129), (MC 95:146, 151, 188, 191, 195, 198)	- hearths (M 93:125, 145), (MC 95:146, 188) - cache pits (M 93:197) - above ground cache (M 93:196), (MC 95:199) - housepits - human remains (MC 95:195) - CMTs - drying racks (TY 84:108) - postmolds (T 09:775-6), (M 93:193) - artifacts (stone, bone, other) (MC 95:147) - also see Fishing, Hunting, Plant Gathering	Lithic, Cache, CMT - also see Fishing, Hunting, Plant Gathering Trail, CMT, Lithic	- terraces, knolls, benches, level ground, sheltered locations (gulleys) and S-facing aspects near major rivers and major lakes with fish values, primarily on W and N sides - summer camps on Chilcotin R (M 93:23) - near Chilko Chilcotin junction (TY 84:130); (P 63:21) - near salmon fishing sites, lake fishing sites, transportation routes (TY 84:128-29) - plateaus and mountains (TY 84:108) - near root crops (TY 84:107) - 2 family fishing camp bank of Fraser R (MC 95:146-147) - extensive camp on Fraser R north of Cottonwood R (MC 95:151) - along Blackwater R grease trail (MC 95:191, 192, 195, 198 [near Kluskoil Lake])	see TYP52

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 55	rock shelter	<ul style="list-style-type: none"> - hearths - artifacts - rock art 	Cave, Lithic, Rockart	- caves and overhangs near water	<ul style="list-style-type: none"> - cliffs - streams, lakes
Travel / Trade - (T09:759, 777, 778, 782-783) - (TY 84:25, 144, 152-153, 163, 165, 173, 193) - (F 00:34-35, 48, 52) shells - (M 93: 23, 24, 138-140, 209-211) - (MC 95: 151, 161, 162, 166, 180, 185, 188, 190, 192, 193, 197, 204, 206, 208-210) - (W 87:88)	TYP 56	trails	<ul style="list-style-type: none"> - trails (P 63:18-19, 21-26), (T 09:784), (TY 84:1984:144, 152-53, 163, 165, 173, 193), (MC 95:151, 162, 166, 185, 188, 190, 192, 197) - CMT: bark strips along trails (MC 95:204); modified trees along trails to send signals / messages (M 93:210) - bridges (T 09:782) - artifacts (stone, bone) (T 09:782-783), (M 93:210), (MC 95:197), (W 78:88) - artifacts (trade goods) (TY 84:25), (F 00:34-35, 48, 52), (M 93:138), (MC 95:161, 162, 193, 	Trail, CMT, Lithic	<ul style="list-style-type: none"> - between habitation sites, and resource procurement sites - along shores of wetlands, lakes and in stream valleys, generally on N side - in or beside glacial drainages - eskers, mountain ridges - through passes and across drainage divides (P 63::21 ford of Chilcotin R) (F 00:48) - trade routes S of Bella Coola to Knight Inlet, Bute Inlet, Toba Inlet, Jervis Inlet travel route (T 09:784) - trade routes to coast and Lillooet area (TY 84:144, 152-53, 163, 165, 173, 193) - trails between coast and Alexandria (P 63:18-19, 21-26) - travel routes between plateau and coast (MC 95:206, 208-210) - travel route / grease trail along Blackwater R / W Road between Fraser and Bella Coola (MC 95:162, 166, 180, 185, 188, 190, 192, 197, 204) - portage route on Fraser R by Cottonwood canyon (MC 95:151) - Stone Chilcotin travel between mountains and Chilcotin R in spring and summer (M 93:23) 	<ul style="list-style-type: none"> - known trails - wetlands - all streams - all lakes - glaciofluvial drainages
	TYP 57	transit camp	<ul style="list-style-type: none"> - artifacts (stone, bone) - artifacts (trade goods) (T 09:759, 777), (F 00: 35-36), (M 93:138-139) - sweats (M 93:197) 	Lithic, CMT, Cache	- on knolls and level ground along shores of wetlands, lakes and streams, generally on N side	<ul style="list-style-type: none"> - known trails - wetlands, streams, lakes

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District						
Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
	TYP 64	sweats (M 93:198)	<ul style="list-style-type: none"> - postmolds - sweat depressions 	Other	<ul style="list-style-type: none"> - adjacent to villages, camps - adjacent to lakes, streams - on banks of streams or lakes close to villages and camps (M 93:197) 	- see TYP52, 53 Habitation
Mortuary Practices - (T 09:788) (M 93:146, 199-201) (MC 95: 150, 195, 198, 206, 213)	TYP 65	burial	<ul style="list-style-type: none"> - graves (MC 95:195) - wood structures / tombs (MC 95:150, 198, 206) - mortuary pole (MC 95:150, 206) - human remains (MC 95:206) - mounds / rock cairns - artifacts - grave goods 	Burial, Lithic	<ul style="list-style-type: none"> - near villages and encampments (MC 95:195, 198, 206, 213) - along trails and wagon roads - on prominent ridges and knolls above wetlands, streams and lakes - wherever death occurred (T 09:788) - on point on Fraser River near gabled houses (MC 95:150) 	- see TYP 1, 2, 3 (Salmon fishing), 52, 52 (Habitation)
	TYP 66	cremation - of wealthy / influential peoples (T 09:788) (M 93:146)	<ul style="list-style-type: none"> - human remains - scaffolds - artifacts - mortuary column (M 93:146, 199) 	Burial, Lithic	<ul style="list-style-type: none"> - adjacent to villages and encampments - on ridges and knolls above streams and lakes - small islands (A. Guichon pers comm 1997) and points in lakes (S. Stump pers comm 1997) - eskers and ridges above glacial ravines - cremated bones deposited in box on top of mortuary column near villages (M 93:146) - mortuary columns at village called Trak in Blackwater R area (M 93:199-201) 	- see TYP 1, 2, 3 (Salmon fishing), 52, 52 (Habitation)
Warfare - (T 09:784, 785) - (TY 84:204) - (M 93:23, 25, 37, 195-196) - (MC 95:146, 152, 170)	TYP 67	defense	<ul style="list-style-type: none"> - trenches - pits - defensive structures (M 93:195-196) - blinds - stone and bone artifacts (M 93:64) 	Other	<ul style="list-style-type: none"> - along territory / geographical boundaries - adjacent to villages and camps - adjacent to travel / trade routes - Chilcotin with Carrier along Fraser and Nechako Rivers (T 09:784), (M 93:25) - Chilcotin War on SW plateau (T 09:785), (TY 84:204) 	- see TYP52, 53, 56

Table B1: Traditional Activity/Archaeological Site Types for the Chilcotin Forest District

Traditional Activity	Site Type Code	Site Types Resulting from Activity	Potential Archaeological Evidence	Archaeological Code(s) in Model	Location of Activity	Features Used in Model Statements
Rock Quarrying - (T 09:763, 786) - (M 93:65) - (W 78:88)	TYP 58	quarry	- artifacts - rock outcrops (M 93:65), (W 78:88) - cobble source in creek (W 78:88) - ochre outcrops	Quarry, Lithic	- glassy basalt volcanic outcrops, and stream deposits below known sources - in mountainous areas such as Anahim Peak, Anahim Lake, Puntzi Lake (T 09:763) - near Anahim Peak (W 78:88) - ochre, chert, pipestone veins - pipestone vein in banks of Chilcotin R below Hanceville (T 09:786) - Pantage Lake vicinity	- lithic procurement zones - streams - cliffs
	TYP 59	lithic workshop	-artifacts (stone, bone)	Lithic	- on knolls and level ground in the vicinity of quarries, streams, camps	- lithic procurement zones - streams - slope
	TYP 60	base camp	see Habitation - seasonal	Lithic	- on knolls and level ground adjacent to meadows, streams and lakes in the vicinity of quarries	- lithic procurement zones - streams - slope
Ceremonial - (T 09:784, 789) - (F 00:4, 49) - (M 93:47, 81, 119, 198 , 207, 209-211)	TYP 61	rock carving / painting	- petroglyphs and pictographs (T 09:789), (M 93:207, 209-210)	Rockart	- on glacial boulders and rock outcrops - rock shelters - boulder S of Anahim Lake (T 09:789)	- trails - streams, lakes - cliffs
	TYP 62	tree carving	- arborglyphs (T 09:789)	Other	- trees around Anahim L (T 09:789)	- old-growth pine stands - trails
	TYP 63	sacred (transformer, offering rock)	- stone and bone artifacts (M 93:81, 119)	Other	- prominent rocks, boulders, cliffs - N side of Chilcotin R, E of the mouth of Chilko R on a flat plain below a cliff (T 09:784) - father ("lendix-teux") and dog pups turned to stone on banks of Chilcotin R (F 00:4, 49)	- not predicted

by amateur and professional archaeologists on an ad hoc basis and which are not necessarily described in permit reports.

The locations of the survey areas in the judgemental surveys noted above were selected on a judgemental or non-random basis, with the specific size and shape of survey areas not being predetermined or fixed. In many of these studies, only those areas considered to have the highest potential for having archaeological sites were selected for survey. The actual areas surveyed in these projects are rarely defined clearly in the reports. Methodologies were also highly variable, ranging from brief reconnaissance to intensive survey. These projects often did not employ subsurface testing.

Although judgemental inventories represent a relatively low percentage of all of the projects undertaken in the CFD, they have yielded the greatest overall number of sites per project type, as well as the greatest frequency of sites per project. In eight studies, a minimum of 215 sites were identified for an average of approximately 27 sites per project. However, it must be cautioned that judgemental research inventories do not provide representative data on the relative frequency, density and distribution of archaeological sites throughout the CFD. As a result, judgemental research inventories are neither systematic nor are the results necessarily representative of the area being examined. Furthermore, most of these studies only provide limited information on survey coverage and intensity which could be useful for this AOA. Despite their limitations, judgemental research inventories are valuable in that they provide baseline data on the types of sites which can be expected in the CFD, and the types of landscape features often associated with these sites. Many of these projects were also conducted in areas of high archaeological sensitivity, and therefore provide information on significant clusters of sites.

Systematic Research Inventories

Systematic research inventories are defined as those research-oriented projects which systematically inventory the archaeological resources of a representative sample of a defined study area. The methodology of these projects always includes intensive, systematic survey coverage following closely-spaced survey transects. Most of these projects include systematic or judgemental subsurface testing. Some systematic surveys are designed as “probabilistic” studies in which a statistically representative sample of randomly selected “quadrats” or sampling units is selected. The sampling units are of predetermined size and shape, and are randomly selected from one or more “strata” or subdivisions of the study area. Other research inventories are not specifically designed to produce statistically significant results, but the information from these projects can generally provide comparative data on site density, frequency, and distribution.

A number of significant systematic research inventories have been undertaken in the Chilcotin Forest District (Table C2). All of these projects involved an inventory of sampling units randomly selected from a defined study area. However, the way that the study area was stratified, how sampling units were selected, and the size of the sampling units varies from project to project. For example, the Dean River, Taseko Lakes, and Chilko River AIS projects used 25 ha sampling units, the Eagle Lake and Potato Mountain studies used 16 ha sampling units, and the Homathko River project used 8 ha sampling units. Although the selection of sampling units in each strata in the Eagle Lakes and Dean River studies was random, a greater number of units were selected in the “higher potential” grassland or lakes/rivers strata. In the Chilko River AIS, an equal number of units were

APPENDIX C: Archaeological Research

Review of Archaeological Survey Coverage

A comprehensive review of previous archaeological inventory projects in the Chilcotin Forest District (as of December 31, 1997) was undertaken in order to evaluate the extent and intensity of survey coverage in the district. For this review, archaeological projects were grouped into four categories defined on the basis of the objectives of the study and the survey strategies employed. The four categories include: (1) judgemental research inventory projects, (2) systematic research inventory projects, (3) development Archaeological Impact Assessment (AIA) projects, and (4) forestry-related AIAs. Excavation reports were not considered for this analysis, unless they also incorporated a survey component. An analysis of the results of this review of survey coverage, and recommendations for future inventory priorities, is found in Appendix I.

Judgemental Research Inventory Projects

Judgemental archaeological inventory projects are defined as those research-oriented studies which were not related to a specific development project, and which did not employ systematic survey of randomly selected survey units. Table C1 lists major judgemental inventories for which reports exist.

Table C1: Selected Judgemental Research Inventory Projects in the CFD					
Permit	Project	Year	Reference	Biogeoclimatic Zone (see Appendix F)	# of Sites
1969-013 1971-007	Anahim Lake	1973	Wilmeth 1978	SBPSxc	3(?)
non-permit	Obsidian Creek	1976	Nelson and Will 1976	SBPSmc, MSxv	1
1976-011	Obsidian Creek	1976	Apland 1979	SBPSmc, MSxv	20
1979-014	Eagle Lake/ Chilko River	1979	Matson et al. 1980	IDFdk4, SBPSxc	103
1979-021	Dean River	1979	Eldridge and Eldridge 1980	SBPSmc, SBPSxc	37
1984-014	Fishtrap Lake/ Potato Mountain	1984	Alexander et al. 1985	ATp, IDFdk4, ESSFxv	31
1998-214	Chilko River AIS	1997	Arcas 1998a	SBPSxc, IDFdk4	8
non-permit	CFD AOA	1997	Appendix D of this report	IDFdk4, MSxv SBPSxc	12
TOTAL (*Minimum Number)					215*

Some of these judgemental inventories were part of larger systematic projects. Please note that this table only includes research or permit projects and does not include those sites recorded in the CFD

Despite the variations in methodology, the intensity of overall survey and testing coverage for all the systematic studies was considered approximately equal for the purposes of this analysis.

The seven systematic research inventories conducted in the CFD through 1997 produced a total of 174 sites, or approximately 25 sites per project. In total, 2372 ha were surveyed for an overall site density of 7.3 sites/km². However, the site density between projects varied greatly, ranging from 2.6 to 13.2 sites/km². Although this variation in site density may be partially due to differences in survey and subsurface testing strategies, it is likely that this also reflects differences in site density in the different study areas. Despite differences in methodology, systematic research inventories provide the most reliable and most representative data for analyzing site frequency, density, and distribution. As such, the results of systematic inventories are the most useful for developing and testing models of archaeological potential. However, it should be noted that the study areas for these projects have largely focussed on a few biogeoclimatic zones, and representative data for all zones throughout the CFD is currently unavailable. A brief analysis of systematic survey coverage by biogeoclimatic zone and other variables is provided in Appendix I.

Development AIAs

Development AIAs are defined as those archaeological inventories undertaken to identify all sites within a proposed development property in order to assess potential impacts to archaeological resources from land-altering activities. For the purposes of analysis, forestry-related developments represented a separate analytical category. In the CFD, development AIAs have been conducted for proposed roads and highways, commercial and residential developments, recreation sites, proposed hydro developments, wetland restorations, and proposed mines. The study areas for development AIAs are restricted to the boundaries of the subject properties. The methodology of these projects generally includes complete or relatively comprehensive survey coverage of a defined area. Most of these projects also included intensive or judgemental subsurface testing. Table C3 lists selected major development AIAs conducted in the CFD through 1997.

Table C3: Selected Development AIA Permits Issued in the CFD

Permit	Location	Reference	Biogeoclimatic Zone (see Appendix F)	# of Sites
1964 (non-permit)	Redstone, Anahim Lake, Chilko Lake, Horn Lake, Puntzi Lake,	Mitchell 1964, 1970a, 1970b	IDFdk4, SBPSxc	40+
1976-005	Tatlayoko Lake, Anaham	Rafferty 1976	IDFdk4	1
1977-017	Raven Lake, Alexis Lake, Two Lake, Vedan Lake	Winram and Thomas 1977	IDFdk4, SBPSxc	2
1978-006	Alexis Creek	Germann 1979a	IDFdk4	n/a
1979-006	Anaham, Alexis Creek, Chilko Lake, Anahim Lake	Germann 1979b	IDFdk4, SBPSxc	38
1980-006	Various Locations	Howe 1981	n/a	n/a

initially selected from each strata, but more units were actually surveyed in certain strata than in others. These types of differences in the research design and sampling strategy can make direct comparisons between projects problematic.

Table C2: Selected Systematic Research Inventories Conducted in the CFD

Permit	Project	Year	Reference	#/size of Units	ha	Biogeoclimatic Zone (see Appendix F)	# of Sites	Sites /km ²
1979-021	Dean River	1979	Eldridge and Eldridge 1980	31* @ 25 ha	775	SBPSmc, SBPSxv	34	4.4
1979-014	Eagle Lake	1979	Matson et al. 1980	30 @ 16 ha	480	IDFdk4, SBPSxc, MSunc	38	7.9
1982-028	Homathko River	1982	Blacklaws et al. 1983	24 @ 8 ha	192	IDFunc	5	2.6
1983-007	Eagle Lake	1983	Matson and Magne 1984	7 @ 16 ha	112	IDFdk4, SBPSxc	12	10.7
1983-007	Taseko Lakes	1983	Magne 1984	11 @ 25 ha	275	MSunc, ESSFxv	16	5.8
1985-011	Potato Mountain	1985	Alexander and Matson 1987	18 @ 16 ha	288	ATp, ESSFxv	36	12.5
1998-214	Chilko River AIS	1997	Arcas 1998a	10 @ 25 ha	250	IDFdk4, MSxv, SBPSxc	33	13.2
TOTALS					2372		174	7.3
* Excludes quadrats which were not systematically surveyed.								

Field methodologies utilized in the systematic research inventories conducted in the CFD also varied from project to project. In all cases, the field methodology included systematic visual inspection following traverses spaced at regular intervals, ensuring relatively complete coverage of the entire sampling unit. Traverse intervals remained relatively constant in some projects, while in others traverse intervals varied according to the slope and terrain. Also, the width of crew spacing within traverses varied between projects, resulting in different levels of intensity in survey coverage. In some cases the intensity of survey coverage differed substantially for certain quadrats within a single project. For example, in the Dean River study, the report states that thirty-six quadrats were inventoried, but in reality two of these quadrats were not inspected at all, while three others received only limited judgemental survey coverage. Likewise, the subsurface testing strategy varied substantially from project to project. For example, in the Dean River study, systematic subsurface testing was conducted at 50 m intervals throughout each quadrat, the Chilko River inventory used variable degrees of judgemental subsurface testing, and the Eagle Lake, Taseko Lakes, and Potato Mountain studies did not utilize any subsurface testing at all. Although several studies did not utilize any subsurface testing, in most cases, surface exposures were considered adequate for locating sites.

Table C3: Selected Development AIA Permits Issued in the CFD

1981 (Ministerial Order)	Alexis Creek, Dean River	Howe 1982	IDFdk4, SBPSxc	2
1982-028	Homathko River, Tatlayoko Lake	Blacklaws et al. 1983	IDFdk4, IDFunc	24
1983-028	Alexis Creek	Bussey 1983	IDFdk4	2
1989-108	Anahim Lake	Zacharias 1990	SBPSxc	0
1990-106	Chezacut	Bussey 1991	SBPSxc	11
1993-095	Fish Lake	Tyhurst 1995	SBPSxc	18
1994-058	Anahim Lake	Zacharias 1994	SBPSxc	0
1995-054	Chilanko River	Spafford and Klassen 1995	IDFdk4	2
1996-135	Chilko Lake, Fishem Lake	Yip 1996	IDFunc	3
1996-165	Anahim Lake, Charlotte Lake, Pyper Lake, Tatla Lake	Metz and Klassen 1997	IDFdk4, SBPSxc	5
1997-266	Chilko Lake	Arcas 1998b	IDFunc	0
TOTAL				148

In the 17 AIAs, a minimum of 148 sites were identified for an average of almost nine sites per project. The relatively low number of sites identified per project is largely a function of the small size of most of the development properties. The methodology of development AIAs produces relatively reliable site density information for the defined study areas, which can be extrapolated to similar settings elsewhere. However, most developments occur in areas of higher potential in favourable environments adjacent to streams and waterbodies. As a result, development AIAs do not produce representative survey data, and thus provide limited information on site density and distribution for the CFD as a whole. Similar to judgemental research inventories however, the results of development AIAs are valuable in that they provide baseline data on the types of sites and site settings which can be expected in the CFD.

Forestry-Related AIAs

Forestry-related AIAs include all of those archaeological inventories of "operation areas" relating to forestry activities, including the assessment of proposed cutblocks, access roads, and silviculture areas. Forestry-related AIAs were not conducted in the CFD prior to 1994. A list of Archaeology Branch permits issued from 1994 to the end of 1997 was reviewed in order to identify all forestry-related AIAs conducted in the CFD. As of December, 1997, twenty-four permits had been issued for forestry-related AIAs in the CFD. One additional non-permitted forestry project has also been conducted (Table C4). Copies of all completed and available reports for these AIAs were obtained and reviewed, and a database listing all inspected operation areas and results was compiled (see below).

Table C4: Selected Forestry AIA Permits Issued for the CFD (1994 to August 1997)

Permit	Project	Permit Holder	Reference	Biogeoclimatic Zone (see Appendix F)	# of Sites
1994 (non-permit)	MoF Small Business	n/a	Friesen 1994	SBPSmc	0
1994-075	Weldwood	Wilson	I.R. Wilson 1994	IDFdk4 SBPSxc	0
1994-154	All Forestry Licensees	Howe	Arcas 1995	IDFdk4	2
1994-156	Yun Ka Whu'ten	Darwent	Darwent 1994	MSxv SBPSxc	0
1995-059	Yun Ka Whu'ten	Darwent	Darwent and Darwent 1995	MSxv SBPSxc	1
1995-071	Riverside	Bailey	Klassen 1996b	SBPSxc	0
1995-073	All Forestry Licensees	Stryd	Arcas 1995, 1996	IDFdk4, IDFXm, MSxv, SBPSxc	38
1995-107	MoF Small Business, MoF Road, MoF Woodlots	Franck	Klassen and Merchant 1996, Klassen and Spafford 1996, Klassen 1996a	IDFdk4 MSxv SBPSxc	16
1995-181	MoF Small Business	Middleton	Middleton 1995	ESSFxv MSxv SBPSxc	0
1995-207	Riverside	Rousseau	Klassen 1996b	MSxv SBPSxc	4
1995-224	TimberWest	Rousseau	Spafford 1997a	SBPSxc	9
1995-270	Weldwood	Rousseau	Spafford 1997b	IDFXm IDFdk4 SBPSxc	19
1996-034	Yun Ka Whu'ten	Walde	Walde 1996	ESSFxv MSxv SBPSmc SBPSxc	0
1996-048	All Forestry Licencees	Preckel	Arcas 1997	IDFXm IDFdk4 IDFXm MSxv SBPSdc SBPSxc	44
1996-117	Tsi Del Del	Rousseau	Feast and Klassen 1997	MSxv SBPSxc	2

and the proportion of each operation area surveyed, it is impossible to accurately calculate the actual area surveyed in forestry-related AIAs.

Although none of the permit reports specifically indicated the actual number of hectares surveyed in each cutblock, it was possible to provide a rough estimate of the extent of survey in each operation area. This was estimated on the basis of the relative extent and intensity of survey undertaken in each operation area as indicated in the permit reports. In the following database, each cutblock was classified into one of three relative levels of survey coverage: Full AIA, Partial AIA, and Field Reconnaissance AIA (Table C5). In short, a Full AIA involved combined intensive and judgemental survey of 50% to 100% of the operation area, a Partial AIA involved judgemental or intensive survey of 25% to 50% of the operation area, and a Field Reconnaissance AIA entailed judgemental survey of less than 25% of the operation area. By multiplying the area of each cutblock by the estimated average extent of survey coverage (i.e., approximately 75% for Full, 35% for Partial, and 15% for Field Reconnaissance), it would be possible to roughly estimate the total survey coverage under each permit. Unfortunately, the lack of accurate data on the area of each cutblock prevents this estimate from being made at present. However, eventually linking the database to an updated GIS coverage of forestry operation areas will make this calculation possible.

For this review of survey coverage, the total area surveyed during forestry AIAs in each biogeoclimatic zone and ecosection was to be calculated. Again, the lack of accurate and comprehensive data on cutblock areas and actual hectares surveyed makes this calculation currently impossible. Nonetheless, Table C4 indicates which biogeoclimatic zones the operation areas for each project were located within. This information is useful for evaluating inventory priorities, as described in Appendix I.

Overall, forestry AIAs have had a major impact on the archaeological database for the study area. In total, 191 sites were identified under the 24 forestry-related permits and one non-permitted forestry study conducted in the CFD for an average of approximately 7 sites per project. Nearly 45% of all archaeological projects in the CFD have been forestry related, and nearly 23% of all recorded sites were identified in forestry AIAs. The total land area surveyed in these studies also vastly exceeds the area covered in other types of projects, although much of this area received low intensity survey coverage. Comprehensive and accurate data on the actual area surveyed in these projects is unavailable, but the total area of all cutblocks which received at least some survey coverage probably exceeds 30,000 ha. Without accurate data on total surveyed area, calculations of site density in forestry-related inventories cannot be made. Nonetheless, the density of sites identified in forestry related projects is apparently lower than in other types of projects. This is largely because most of the area surveyed in forestry projects are generally lower in potential than the areas surveyed in other projects. For example, judgemental surveys generally focus on only the highest potential areas along major rivers and lakes, while most cutblocks are set back from major aquatic features.

The highly variable nature of the methodology used in forestry AIAs, and the lack of accurate data on total survey coverage, makes comparisons between forestry AIAs and other types of inventories problematic. Despite the limitations of the current data, forestry related surveys are useful for this AOA study in that they help indicate where sites are not found as well as where they are found. They have also provided a vastly expanded site dataset, particularly in regions and

Table C4: Selected Forestry AIA Permits Issued for the CFD (1994 to August 1997)

1996-119	Riverside	Klassen	Klassen 1997	MSxv SBPSxc	16
1996-148	MoF Small Business	Rousseau	Mitchell 1997	IDFdk4 MSxv SBPSxc	4
1996-196	Riverside	Rousseau	Will, Spafford, Klassen, and Rousseau 1997	MSxv, SBPSxc	7
1996-243	MoF Small Business	Middleton	Middleton 1996	MSxv, SBPSmc, SBPSxc	0
1996-260*	MoF Woodlots	Eldridge	Messier and Eldridge 1997	n/a	3
1997-097	All Forestry Licensees	Preckel	Arcas 1998c	IDFdk4, IDfxm, MSxv, SBPSxc	21
1997-135*	MoF Small Business	Middleton	Middleton 1997	n/a	3
1997-186* 1997-187*	TimberWest/ Riverside	Mitchell	Mitchell 1997b	n/a	1
1997-203*	MoF Small Business	Carriere	Carriere 1997	n/a	1
TOTAL					191

*Final reports for these permits were unavailable at the time of analysis of biogeoclimatic zones for the model (Dec. 1997). Accordingly, site totals differ from that in the **Final Report**.

The methodology employed in forestry-related AIAs varies widely within and between projects. For the most part, systematic or intensive survey traverses were not employed, and operation areas inspected in the forestry AIAs were not always completely surveyed. In many cutblocks, for example, only block boundaries and a few judgementally selected traverses through the centre of the block were surveyed. The intensity of survey coverage also varied from operation area to operation area within and between projects. For example, some operation areas were completely surveyed regardless of their archaeological potential, while other operation areas were surveyed and tested only within limited areas of archaeological potential. Subsurface testing strategies were exclusively judgemental in all projects, and the frequency and spacing of tests was extremely variable. Although subsurface testing was employed to some degree in all projects, subsurface testing was not employed in many individual operation areas.

One objective of this archaeological review was to determine the total area (in hectares) of survey coverage in each forestry AIA project. However, the total area surveyed in each project was impossible to determine. Many of the reports did not list the total hectares of the individual operation areas, nor did they indicate what proportion of each operation area was surveyed. A comprehensive GIS coverage of all forestry operation areas would include the total area of each cutblock, but such a coverage is not currently available. Without complete data on the actual size of each operation area,

environmental zones where little work has been previously undertaken. A more detailed analysis of forestry survey coverage is provided in Appendix I.

Table C5: Relative Levels of Forestry Survey Coverage

Survey Type	Definition	Methodology
Full AIA	all cutblocks/roads which received a "full" AIA as recommended and defined by the Archaeological Review (Klassen and Stryd 1996), or intensive survey coverage of the entire cutblock/road	<ul style="list-style-type: none"> shovel testing in areas of potential, or intensive inspection in areas of potential with good ground exposure systematic transects (i.e., along cruise lines) or judgemental transects through more than 50% of the block includes blocks with full survey coverage but no shovel testing because low potential was observed also includes "random sample" blocks with full coverage
Partial AIA	all cutblocks/roads which received a "partial" AIA as recommended and defined by the Archaeological Review (Klassen and Stryd 1996), or intensive survey coverage of less than 50% of the cutblock/road	<ul style="list-style-type: none"> shovel testing in areas of potential, or intensive inspection in areas of potential with good ground exposure systematic transects (i.e., along cruise lines) or judgemental transects through 25% to 50% of block includes blocks with partial survey coverage but no shovel testing because low potential was observed also includes "random sample" blocks with partial coverage
Field Reconnaissance	all cutblocks/roads which received a "field reconnaissance" AIA, or judgemental survey coverage of less than 25% of the cutblock/road	<ul style="list-style-type: none"> no shovel testing anywhere in cutblock judgemental transects covering less than 25% of cutblock, or restricted to perimeter and centerline also includes "random sample" blocks with field reconnaissance

Forestry AIA Database

Table C7 is a printout of the Forestry AIA Database compiled as part of this AOA, and Table C6 is the key to the database fields. This database is also available as a digital Microsoft® Access 2.0 file. The database contains information on all forestry-related AIAs conducted in the CFD under permits issued from 1994 to 1996. At the time that this database was compiled, the results of forestry AIAs conducted under permits issued in 1997 and later were not available. The database identifies all cutblocks and roads for which AIAs have been conducted, and includes the Heritage Inspection Permit, the extent of archaeological impact assessment conducted, and the sites identified. Please note that the area in hectares for each cutblock represents the total area of the block, and NOT the actual area surveyed. Unfortunately, the area in hectares was not available for all operation areas (see Appendix C).

The digital Microsoft® Access 2.0 database is intended to be linked in a GIS to a comprehensive digital consolidated development plans for the CFD. This linkage will allow a variety of spatial analyses, including comparisons of the approximate area surveyed to other digital information, such as archaeological potential, biogeoclimatic zone, and traditional territory. The database used in conjunction with a GIS can also be used to create maps showing areas surveyed, and will be useful in determining the extent of survey coverage and data gaps. At the time of this writing, a comprehensive, accurate, and up-to-date digital development plan for the CFD was not available.

As the current database only covers the years 1994 to 1996, the database and GIS linkage should be updated annually.

Table C6: Key to the Chilcotin Forest District Forestry Database Fields

Code	Description
ID	Identification number (field not shown in Table C7)
Permit	Heritage Inspection Permit under which archaeological impact assessment (AIA) was conducted
Firm	Company or individual undertaking the work (not necessarily the permit-holder)
Year	Year of archaeological impact assessment
Proponent	Forestry licensee for which the AIA was conducted
FL/TSL	Forest license or timber sale license of forestry development area
CP	Cutting permit of forestry development area
BLK/RD	Cutblock or road number
Ha	Total area of cutblock or road in hectares (if known from permit report)
M	Length of road (field not shown in Table 7)
AIA	The extent of AIA conducted on blk/rd
Coverage	Amount of coverage in % (if known) (field not shown in Table 7)
Sites	number of archaeological sites identified during AIA (field not shown in Table 7)
Borden	Borden numbers of all identified sites
Map	Block/road found on paper development plan (yes/no)
NTS	NTS map number for cutblock/road (field not shown in Table 7)
TRIM	TRIM map number for cutblock/road
Comments	Notes concerning the location/area/etc. of cutblocks as they appear on the development plan (field not shown in Table 7)

Table C7: Chilcotin Forest District AOA - Forestry Database 1994-1996 - Selected Fields											
Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-073	Arcas	1995	Timberwest Forest	A20019	07Y	10		Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	10Y	1	60	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	15Y	1	47.1	Full	FcRs 1	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	15Y	2	31.4	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	15Y	3	29.5	Full	FcRs 2	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	15Y	6	36	Full	FcRs 3	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	1	20.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	2	12.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	4	4.1	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	6	5.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	8	27.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	22Y	9	23.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	23Y	1	43.8	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	23Y	2	52.3	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	23Y	3	46.5	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	29Y	1	39.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	1	50.3	Full	FcRv 2	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	2	13.3	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	3	34.2	Full	FcRv 3 - 5	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	5	22.8	Full	FcRv 6	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	6	35	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	7	48.5	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	31Y	8	29.4	Full	FcRv 7 - 8	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	1	16.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	2	15.3	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	3	10.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	4	9.4	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	5	5.9	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	6	3.2	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	7	66.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	8	37.5	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	41Y	9	29.4	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	1	20	Full		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	2	59	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	3	8	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	5	49.2	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	6	27.2	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	7	25.5	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	49Y	8	22.5	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	1	19.6	Full		N	set 7
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	2	29.7	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	3	120.7	Full	FcRx 12 - 19	Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	4	38.8	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	5	31.3	Full	FcRx 20 - 21	Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	6	2.8	Full		N	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	7	13.2	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	8	13.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A44077	67Y	9	7.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	751	9	28.5	Full	FcRv 9	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	978	1	28.7	Partial	EkRu 1	Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	978	2	49.8	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	978	3	42.7	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	979	1	43.8	Partial		Y	92O.054
1995-073	Arcas	1995	Timberwest Forest	A20019	979	2	46.3	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	979	3	37	Partial		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	X02	2	35.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	X02	3	47.2	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	X02	4	27	Full	EjRu 2	Y	92O.054
1995-073	Arcas	1995	Timberwest Forest	A20019	X02	6	33.6	Full		Y	
1995-073	Arcas	1995	Timberwest Forest	A20019	X03	1	38.3	Full		Y	92O.053
1995-073	Arcas	1995	Timberwest Forest	A20019	X03	3	25.7	Full		Y	92O.053
1995-073	Arcas	1995	Timberwest Forest	A20019	X03	4	38	Full		Y	92O.053
1995-073	Arcas	1995	West Fraser Mills	A20020	003	22	7.74	Full	FcRs 6	Y	92B.045
1995-073	Arcas	1995	West Fraser Mills	A20020	984	1		Partial	FdRw 6	Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	984	2		Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	984	3		Full	FdRw 4 - 5	Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	984	4		Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-073	Arcas	1995	Lignum Ltd.	A45026	772	2	70	Partial		Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	772	3	130	Full		Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	1	40.9	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	3	14.4	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	4	8.4	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	5	38.6	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	6	57	Partial		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	8	18.2	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	9	46.7	Partial		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	10	48	Full		Y	
1995-073	Arcas	1995	Lignum Ltd.	A20018	817	11	52.3	Partial		Y	
1995-073	Arcas	1995	Ministry of Forests	A32375		1	6.1	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A32375		2	14.8	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A32376		1	11.4	Full	FbRu 1	Y	
1995-073	Arcas	1995	Ministry of Forests	A32376		2	7.9	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A39399		1	11	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A39399		2	14.4	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A39399		3	5	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46694		1	22.3	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46694		2	14	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46695		5	8	Full	FaRs 1 - 2	Y	
1995-073	Arcas	1995	Ministry of Forests	A46695		6	4.9	Full	FaRs 3	Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		1	4.2	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		2	4.6	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		3	4.1	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		4	5.2	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		5	5.7	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		6	18	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		7	7.4	Full		Y	
1995-073	Arcas	1995	Ministry of Forests	A46703		8	3.9	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	735	1	66.9	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	735	2	30.5	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	735	5	31.6	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	735	7	23.7	Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-073	Arcas	1995	West Fraser Mills	A20020	984	5		Partial		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	1	26.3	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	2	40	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	3	45.3	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	4	34.7	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	5	31.6	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	6	52.6	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	747	7	38.4	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	750	1	60.3	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	750	2	60.7	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	750	3	46.5	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	750	4	59	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	750	4A	10.9	Partial		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	751	1	24.1	Full	FcRq 2 - 3	Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	751	2	13.8	Full	FcRq 1	Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	751	3	6.8	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	754	1	32	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	754	2	60	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	754	3	24	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	1	40	Partial		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	2	31.1	Partial		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	3	65.6	Full	EIRs 9	Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	4	57.5	Partial		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	5	59.5	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	758	6	59	Partail		Y	
1995-073	Arcas	1995	West Fraser Mills	A45025	964	2		Partial		Y	93B.052
1995-073	Arcas	1995	West Fraser Mills	A45025	964	3		Partial		Y	93B.052
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	1	147.5	Full	FbRv 7	Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	2	37.4	Full		Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	3	43.3	Full		Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	4	23.3	Full	FbRv 8	Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	5	55.9	Full	FbRv 9	Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	771	6	69.7	Full		Y	93B.023
1995-073	Arcas	1995	Lignum Ltd.	A45026	772	1	303	Full		Y	93B.023

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-207	Antiquus	1995	Riverside F.P.	A20016	736	3	37.8	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	736	4	35.6	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	736	7	51.9	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	736	8	67.7	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	736	9	63.7	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	751	1	103.9	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	751	3	35.8	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	751	4	4.7	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	759	1	88.4	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	759	2	76.5	Partial		Y	
1995-	Antiquus	1995	Riverside F.P.	A20016	759	3	63.5	Partial	FcSd 6 - 7	Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	759	4	44.6	Partial		Y	
1995-207	Antiquus	1995	Riverside F.P.	A20016	759	5	50.9	Full		Y	
1995-207	Antiquus	1995	Riverside F.P.	A45027	952	8	13.5	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	1	51.2	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	2	15.6	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	3	17.4	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	4	15.7	Full		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	5	8.5	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	6	6.8	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	7	27.2	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	8	11.9	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	9	4.1	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	10	18.4	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	11	2.9	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	12	7.2	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	14	1.1	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	15	1.3	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	16	7.9	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	17	8.2	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	18	8.1	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	19	9.3	Partial		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	20	16.5	Full		N	93C.049/.039
1995-207	Antiquus	1995	Riverside F.P.	A45027	953	21	1.5	Full	FcSb 1	N	93C.049/.039

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	5	8	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	6	18.8	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	6A	24.5	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	7	12.7	Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	7A	30.4	Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	10		Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	11		Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	995	1	26.6	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	995	2	105.3	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	995	2A	17.5	Partial		N	93C.017
1995-181	Middleton	1995	Ministry of Forests	A48111		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48111		1	99.2	Partial		Y	
1995-181	Middleton	1995	Ministry of Forests	A51829		1	31.5	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A51829		2	12.95	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		Rd	25.3	Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48112		1	58.9	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		2	17.6	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		3	14.4	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		4	4.3	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		5	19.3	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48112		6	37.1	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48113		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48113		1	148.6	Partial		Y	
1995-181	Middleton	1995	Ministry of Forests	A48114		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48115		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48116		1	99.4	Partial		Y	
1995-181	Middleton	1995	Ministry of Forests	A48117		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A48117		1	77.1	Partial		Y	
1995-181	Middleton	1995	Ministry of Forests	A48117		2	49.8	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48117		3	24	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A48119		Rd		Full		N	
1995-181	Middleton	1995	Ministry of Forests	A39414		1	30.4	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A39414		2	13.8	Full		Y	
1995-181	Middleton	1995	Ministry of Forests	A39415		1	53.6	Full		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-207	Antiquus	1995	Riverside F.P.	A45027	957	1		Partial	FbSa 3	Y	
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	1	31.7	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	2	74.5	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	3	20.9	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	4	19.3	Full		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	6	103.8	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	7	16.9	Full		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	8	41.1	Full	FbSa 4	N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	9	78.3	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	10	2.7	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	11	121.6	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	12	12.1	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	958	13	7.8	Partial		N	93C.030
1995-207	Antiquus	1995	Riverside F.P.	A45027	961	1	6.28	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	961	2A	13.2	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	961	2B	5.9	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	961	3	17.6	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	961	3A	1.7	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	962	1	5.5	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	962	2	41.9	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	962	3	98.8	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	962	7	52.3	Partial		N	93C.039/029
1995-207	Antiquus	1995	Riverside F.P.	A45027	968	1	119.4	Full		N	93C.029
1995-207	Antiquus	1995	Riverside F.P.	A45027	968	1A	3.7	Partial		N	93C.029
1995-207	Antiquus	1995	Riverside F.P.	A45027	968	11	47.3	Full		N	93C.029
1995-207	Antiquus	1995	Riverside F.P.	A45027	968	12	60.8	Full	FbSb 1	N	93C.029
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	1	18.1	Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	1A	7.2	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	1B	5.2	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	1C		Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	2	21.7	Partial		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	2A	7.2	Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	3	16.3	Full		N	93C.017
1995-207	Antiquus	1995	Riverside F.P.	A45027	992	4	6.7	Partial		N	93C.017

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
n/a	Friesen	1994	Ministry of Forests	A35854		405	40.4	Partial		Y	
n/a	Friesen	1994	Ministry of Forests	A46492		1	46.8	Partial		Y	
n/a	Friesen	1994	Ministry of Forests	A46492		2	35.5	Partial		Y	
n/a	Friesen	1994	Ministry of Forests	A46492		3	34.9	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39395		1	6	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39395		2	5.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39395		3	13.3	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39396		1	85.8	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39396		2	35.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39429		1	43	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A39430		1	54.3	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48158		A	56.7	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48160		1	53.1	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48160		2	67.7	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48160		3	52	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48160		4	34	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48160		5	7.3	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48172		1	30.3	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48172		2	21.3	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48172		3	33.1	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48172		4	21.9	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		1	30	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		2	6	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		3	39	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		4	92	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		5	18	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		6	24	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48174		7	52	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48177		1	7.9	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48177		A	1.5	Partial		N	
1995-107	Antiquus	1995	Ministry of Forests	A48177		B	11.4	Partial		N	
1995-107	Antiquus	1995	Ministry of Forests	A48177		C	13.1	Partial		N	
1995-107	Antiquus	1995	Ministry of Forests	A48184		1	40.1	Partial		N	
1995-107	Antiquus	1995	Ministry of Forests	A48184		2	52.4	Partial		N	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-107	Antiquus	1995	Ministry of Forests	A48185		1	11.6	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48185		2	23	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48185		3	12.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48185		4	9.5	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48185		5	22	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48197		1	10.3	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48197		2	46.7	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48197		3	11.3	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		1	48.8	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		3	41.4	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		4	10.5	Full		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		5	44.5	Full		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		6	17	Full		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48199		7	18.5	Partial		N	93B.011/001
1995-107	Antiquus	1995	Ministry of Forests	A48200		1	0.9	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		2	1.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		3	20.1	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		5	180.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		6	9.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		7	3.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48200		8	154.2	Full	FbSa 5	Y	
1995-107	Antiquus	1995	Ministry of Forests	A48204		1	154.7	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48204		2	9.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48205		1	28.5	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48205		2	65.8	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48205		3	11	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48206		1	117.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48206		2	115	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48208		1	66.9	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48208		2	58.1	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A48208		3	45.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51021		1	18.1	Full	FaSa 1, FaSa	Y	
1995-107	Antiquus	1995	Ministry of Forests	A51021		2	15.2	Full	FaSa 2	Y	
1995-107	Antiquus	1995	Ministry of Forests	A51022		1	7.5	Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-107	Antiquus	1995	Ministry of Forests	A51022		2	13.7	Full	FaRx 5	Y	
1995-107	Antiquus	1995	Ministry of Forests	A51022		3	1.7	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51602		2	77.6	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51602		3	80.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51603		1	20.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51603		2	64	Full	FaSc 1, FaSc	Y	
1995-107	Antiquus	1995	Ministry of Forests	A51603		3	22.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51603		4	6.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51603		5	26.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		1	5.6	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		2	12.8	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		3	11.2	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		4	26.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		5	8.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		6	32.8	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		7	126	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		8	21.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		9	105.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51604		10/12	27	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51605		1	45.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51605		2	222.8	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51605		3	66	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51605		4	6.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51606		1	39.6	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51606		2	75.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51606		3		Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51607		1	91.6	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51607		2	70.4	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51607		3	9.2	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51609		2	52.4	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51610		1	6.5	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51610		2	26.1	Full		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51610		3	44.2	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51610		4	38.7	Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-107	Antiquus	1995	Ministry of Forests	A51610		5	96.9	Partial		Y	
1995-107	Antiquus	1995	Ministry of Forests	A51610		6	112	Partial		Y	
1994-156	Norcan	1994	West Chilcotin F.P.		53	401				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		53	401B				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		53	403				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		53	404				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		54	419				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		54	420				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		54	422				Y	
1994-156	Norcan	1994	West Chilcotin F.P.		36Y	2, 3		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	2		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	3		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	7		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	9		Partial		Y	93C.034
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	10		Partial		Y	93C.034
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	11		Partial		Y	93C.034
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	26	12		Partial		Y	93C.034
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	39	304A		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	39	304E		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	39	305		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	49	391,394		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	451		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	453		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	470		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	472		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	477		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	478		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	50	479		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	402		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	403		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	404		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	412		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	414		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	415		Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	57	428		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	3		Partial	FcSh 33	Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	4		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	5		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	6		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	10		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	126		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	128		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	155		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	156		Partial		Y	
1995-059	Norcan	1995	West Chilcotin F.P.	A47409	65	157		Partial		Y	
1995-107	Antiquus	1995-96	Ministry of Forests	Tatlayoko Lk		WL	600	Full	EISd 1 - 9	N	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	42	331	63.7	Full		Y	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	42	344	46.5	Full		Y	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	42	346	42	Full		Y	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	42	357	11.5	Full		Y	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	42	343	69	Full		Y	
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	10	WL	600	Full		N	
1996-148	Antiquus	1996	Ministry of Forests	A45308		22	15.7	Full	FaSf 3 - 4	Y	
1996-148	Antiquus	1996	Ministry of Forests	A45308		51	109.7	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45308		52B	3.9	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45308		52C	7.6	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45308		52	56.4	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45308		Rd		Full		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		12B	9.4	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		70	2.7	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		71	1.8	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		72	4	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		74	2.7	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45309		75	5.3	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45310		32	18.2	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45310		32A	34.7	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45310		32B	5.8	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A45310		37	6	Partial		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-148	Antiquus	1996	Ministry of Forests	A48153		8	11.8	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	A54310		310	18	Partial		Y	
1996-148	Antiquus	1996	Ministry of Forests	Cochin Lk		WL		Full	EkSc 4, EkSc	N	
1996-048	Arcas	1996	Lignum Ltd.	A45026	981	3	44.9	Full		Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	981	5	48.3	Full		Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	981	8	216.7	Full	ElSf 2	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	1	136	Full	FbSa 8	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	2	68	Full	FbSa 6 - 7	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	4	92	Full	FbSa 9	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	6	24	Full		Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	7	132	Full	FbSx 1 - 2	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	988	8	146	Full	FbSx 3 - 4	Y	
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	14	32	Full		Y	93C.040
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	15	21	Full		Y	93C.040
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	16	32	Full		Y	93C.040
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	17	42	Full		Y	93C.040
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	18	26	Full		Y	93C.040
1996-048	Arcas	1996	Lignum Ltd.	A45026	990	19	17	Full		Y	93C.040
1996-048	Arcas	1996	Ministry of Forests	Bull Canyon S		WL	600	Partial	FaRu 31 - 33	N	
1996-048	Arcas	1996	Ministry of Forests	A46721		1	42.5	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51673		1	27.5	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51673		3	12.6	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		6	3.8	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		7	17.5	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		8	2.4	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		9	6	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		10	42.4	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		11	62	Full		Y	
1996-048	Arcas	1996	Ministry of Forests	A51683		Rd		Full	FbRu 4	N	
1996-048	Arcas	1996	Riverside F.P.	A20028	89Y	1	83.4	Partial		Y	
1996-048	Arcas	1996	Lignum Ltd.	A20028	92Y	2A	6.7	Full		Y	
1996-048	Arcas	1996	Lignum Ltd.	A20028	92Y	2B	2.8	Full		Y	
1996-048	Arcas	1996	Lignum Ltd.	A20028	92Y	2C	2.4	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	Tete	Rd		Full		N	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-048	Arcas	1996	Timberwest Forest	A20019	7Y	10	3	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	7Y	14A	51.5	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	8Y	1	10	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20025	13Y	8	9	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	14Y	1B	10	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	14Y	3	12	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	59Y	5	31.9	Partial		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	59Y	7	14.2	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	59Y	9	20.6	Partial		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	59Y	10	6.9	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	801	1	13.3	Full	FcRv 10	Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	2	34	Full	FcRv 11 - 13	Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	3	17.4	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	4	47.4	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	5	23.4	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	6	21.1	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	7	36.4	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	8	62.2	Full		Y	93B.033/044
1996-048	Arcas	1996	Timberwest Forest	A20019	801	Rd		Partial		N	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	1	51.2	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	2	37.9	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	3	58	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	4	47.1	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	5	23.8	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	6	38.6	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	7	17.6	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	970	Rd		Full	EjRv 1 - 2	N	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	1	46.6	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	2	19.3	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	3	20.2	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	4	32.1	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	5	58.4	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	6	53.7	Full		Y	
1996-048	Arcas	1996	Timberwest Forest	A20019	972	7	19.4	Full		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-048	Arcas	1996	West Fraser Mills	A20020	745	1	48	Full		Y	
1996-048	Arcas	1996	West Fraser Mills	A20020	966	1	60	Full		Y	
1996-048	Arcas	1996	West Fraser Mills	A20020	966	2	87	Full		Y	
1996-048	Arcas	1996	West Fraser Mills	A20020	966	5	17	Full		Y	
1996-048	Arcas	1996	West Fraser Mills	A20020	967	1	40	Full		Y	
1996-048	Arcas	1996	West Fraser Mills	A20020	967	2	50	Full		Y	
1994-	Arcas	1996	Ministry of Forests	A50867			72.8	Full	FaRu 29 - 30	Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	9		Full		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	11		Full		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	1		Full		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	3		Full		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	4		Full		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	6		Partial		Y	
1994-075	IRWilson	1994	Weldwood Canada	A45024	946	13		Full		Y	
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	59	431		Full		Y	93C111
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	59	433		Full		Y	93C111
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	59	437		Full		Y	93C111
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	59	438		Full		Y	93C111
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	59	442		Full		Y	93C116
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	55	444		Full		Y	93C112/117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	55	446		Full		Y	93C112
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	55	447		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	454		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	55	455		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	55	456		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	457		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	458		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	475		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	480		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	481		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	482		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	483		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	484		Full		Y	93C117
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	51	485		Full		Y	93C117

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	11		Full		Y	93C107
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	8		Full		Y	93C107
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	6		Partial		Y	93C107
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	4		Full		Y	93C107
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	5		Full		Y	93C107
1996-034	Norcan	1996	Yun Ka Whu'ten	A47409	26	1		Full		Y	93C107
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	21	9.9	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	22	9.6	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	23	11.8	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	24	2	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	96	8.5	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	97	5.3	Full	FaRr 4 - 5	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	826	Rd		Full	FaRr 3, FaRs	N	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	55	24.6	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	56	33.2	Partial	FaRs 5	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	66	24	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	68	17	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	70	33.2	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	71	49	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	234	28.4	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	235	38.7	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	236	17.3	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	240	12.2	Partial		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	827	72	19.4	Full	FaRr 6 - 7,	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	227	24.8	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	228	59.6	Full	FaRs 10	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	251	26.1	Full	FaRs 11	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	252	11	Partial	FaRs 8	Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	262	19.9	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	265	31	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	268	25.7	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	828	Rd		Full	FaRs 7, FaRs	N	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	829	163	26.2	Partial		Y	93B102/103
1996-048	Arcas	1996	Lignum Ltd.	A20018	829	270	21.3	Full		Y	93B103

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-048	Arcas	1996	Lignum Ltd.	A20018	829	271	39.3	Full		Y	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	829	Rd		Partial	FaRt 18	N	93B103
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	173	35.5	Full		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	174	5.9	Partial		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	175	10.3	Partial		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	195	47.9	Partial		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	197	2.84	Partial		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	208	6.6	Full		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	214	8.4	Partial		Y	93B102
1996-048	Arcas	1996	Lignum Ltd.	A20018	831	217	25.4	Partial		Y	93B102/107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	338A		Partial		Y	93B108
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	373		Partial		Y	93B108
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	374		Partial		Y	93B108
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	328	16.7	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	329	10.2	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	333	22.5	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	334	32.7	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	335	21	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	337	33.2	Partial		Y	93B107/108
1996-048	Arcas	1996	Lignum Ltd.	A20018	832	338		Partial		Y	93B107/108
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	397	16.5	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	398	7.5	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	399	92.4	Full	FcRu 3	Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	401	13	Partial		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	403	38.5	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	405	58.5	Partial	FcRu 4	Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	407	11.5	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	408	5.5	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	409	11	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	448	36	Full	FbRu 3	Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	449	11	Full		Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	457	14.5	Full	FcRu 2	Y	93B107
1996-048	Arcas	1996	Lignum Ltd.	A20018	834	Rd		Partial	FbRu 2	N	93B107
1996-119	Antiquus	1996	Riverside F.P.	A20016	754	1	61.1	Partial		Y	93C114

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-119	Antiquus	1996	Riverside F.P.	A20016	754	5	34	Partial		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	765	4	39.2	Full		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	765	5	50.3	Full		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	765	7	14.2	Partial		N	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	766	1	38.2	Full		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	766	2	16.5	Partial		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	766	3	22.3	Partial	FcSe 1	Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	766	4	500	Partial	FcSd 1 - 5	Y	93C114
1996-196	Antiquus	1996	Riverside F.P.	A20016	767	1		Full	FeSd 1 - 2,	Y	93C119
1996-119	Antiquus	1996	Riverside F.P.	A20016	771	2	60.5	Full		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	771	8	57.8	Partial		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	771	10	45.8	Partial		Y	93C114
1996-119	Antiquus	1996	Riverside F.P.	A20016	771	11	25.2	Partial		Y	93C114
1996-048	Arcas	1996	Ministry of Forests	A51679		1	28.4	Full		Y	93B107
1996-148	Antiquus	1996	Ministry of Forests	A48114	1		59.5	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48114	3		52.4	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48115	1			Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48115	2		97.2	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48119	1		139.3	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48148		1	40.5	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48148		4	45.4	Field Recon		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48148		6	94.6	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48148		8	24.3	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48152		1	30.85	Field Recon		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48152		2	9.25	Field Recon		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48152		3	2.4	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48153		3	4.9	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48153		4	48.3	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48154		2	15.7	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48154		3	3.4	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48154		4	17.2	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48154		Rd		Partial		N	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48155		2	43	Full		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48155		3	36.8	Partial		Y	93C103

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-148	Antiquus	1996	Ministry of Forests	A48155		4	17.7	Partial		Y	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48155		5	1.5	Field Recon		Y	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48155		6	3	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48155		7	6.3	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A48155		Rd		Partial		N	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48156		5	75.3	Partial		Y	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48156		Rd		Partial		N	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48664		2	33.6	Partial		Y	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48664		4	4.4	Partial		Y	92N123
1996-148	Antiquus	1996	Ministry of Forests	A48664		Rd		Partial		N	92N123
1996-148	Antiquus	1996	Ministry of Forests	A51609		1	40.5	Partial		Y	93C105
1996-048	Arcas	1996	Ministry of Forests	A51677		1	33.5	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51677		2	27.2	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51677		5	29.9	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51677		6	6.9	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51677		7	6	Partial		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51678		3	75	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51678		Rd		Full		N	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		1	23.4	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		3	29.9	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		5	61	Partial		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		6	14.6	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		2	18.2	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		4	35.7	Partial	FbRt 1	Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51680		7	35	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51682		3	45.7	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51683		1	4.6	Partial		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51683		2	13.6	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51683		4	62.6	Full		Y	93B107
1996-048	Arcas	1996	Ministry of Forests	A51683		5	10.4	Partial		Y	93B107
1996-148	Antiquus	1996	Ministry of Forests	A51982		1	8.3	Field Recon		Y	92N125
1996-148	Antiquus	1996	Ministry of Forests	A51982		3	2.8	Field Recon		Y	92N125
1996-148	Antiquus	1996	Ministry of Forests	A51983		1	47.9	Partial		Y	92N125
1996-148	Antiquus	1996	Ministry of Forests	A51983		2	17.9	Partial		Y	92N125

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-148	Antiquus	1996	Ministry of Forests	A51983		Rd		Partial		N	92N125
1996-148	Antiquus	1996	Ministry of Forests	A51984		1	7.1	Partial		Y	92N125
1996-148	Antiquus	1996	Ministry of Forests	A51984		6	6.1	Partial		Y	92N124
1996-148	Antiquus	1996	Ministry of Forests	A54073		311C	91.1	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A54073		311D	21.5	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A54072		317D	20	Partial		Y	93C103
1996-148	Antiquus	1996	Ministry of Forests	A54072		Rd		Partial		N	93C103
1996-148	Antiquus	1996	Ministry of Forests	A54075		336	23	Partial		Y	93C107
1996-148	Antiquus	1996	Ministry of Forests	A54075		337	74.3	Partial		Y	93C107
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	104	2	3.2	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	105	2		Partial		Y	93C104/109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	105	9		Full		Y	93C104
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	1	15	Partial		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	2	15	Full		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	3	15	Full		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	4	15	Full		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	6	15	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	7	15	Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	8	15	Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	13	15	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	109	Rd		Partial		N	93C109/114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	1		Full		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	2		Full	FcSd 8	Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	4		Full	FcSd 9	Y	93C109/114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	6		Partial		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	9		Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	10		Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	11		Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	12		Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	16		Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	17		Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	110	Rd		Partial		N	93C114
1996-048	Arcas	1996	Timberwest Forests	A20019	42Y	1	11.8	Full		Y	93B112
1996-048	Arcas	1996	Timberwest Forests	A20019	42Y	3	54.1	Partial		Y	93B112

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-048	Arcas	1996	Timberwest Forests	A20019	42Y	4	33	Full		Y	93B112
1996-048	Arcas	1996	Timberwest Forests	A20019	42Y	7	19.5	Partial		Y	93B112
1996-048	Arcas	1996	Timberwest Forests	A20019	42Y	10	13.3	Partial		Y	93B112
1996-048	Arcas	1996	Timberwest Forests	A20019	753	10	57.8	Partial		Y	93B101
1996-048	Arcas	1996	Timberwest Forests	A20019	753	12	29.1	Full		Y	93B101
1996-048	Arcas	1996	Timberwest Forests	A20019	753	14	24.4	Partial		Y	93B101/102
1996-048	Arcas	1996	Timberwest Forests	A20019	753	15	59.2	Full		Y	93B102
1996-048	Arcas	1996	Timberwest Forests	A20019	753	16	8.7	Full	FaRv 13	Y	93B102
1996-048	Arcas	1996	Timberwest Forests	A20019	753	17	18	Full		Y	93B102
1996-048	Arcas	1996	Timberwest Forests	A20019	753	13	53.2	Full		Y	93B101
1996-148	Antiquus	1996	Ministry of Forests	A54074	39	304	25.8	Partial		Y	93C103
1996-034	Norcan	1996	Yun Ka Wu'ten	A47409	39	305		Full		Y	93C103/108
1996-034	Norcan	1996	Yun Ka Wu'ten	A47409	39	351		Full		Y	93C108
1996-034	Norcan	1996	Yun Ka Wu'ten	A47409	39	357		Full		Y	93C108
1996-034	Norcan	1996	Yun Ka Wu'ten	A47409	39	304D		Full		Y	93C108
1996-034	Norcan	1996	Yun Ka Wu'ten	A47409	39	304E		Full		Y	93C103/108
1996-048	Arcas	1996	Timberwest Forests	A20019	37Y	1	25.2	Full		Y	93B103/108
1996-048	Arcas	1996	Timberwest Forests	A20019	37Y	2	50.2	Full	FbRs 2 - 3	Y	93B103/108
1996-048	Arcas	1996	Timberwest Forests	A20019	37Y	3	19.2	Full	FbRs 1	Y	93B108
1996-048	Arcas	1996	Timberwest Forests	A20019	37Y	4	16	Full		Y	93B103
1996-048	Arcas	1996	Timberwest Forests	A20019	37Y	5	19	Full		Y	93B103
1996-196	Antiquus	1996	Riverside F.P.	A20019	91Y	5	10.8	Full		N	93B107
1996-048	Arcas	1996	Timberwest Forests	A20019	57Y	1	13	Full		Y	93B107
1996-048	Arcas	1996	Timberwest Forests	A20019	57Y	4	40	Full	FcRu 1	Y	93B107
1996-048	Arcas	1996	Timberwest Forests	A20019	57Y	5	16.3	Full		Y	93B107
1996-048	Arcas	1996	Timberwest Forests	A20019	57Y	6	28.8	Full		Y	93B107
1996-196	Antiquus	1996	Riverside F.P.	A20019	88Y	1	37.6	Full		Y	93B107
1996-196	Antiquus	1996	Riverside F.P.	A20019	88Y	2	6.5	Full		Y	93B107
1996-196	Antiquus	1996	Riverside F.P.	A20019	88Y	3	16	Full		N	93B107
1996-196	Antiquus	1996	Riverside F.P.	A20019	84Y	2	24.4	Full		N	93B108
1996-048	Arcas	1996	Timberwest Forests	A20019	94Y	3		Full		Y	93B112
1996-196	Antiquus	1996	Riverside F.P.	A20016	772	6		Partial		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	112	5	27.5	Full		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	112	7	27.5	Full		Y	93C114

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-119	Antiquus	1996	Riverside F.P.	A20016	01Y	1		Full		Y	93C119
1996-119	Antiquus	1996	Riverside F.P.	A20016	03Y	3		Full		Y	93C119
1996-119	Antiquus	1996	Riverside F.P.	A20016	987	1		Full	FeSc 1	Y	93C119/12
1996-196	Antiquus	1996	Riverside F.P.	A20016	04Y	2	8	Full		Y	93C120
1996-196	Antiquus	1996	Riverside F.P.	A20016	04Y	3	5	Full		Y	93C120
1996-048	Arcas	1996	Riverside F.P.	A20028	704	8	2	Full		Y	93B107
1996-048	Arcas	1996	Riverside F.P.	A20028	94Y	2	1.5	Full		Y	93B107
1996-048	Arcas	1996	Riverside F.P.	A20028	94Y	3	12	Full		Y	93B107
1996-048	Arcas	1996	Riverside F.P.	A20028	95Y	3	5	Full		Y	93B107
1996-048	Arcas	1996	Riverside F.P.	A20028	99Y	1	1.5	Full		Y	93B102
1996-196	Antiquus	1996	Riverside F.P.	A20016	764	4		Full		Y	93C115
1996-196	Antiquus	1996	Riverside F.P.	A20016	764	2		Full		Y	93C115
1996-196	Antiquus	1996	Riverside F.P.	A20016	741	1		Full		Y	93C115
1996-196	Antiquus	1996	Riverside F.P.	A20016	741	1A	24.8	Full		N	93C115
1996-196	Antiquus	1996	Riverside F.P.	A20016	768	5		Full	FeSc 2	Y	93C119
1996-196	Antiquus	1996	Riverside F.P.	A20016	768	6		Partial		Y	93C119
1996-196	Antiquus	1996	Riverside F.P.	A20016	763	1		Full		Y	93C119
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	112	1	27.5	Partial		Y	93C114
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	112	3	27.5	Full		Y	93C114
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	497	28.7	Full		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	502	42.3	Partial		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	503	21.3	Partial		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	505	46.7	Full		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	5069	59	Partial		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	507	20.5	Partial		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	508	27	Partial		Y	93C117
1996-243	Middleton	1996	WestChilcotin F.P.	A47409	66	509	27.9	Partial		Y	93C117
1996-148	Antiquus	1996	Ministry of Forests	A48147	6		31.5	Partial		N	93C103
1996-196	Antiquus	1996	Riverside F.P.	A20016	768	1		Full		Y	93C120
1996-196	Antiquus	1996	Riverside F.P.	A20016	768	3		Full		Y	93C120
1996-243	Middleton	1996	West Chilcotin F.P.	A47409	63	Rd		Partial		N	93C112
1996-196	Antiquus	1996	Riverside F.P.	A20016	740	1	22.4	Full	FdSa 1- 3	Y	93C120
1996-196	Antiquus	1996	Riverside F.P.	A20016	740	2	21.9	Full		Y	93C120
1996-196	Antiquus	1996	Riverside F.P.	A20016	740	3	12.6	Full		Y	93C120

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1996-196	Antiquus	1996	Riverside F.P.	A20016	740	4	7.9	Full		Y	93C120
1996-148	Antiquus	1996	Ministry of Forests	A54073		Rd		Partial		N	93C103
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	2	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	8	13.5	Partial		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	10A	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	10B	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	10C	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	10D	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	14	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	15	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	16	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	16A	13.5	Full		Y	93C109
1996-117	Antiquus	1996	Tsi Del Del Enter.	A49778	963	Rd		Partial		N	93C109
1996-119	Antiquus	1996	Riverside F.P.	A20016	964	2	9.3	Full		Y	93C104
1996-119	Antiquus	1996	Riverside F.P.	A20016	964	3	7.8	Full		Y	93C104
1996-119	Antiquus	1996	Riverside F.P.	A45072	900	2	50.9	Full		N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	900	3	76.4	Full	FbSb 3	N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	900	5	24.4	Full		N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	900	10	13.8	Field Recon		N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	2	8.8	Partial		Y	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	6	7.5	Partial		N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	7	38.9	Full	FbSb 9	N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	8	10	Full	FbSb 5 - 8	N	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	11	4.3	Partial		Y	93C110
1996-119	Antiquus	1996	Riverside F.P.	A45072	959	Rd		Partial	FbSb 4	N	93C110
1996-260	Millennia	1996	Ministry of Forests	Lessard		WL	600	Partial	FeSi 2 - 3		
1996-260	Millennia	1996	Ministry of Forests	Hump Creek		WL	600	Field	FeSi 4		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	2	108.6	Full	EIRx 2		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	3	272.2	Full	EIRx 7		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	4	2.6	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	5	32.9	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	6	188.1	Full	EIRx 5		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	7	5.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	51Y	8	9.4	Full			

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	1	45.9	Full	FaRx 7		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	2	13.7	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	3	57.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	4	44.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	5	9.7	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	6	131.2	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	7	65.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	8	88	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	9	8.1	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	10	25	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	11	84.1	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	12	34.1	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	13	179.6	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	56Y	14	9.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	1	561.8	Full	EIRx 3		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	2	36.9	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	3	86	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	4	3.9	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	5	4.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	6	20.7	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	7	5.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	8	36.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	9	44.7	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	10	5.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	12	20.5	Full	EIRx 6		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	13	215.5	Full	EIRx 1		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	14	63.9	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	15	35.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	18	42.6	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	19	195.1	Full	EIRx 4		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	20	6.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	21	220.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	22	8.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	58Y	23	10	Full			

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	4	3.2	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	5	16.7	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	6	74.6	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	6A	1.3	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	9	12.8	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	12	79.8	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	13	7.9	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	15	39.1	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	16	22.2	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	17	37.4	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	17A	22.9	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	20	38.3	Full	FaSc 4	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	22	138.2	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	23	55.8	Full	FaSc 3	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	24	46.2	Full	FaSc 5 - 6	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	25	87.8	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	25A	23.9	Full	FaSc 7 - 10	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	26	78.4	Full	FaSc 11 - 12	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	27	38.4	Full	FaSc 13 - 14	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	28	39.8	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	29	75.9	Full	FaSc 15	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	29A	43.1	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	30	35.4	Full		N	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	31	51.4	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	32A	31.8	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	32C	73.9	Full		N	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	32D	74.9	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	33	59.4	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	981	34	37.1	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	1	146	Full	FaSb 3 - 4,	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	2A	384	Full	FaSb 2, FaSb	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	2B	104	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	2C	158	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	2D	46	Full		Y	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	68Y	1	180.7	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	68Y	2	110	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	68Y	3	25.1	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	68Y	4	72.8	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	68Y	5	3.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	1	48.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	2	62.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	3	18.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	4	35.2	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	5	17.6	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	6	40.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	7	148.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	8	50	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	9	56.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	10	291.2	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	11	150.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	12	52.8	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	13	150.2	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	14	31.6	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	15	70.2	Full	FaRw 11		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	16	13.2	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	17	18.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	70Y	18	32.8	Full	FaRw 9 - 10		
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	1	37.1	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	2	30.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	3	27.4	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	4	13.9	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	5	21.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	6	24.3	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	87Y	7	30.5	Full			
1995-224	Antiquus	1995-96	Timberwest Forest	A20019	998	1	57.6	Full			
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	1	15.7	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	2	9	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	980	3	75.8	Full		N	

Permit	Firm	Year	Proponent	FL/TSL	CP	BLK/RD	HA	AIA	Sites	Map	TRIM
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	982	5	79	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	983	1	86.4	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	983	2	49.3	Full	FaRw 12	Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	983	3	41.4	Full		Y	
1995-270	Antiquus	1995-96	Weldwood Canada	A45024	983	4	166.5	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	738	1	22.2	Full		Y	
1995-073	Arcas	1995	West Fraser Mills	A20020	738	2	41.1	Full		Y	

compilation of this information. A list of potential informants (Elders and other community members) who may have information about unrecorded archaeological sites and trails was compiled. The list was to include: (1) the names of possible informants, (2) their community or area of residence, and (3) the general location and types of sites known. A form for recording this information was provided by Arcas.

Interviews

On the basis of the initial community research, the researcher arranged and conducted interviews with community members to collect archaeological site and trail information. The researcher recorded information from community members about archaeological sites and trails located in the CFD (including areas designated as parks or protected areas) such as locations included burial places, trails, pithouses, cache pits, wagon roads, and battle sites. Forms were provided by Arcas to record the information collected in interviews. Wherever possible, the information to be collected by the researcher included the following:

- the name of the informant(s) interviewed
- the community or residence of the informant(s)
- the general location of the site/trail
- the identifying number of the site/trail and the map sheet it is plotted on
- the name (if known) of the site/trail or locality
- the types of archaeological site/trail
- a description of the site/trail, including the types of archaeological (physical) evidence at the site/trail
- what the site was used for
- when the site/trail was used, and by whom (if known)
- any other information obtained about the site

Wherever possible, the location of reported sites and trails was to be plotted on maps supplied to the researcher(s) to the greatest accuracy possible given the information obtained. Each site and trail was given an identifying number. NTS maps at a scale of 1:250,000 were provided to the researcher, and 1:20,000-scale TRIM maps were also made available.

Arcas recognized that certain sites or site types may be considered culturally sensitive by the Tsilhqot'in Nation for spiritual or religious reasons. In certain cases, the TNG may consider it to be appropriate to withhold information about these sites, including their locations, names, and uses. As such, Arcas agreed that, at the request of the TNG, that the locations of specific sites or site types would not be included on maps, and information about these sites would not be included in databases or reports. However, at the discretion of the TNG, the general site locations were to be mapped as areas of archaeological concern.

Ground-truthing

Using the information collected in the community interviews, the researcher selected areas for ground-truthing. Accompanied by an archaeologist from Arcas, and, where possible, the community member who reported the site, the researcher conducted a surface inspection of the reported site location. Ground-truthing was not conducted under a Heritage Inspection Permit, and therefore no subsurface testing was undertaken. All archaeological sites identified in this inspection were

APPENDIX D: Community-based Archaeological Research

Introduction

The purpose of this component of the research was to collect information from members of the Tsilhqot'in Nation regarding the location of trails and archaeological sites in the Chilcotin Forest District which would be useful for the Archaeological Overview Assessment (AOA). The specific goal of the community-based research component of the Chilcotin Forest District Archaeological Overview Assessment was to identify aboriginal trails, burial sites, spiritual sites, and other archaeological sites and indicators of archaeological potential that may not have been previously documented. This information was intended to ensure that Arcas incorporated all site types and site/trail locations known to the Tsilhqot'in Nation into the building of the archaeological site potential model for the AOA.

This research consisted of three tasks: (1) compilation of a list of community members with possible information about archaeological sites and trails, (2) interviews with selected community members, and (3) ground-truthing of reported site locations. A member of the Tsilhqot'in Nation (Stan Stump Sr.) was selected as the researcher for this project by the TNG, and subsequently hired by Arcas. Initial community research, interviews with Elders and other members of the Tsilhqot'in Nation, and the selection of areas for ground-truthing were primarily the responsibility of the researcher. The individuals interviewed were at the discretion of the researcher and the TNG. Ground-truthing of sites was conducted by the researcher accompanied by an archaeologist from Arcas and, wherever possible, the Elder or community member who reported the site(s). Overall research coordination and site recording were primarily the responsibility of Arcas.

This research was undertaken according to the Terms of the Working Relationship signed by representatives of Arcas and the TNG (see Appendix A). All information produced as a result of this research is without prejudice to, will not abrogate from, and does not constitute a waiver of the aboriginal rights and title held by the Tsilhqot'in Nation and its member communities to the land, archaeological sites and archaeological artifacts within their territories. Source materials provided by or developed by members of the Tsilhqot'in Nation, defined as oral or documented archaeological site/trail information, including videotapes, photographs, interview tapes, field notes, forms, and maps pertaining to these archaeological sites/trails, remain the property of the TNG and/or communities of the Tsilhqot'in Nation. All sites ground-truthed as part of the Community Research component were recorded to the standards required by the Archaeology Branch and placed in the Provincial Heritage Sites Register. Site forms and detailed maps were provided to the Archaeology Branch only, and will not be released to any other parties without the permission of the Archaeology Branch. Only ground-truthed site locations (in digital form) and site type information was used in this AOA.

Methodology

Community Research

The community researcher contacted various Tsilhqot'in communities and Tsilhqot'in people living in the Chilcotin Forest District (CFD), in order to enquire about community members who may have information about sites/trails. Where appropriate, Arcas personnel assisted with the

Table D1: Ground-truthing Results

General Location	Site #	Site Types(s)	Informant	Recorded by	Date Ground-truthed
E. Palmer Lake	97T1	lithic, cache	M. Elkins	ME, MK, SS	Aug. 26, 97
Elkins Meadow	97T2	cache	M. Elkins	ME, MK, SS	Aug. 26, 97
E. Palmer Lake	97T3	lithic	M. Elkins	MK, SS	Aug. 26, 97
E. Palmer Lake	97T4	lithic	M. Elkins	MK, SS	Aug. 26, 97
Tud Guntsen (Lake E of Chantslar Lake)	97T5	housepit, lithic	A. Guichon, E. Charleyboy	AG, MK, SS	Aug. 28, 97
Tud Guntsen	97T6	cache, burial	E. Charleyboy	AG, MK, SS	Aug. 28, 97
Tud Guntsen	97T7	housepit, cache	E. Charleyboy	AG, MK, SS	Aug. 28, 97
N. Punkutlaenkut Lake	97T8	lithic	E. Charleyboy	MK, SS	Sept. 3, 97
N. Punkutlaenkut Lake	97T9	housepit, cache, lithic	E. Williams	MK, SS	Sept. 3, 97
S. Alexis Lakes	97T10	lithic, burial	L. Stump	MK, SS	Oct. 2, 97
Redstone	97T11	lithic	R. Guichon	RG, MK	Oct. 23, 97
Chilko River	97T12	housepit, cache	E. Charleyboy	RC, AR, SS	Oct. 24, 97

Evaluation

The results of the community research were less extensive than anticipated. In the end, less than half of the time and funds originally allocated for this component were expended. As a result, fewer individuals were interviewed, and fewer reported site locations were ground-truthed. The limited success of this component of the research can be partially attributed to problems in communication between Arcas and the community researcher, difficulties in logistical arrangements and coordination of schedules, and the late date in the field season when research commenced. The community researcher was unable to continue with his duties at the start of 1998, and unsuccessful attempts were made to have the TNG coordinate the remainder of the research. Although a contractual agreement and information-sharing protocol were drafted in January of 1998, Arcas was unable to formalize this arrangement with the TNG before the project ended. In addition to communication, scheduling and logistical problems, it should be noted that the formalized approach proposed by Arcas for collecting interview information did not appear to work well in the context of the communities and did not appear to be an appropriate approach for the community researcher.

Despite the limited scope of the interview information collected, the community research component of the AOA has clearly demonstrated the value of this type of research. The results indicate that a large number of individuals in Tsih'ot'in communities have extensive knowledge about the locations and types of archaeological sites in the Chilcotin Forest District. Archaeological

mapped, photographed, and recorded on B.C. Site Inventory forms. Additional information supplied by informants was also recorded. The locations of sites and trails were plotted on 1:20,000-scale TRIM maps, except where such information was considered sensitive due to the nature of the site. The locations of sites were also digitized in a GIS for use in the AOA. The only site information attached to digitized sites was the site number (B.C. Site Inventory #) and the site type. Except where required to register sites with the Archaeology Branch, detailed site information, including access, was not to be released without the permission of the TNG

Results

Initial planning meetings were held on July 2, 1997 with the TNG, and Stan Stump Sr. was hired as researcher on July 3rd. Work on the project commenced on July 21, 1997. The community researcher and Arcas personnel, in consultation with Tsilhqot'in community members, Tsilhqot'in Nation Chiefs, and TNG representatives, identified a total of 35 potential informants (Elders and community members) with specific information about archaeological sites and trails. The community researcher conducted interviews with 17 of these informants, and recorded information including the locations of sites and site types. In some cases, the community researcher accompanied the informants to the reported site locations in order to conduct a brief reconnaissance of the area. The list of informants and interview information was to be provided to the TNG by the community researcher.

On the basis of the interviews and the initial reconnaissances, and in consultation with representatives of the TNG and Arcas, a number of priority locations for ground-truthing were identified. Over the course of two months, five separate locations were ground-truthed by the community researcher accompanied by Arcas personnel (Table D1). Additional community members accompanied the researcher on two of these occasions. An additional location (Redstone) was ground-truthed by Arcas personnel only (Michael Klassen), although the location had been previously shown to Arcas personnel by a community member. Additional priority locations were not ground-truthed due to a lack of time and personnel, and difficulties in logistical arrangements.

Twelve archaeological sites were identified and recorded at the six ground-truthing locations (Table D1). One of the sites (Temporary Inventory No. 97T12), which had been partially recorded previously as part of the Chilko River Archaeological Inventory (Arcas 1998a), had been originally identified as part of the AOA community research. Additional reported archaeological sites were observed near the Tud Gutsen locality at the east end of Chantslar Lake, at the east end of Punkutlaenkut Lake, and on the east shore of Alexis Lakes. However, these sites were not recorded due to a lack of time and personnel. The recorded sites include housepit villages, cache pits, and artifact scatters (Table D1). Two of the sites (Temporary Inventory Nos. 97T6 and 97T10) were reported by informants to be cremation sites, although physical evidence of this was not observed. All of the sites in Table D1 were mapped, photographed, and recorded on B.C. Site Inventory forms, and were subsequently submitted to the Archaeology Branch. Site locations were also digitized and used in the AOA modelling process. No requests for withholding site locations or information were made by the TNG.

APPENDIX E: Trail Research

Introduction

In addition to the community-based trail research, a comprehensive archival trail research program was undertaken by Archeo Research Ltd. and Arcas in order to identify the routes of: (1) aboriginal trails, (2) non-aboriginal trails in use prior to 1846, and (3) trails of historical significance. This research focussed on map, archival, and historical sources pre-dating 1945. Except where evidence to the contrary was found, all trails in existence in the 19th century were assumed to be of confirmed pre-1846 aboriginal origin. Many trails and wagon roads in existence before 1945 were assumed to follow the routes of pre-1846 trails, and are considered to be of unconfirmed but probable aboriginal origin. No trails of strictly non-aboriginal origin pre-dating 1846 were identified. A few of the identified trails and wagon roads were considered to be of non-aboriginal origin, but are of historical significance. The Chilcotin Forest District Trail Inventory summary is presented in Table E1 and provides the name, source, route confidence, and origin of the identified trails.

Methodology

The principal historical sources outlined in the Terms of Reference for the Ethnographic Review and Trails Research were reviewed and a broader list of potential sources was created from an overview of archival sources. The card catalogues at the British Columbia Archives and Record Service (BCARS) and the Culture Library, Ministry of Small Business, Tourism and Culture, were reviewed by searching on key geographical names and terms from the study area. In addition, pre-emption maps at the Surveyor General Branch and the historic trails file at the Archaeology Branch were reviewed. All information was divided into textual sources and map sources, and dealt with separately. The materials with trail information were divided into textual sources and map sources, and dealt with separately.

The maps were then listed with a copy of each map being made as a working copy for analysis and plotting. The working copies of the maps and all other information relating to the trail research have been kept on file at Archeo Research Ltd. should any further need for them arise. Initially, all trails on each map were marked for analysis. The extent of each trail was then determined, as networks of trails that connected to each other had to be judgementally separated from each in order to be classified for the study. The trail classifications were based on: (1) suggestions of a dominant trail route as opposed to fringe trails on the map itself, often indicated by different legend symbols (i.e., double wide line for definite trail, broken track line for indefinite trail, etc.), or (2) a logical estimation of the dominant route by reviewing the direction of its origin and destination. If no obvious features could distinguish connecting trails from each other, they were separated arbitrarily for the classification in the table.

Textual sources were examined to develop the information compiled from the maps. Most literary sources were unaccompanied by any maps, and references to trails or their routes were often vague at best. Consequently, most textual information provided little information on specific trail locations, and served generally to support information from the maps.

sites were identified during every attempt at ground-truthing of reported site locations, demonstrating that this knowledge is accurate and reliable.

The information obtained from the ground-truthing of reported sites was also useful. Although the locations of most sites were not unexpected, the types of sites found in several of these locations were unexpected or unusual. In particular, cache pits previously had been reported on islands, but archaeological site Temporary Inventory No. 97T6 appears to be the first such site recorded in the CFD. Also, the location of a major housepit village (Temporary Inventory No. 97T12) is at a much greater distance from the Chilko River than had been expected. Also, probable housepits recorded at Tud Guntsen and Punkutlaenkut Lake substantially expands the recorded distribution of this site type on the Chilcotin Plateau. New information on cremation sites was also obtained. Overall, the results of the ground-truthing aided in the review and testing the model, and helped determine the appropriateness of feature buffers.

Although limited in scope, the results of the community research suggest that this type of project has value. If at all possible, research of this nature should continue in the future, as the interviews and groundtruthing were extremely efficient and productive. Information about many reported sites and areas of concern was collected, and all of these areas should be ground-truthed. Moreover, much community knowledge about archaeological sites is still available, and it is important to record the knowledge of Elders. With improved organization, and the utilization of more appropriate information gathering techniques, future community research will be more successful.

ventured through the northern part of the Quesnel Forest District proposing various routes for the transcontinental railway.

Table E1: Key to Chilcotin Forest District Trail Inventory Table

Code	Description
Trail No.	Identification number
TRIM Map Sheet	Number(s) of TRIM Sheet(s) on which the trail appears
Trail Origin	1 - Confirmed Aboriginal Trail 2 - Unconfirmed, but probable Aboriginal Trail 3 - Non-Aboriginal Trail
Confidence	1 - High confidence of route (GREEN on map) 2 - Moderate confidence of route (PINK) 3 - Low confidence of route (YELLOW)
Trail Name	Name of Trail (if known)
General Route	Description of General Route of Trail
Comments	Comments: important facts about trail or its source, cross-references, known name(s) of First Nation peoples affiliated with the trail/area
Reference	Author/Source of Trail Information CLMV - Crown Lands Map Vault DLLPM - Dept. of Lands, Lillooet Pre-emptor's Map DLFGPM - Dept. of Lands, Fort George Pre-emptor's Map DLQPM - Dept. of Lands, Quesnel Pre-emptor's Map DLCPM - Dept. of Lands, Chilcotin Pre-emptor's Map MSBTC - Ministry of Small Business, Tourism, and Culture JET - Journal of the Exploration for a Trail BCOE - B.C. Outdoors Explorations BIR - The Bure Inlet Route PP - Packhorses to the Pacific POCPR - Preliminary Operations on the CPR up to January 1877
Source Map	Name/Location of Source Map CLMV - Crown Lands Map Vault BCARS - British Columbia Archives and Record Service NTS - National Topographic Series

Maps generated from such explorations indicated the existence of some trails, but most maps focussed on specific railroad routes rather than identifying trails. Pre-emption maps from 1921 to 1926 also indicated trails, but again, they were not the focus of the work. Accordingly, trail routes were often vaguely plotted and inconsistently recorded. As a result, the trails recorded from these sources are concentrated in certain areas and do not provide a complete picture of trails in the study area as a whole. The aboriginal origin of trails located in areas subject to long term Euro-Canadian settlement, such as Williams Lake, were difficult to ascertain. As such, these types of trails were not included in the study.

Identified trails were classified according to their origin into three classes: (1) **confirmed aboriginal** trails, (2) **unconfirmed aboriginal** trails, and (3) **non-aboriginal** trails. Whether non-aboriginal trails predate 1846 was largely undeterminable from the available sources, therefore all non-aboriginal trails on the historical maps were included in the non-aboriginal trail category.

The confidence level of trail routes were also classified into three levels: (1) **high** confidence of route - precise route of trail is known (i.e., which side of stream/lake/mountain is known, distance to features may be estimated), (2) **moderate** confidence of route - general route of trail is known (i.e., watercourse or valley known, but which side of stream/lake/mountain is unknown, distance to feature cannot be confidently estimated), (3) **low** confidence of route - only a vague route is known (i.e., trail went from Feature A to Feature B, but specific watercourse/valley or other feature is not known). Various segments of a single trail were classified at different levels of confidence when necessary. The level of confidence for a trail was determined from historical information. The visual representation of maps were naturally far more explicit in their route description and therefore trails often had high levels of confidence. Less detailed routes described in textual sources were classified with lower levels of route confidence.

To reflect levels of trail route confidence on the maps, a colour coding scheme was developed. This was applied first to the working maps, and once the information was finalized, it was transferred to the final map set for Arcas. **High** confidence segments of trails were marked in green highlighter, **moderate** confidence in pink, and **low** confidence trails were marked in yellow. As noted, a single trail could possess segments of various levels of confidence.

Rather than transfer the trail information onto a set of NTS 1:50,000 maps for the area, marked trails were then transferred from working copies of the historical maps to the new copies of archival maps that were delivered to Arcas. In some cases, different maps contained repeat information or depictions of trail locations. Each trail encountered was entered separately, even if it appeared more than once on the various archival maps. This maintained the integrity of each report of a trail. Repeat information was cross referenced to the other trail numbers identifying that trail. Upon receipt of the maps at Arcas, the trail routes were replotted on 1:20,000 TRIM mapsheets to provide more accurate routes. These trails were then digitized as a digital map coverage. Due to their relative accuracy, trails identified from 1:250,000-scale NTS maps were digitized directly from the original map, in order to minimize the plotting and digitizing required. Table E1 is the key to the **Chilcotin Forest District Trail Inventory Table** (Table E2).

Results

Historical sources describe approximately 100 trails in both the Quesnel and Chilcotin Forest Districts. Of these 100 trails, 35 are located within the CFD. The relative coverage for the CFD is uneven and sparse as most trail information is a product of explorations carried out at different times and for different purposes. The earliest accounts are from pioneers during the early 1860's when there was great interest in developing both road and rail access through the study area. Discovery of gold in the north instigated A.P. Waddington's campaign to build a road to access the Fraser River from Bute Inlet. Efforts concentrated along the Homathko River and through the Chilcotin Plateau in the southwest section of the Chilcotin Forest District. Canadian Pacific Railway (CPR) explorers

Recommendations For Further Research

The trail research extensively covered available sources of archival and historic information in British Columbia. These included plans and charts from the Surveyor General Branch, trail files at the Archaeology Branch, early historical accounts available at BCARS, and published historical sources. However, contemporary historical sources for the period before 1860 are not available in B.C. archives. The Hudson's Bay Company Archives in Winnipeg probably contain trail information for the period before 1860, and further research should attempt to explore the Hudson's Bay Company sources. Some other unexplored potential sources for post-1860 may be held by the Library of the Union of B.C. Indian Chiefs. Such potential sources may include ethnographic studies, traditional use studies and aboriginal cultural sustenance impact studies. Some traditional use studies have been conducted in the study area, but were not available to researchers. Historical studies have been conducted in the study area, but were not available to researchers. Historical and contemporary trail use could be investigated further by ground-truthing key areas within the forest districts. However, these procedures were beyond the scope of the project, but they might provide a more comprehensive understanding of trail use in the Quesnel and Chilcotin Forest Districts.

Table E2: Chilcotin Forest District Trail Inventory								
Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T028	93O.004, .005, .014, .015; 93J.094	2	1, 2, 3		W along Warner Creek bending N along Taseko River, extends NW of Denain Creek, forking out of study area into Williams Lake FD	See T085 for the westerly continuation of this trail	DLLPM 1924	CLMV 17T.2 Old Maps [107444]
T029	92O.004, 005	2	1, 2		From confluence of Taseko River and Denain Creek travels SE along Denain Creek to its juncture with Gun Creek		DLLPM 1924	CLMV 17T.2 Old Maps [107444]
T030	92N.026, .036	1	1, 2	H. McNoell's Track	Enters from the S along W side of Homathko River, follows river to its junction with Mosley Creek continues along Mosley Creek and off map	Marked on map as 'H. McNoels Track' See also T093	Waddington no date	CLMV 47T.1 Original Maps [107302]
T031	92N.037, .036	1	1	Tiedemann's Route	Along the N shore of E branch of Homathko River [after its juncture with Mosley Creek] to the foot of 'Mt. Success'	Marked on map as 'Tiedemans Route' See also T094, T113	Waddington no date	CLMV 47T.1 Original Maps [107302]
T039	93B.091, .081, .061, .031, .021, .012; 93C.070, .060, .050, .040	2; 3 S. of Chez-acut	1, 2, 3		Begins as a branch off T038 S of Coglistiko River, runs due S, crosses Baezaeko River, intersecting T040, further S, veers SW along Clusko River, S to Chezacut settlement, joins an undefined road, crosses T043 and follows along N bank of Chilcotin River, SW to confluence of Chilcotin and Chilanko Rivers		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T041	93C.060, .069, .070, .079, .080	2	2, 3		Begins near S end of Baezaeko River curves SE to head of Clusko River which it crosses in 2 places, ends on E shore of this river intersecting with T039.		DLCPM 1921	CLMV 13T.2 Old Maps [107440]

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T042	93B.014, .024, .034, .044, .054	1 ?	1, 2		From NW of West Road/ Nazko Rivers confluence, runs S along W side of the Nazko River, continues S to cross Redwater Creek, follows Nazko River until it branches SW-S past Tautri Lake to join Alexis Creek	N portion of this trail (indefinite road) deemed Origin:2 due to overlap of info from source of T006	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T043	93B.031, .032, .042, .043 93C.030, .040	2 ?	1, 2, 3		From W bank of Nastachi Lake, runs W along S bank of Temapho Lake, S of Clinchintampan River where trail likely continues as road past E bank of Chilcotin Lake, runs S past W bank of Puntzi Lake, ends at point on T047		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T044	93B.041, .051, .061,	2 ?	1, 3		From S branch of Clisbako River, runs due S, ending at Clinchintampan River W of Temapho Lake		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T045	93C.038, .039 .048, .057, .058	1	1	Indian Sleigh Road	Enters map from W, S of Chilcotin River, turns SE to join T046 near Knoll Creek	Marked 'to Itcha Mts - Indian Sleigh Road'	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T046	93C.029, .030, .038, .039	1	1	Indian Sleigh Road	Enters map from W, runs SE, crosses Knoll Creek, then forks E and S at Jorgenson Creek, E fork follows Jorgenson Creek to E end of Chilcotin Lake to T043; S fork runs S along N shore of Puntzi Creek To Puntzi Lake and T043.	Marked 'to Itcha Mts - Indian Sleigh Road'	DLCPM 1921	CLMV 13T.2 Old Maps [107440]

Table E2: Chilcotin Forest District Trail Inventory								
Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T047	92N.095, .098, .099; 93C.009, .010, .011 .020; 93B.002, .004, .005 .011, .012, .013, .014,	2 ?	1	telegraph trail	From W border of map, runs NW along S bank of Tatla Lake, follows Chilanko River, then Chilcotin River, W past Alexis Creek, further SW along Chilanko River past Hanceville and W out of study area	Although marked as a telegraph trail, it was likely an aboriginal trail in origin, linking up other trails in area	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T048	92N.048, .058, .059, .068, .069, .079, .080, .070	2	1, 3		Enters map at S end of Tatlayoko Lake, runs N to Choelquoit Lake, forks to loop around lake, rejoins at T049		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T049	92O.081, .091, .092, .095; 93B.002., .003, .004, .005, ; 92N.050, .059, .060, .070, .080, .090	2	1, 2		Begins E of Hanceville on Chilcotin River, follows S shore of river N/W, bends SW at confluence of Chilcotin/ Chilko Rivers, follows Chilko River SW past Choelquoit Lake, at Chilko Lake, trail forks S and SE; S fork follows W shore of Chilko Lake; SE fork runs S off map along W shore of Tsuniah Lake	See T083 as the S continuation of this trail	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T050	92N.100, 92O.091	2	1		From Bidwell Lakes E following Bidwell Creek to its confluence with Chilko River		DLCPM 1921	CLMV 13T.2 Old Maps [107440]

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T051	92N.060; 92O.051, .041	2 ?	1, 3		From N end of Tsuniah Lake, at T049 runs SE to Kenni (Konni) Lake and T052	See T082 for probable southern continuation of this trail	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T052	92O.041, .042, .052, .062	2 ?	1, 2, 3		From Kenni (Konni) Lake E, then N past I.R.3 and 4 to intersect with Taseko River		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T053	92O.052, .062, .072,	2	1, 3		From Nemiah Lake Road W of Taseko River, runs S along Taseko River off map		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T054	93B.003; 92O.063, .073 .083, .093	3	2, 3		Begins as 'Newton's Pack Trail' from N bank of Kloacut Lake, runs N-NW, identification changes to 'Newton's Wagon Road', runs N to intersect with T049, E of Chilcotin/ Chilanko Rivers confluence	Marked as 'Newton's Pack Trail' in S portion; N portion marked as 'Newton's Wagon Road'	DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T055	93B.004, .014, .015	2 ?	1, 2, 3		From Alexis Creek N past I.R.2 where it forks; W fork continues N past Anah Lake; E fork runs N crossing Anahim Creek in 2 places		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T056	93B.004, .014, .015, .016	2 ?	1, 3		From I.R.2 N of Alexis Creek, follows Anahim Creek E to Anahim Mt.		DLCPM 1921	CLMV 13T.2 Old Maps [107440]

Table E2: Chilcotin Forest District Trail Inventory								
Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T085	92O.004, .005, .013, .014, .015, .022, .023, .032 93J.094	2 ?	1, 2		Enters map from N follows Taseko River S to Taseko Lake, veers W-S past Lastman, Tuzcha and Fishem Lakes, then E bisecting Taseko Lakes, then SE; at Battlement Creek, trail forks: first from Battlement to Tyaughton Creeks [see T028]; second follows Denain Creek [see T029]; last fork follows along the Taseko River [see T028] out of study area	See T028 for the easterly continuation of this trail	Aitken 1923	CLMV 6T.2 Old Maps [107432]
T086	92O.041, .042	2 ?	2, 3		From Elkin Creek at intersection with T085 travels S, then E crossing the Taseko River then veers N off map		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T087	92O.013, .023, .024, .034	2 ?	3		From confluence of Taseko River and Powell Creek, follows Powell Creek E, then veers N to join an unnamed creek (possibly		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T088	92O.013, .014, .024	2 ?	3		From Battlement Creek [see T085] N along Nadila Creek, crossing W. Nadila Creek to Big Creek		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T090	92J.094;	2 ?	3		From Taseko River at 'Taylor Pass', runs S to Bridge River, veers E along Bridge River Before heading NE off map		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T091	92O.003, .013 92J.092, .093	2 ?	1, 2		From Taseko River SE of Powell Creek, trail runs SW-S to follow Lord River		Aitken 1923	CLMV 6T.2 Old Maps [107432]

Table E2: Chilcotin Forest District Trail Inventory								
Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T057	93B.023, .033	2	1, 2, 3		From E of Alexis Lake, runs N to Grudae Lake, heads E then N, then W looping back S past Nazko and 'Spair' Lakes		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T063	92O.075	2	1		From Hutch Lake, N of Fletcher Lake, heads E to I.R.2		DLCPM 1921	CLMV 13T.2 Old Maps [107440]
T080	92N.026, .036, .037, .038, .048, .049, .059, .069	2 ?	1, 2, 3		From Homathko River NE to Tatlayoko Lake, along eastern lake shore N off map; S end of same lake, a secondary trail veers E		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T081	92N.019, .029, .030	2 ?	1, 2		From W end of Franklin Arm on Chilko Lake, runs SW along Deschamps Creek, veering S-SW to follow Southgate River out of study area		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T082	92O.032, .041, .042	2 ?	1, 3		Enters map N of W end of Kenni (Konni) Lake, runs SE past N of Mt. Tatlow to N end of Tuzcha Lake	Probably the southern continuation of T051	Aitken 1923	CLMV 6T.2 Old Maps [107432]
T083	92N.041, .050, .060	2 ?	1, 2, 3		Enters map S end of Tsuniah Lake near Chilco Lake, runs SE, crosses Nemaia Creek, E to shore of Kenni (Konni) Lake	Southern continuation of T049	Aitken 1923	CLMV 6T.2 Old Maps [107432]
T084	92N.050; 92O.040, .041, .042	2 ?	1, 2, 3		From Chilko Lake, along N shore of Nemaia Creek E past Kenni (Konni) Lake, extends NE towards Taseko River		Aitken 1923	CLMV 6T.2 Old Maps [107432]

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T100	93C.009, .010, .020, .030 92N.036, .037, .045, .046, .047, .048, .049, .055, .059, .065, .066, .069, .076, .077, .087, .088, .089, .097, .098, .099	1	1, 2, 3		From SW corner of map near 'Mt. Reliance' (Mt. Queen Best), runs N past Homathko River, N to Puntzi Lake, where it loops S past Tatla Lake to join with its beginning at Mt. Reliance		Waddington 1863	CLMV 12T.3 Old Maps [106782]
T101	93B.013, .023, .030, .033, .041, .042 93C.050 92N.088, 098	1	3		From S end of Tatla Lake, runs NE to 'fishery' where it heads E to 'old fort' near 'Chilcoaten' River; at 'old fort' trail veers northeast to Alexis Lake At Alexis Lake, veers northwest past 'Atolsomi' to 'Chisco' River		Waddington 1863	CLMV 12T.3 Old Maps [106782]
T102	93B.031, .041; 93C.030, .040	1	1, 3		From 'Pincheen Village' at north end of Puntzi Lake, trail heads northeast to 'Atolsomi'		Waddington 1863	CLMV 12T.3 Old Maps [106782]
T103	N/A	1			From 'Pincheen Village' at Puntzi Lake, route travels east passing the north shore of Alexis Lake and the north shore of 'Saunders' Lake (near hut) and continues E crossing Narcosli R to Alexandria.	Not plotted due to insufficient information; See also T108, T114	Waddington 1863	CLMV 12T.3 Old Maps [106782]

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T092	92O.021, .022	2 ?	1		From N shore of Yohetta Lake, runs along Yohetta Creek E to T085 at Fishem Lake		Aitken 1923	CLMV 6T.2 Old Maps [107432]
T093	92N.026, .036, .045, .046, .055	1	1, 2	H. McNoell Track	From S along Homathko River, to its confluence with Mosley Creek, trail veers NW along Mosley Creek	See also T030 Marked as 'H. McNoell's Track'	Waddington 31 Jan. 1863	CLMV 12T.3 Old Maps [106781]
T094	92N.036, .037	1	1	Tiedemann's Route	From near 'Mt. Success' along Homathko River, SW to its confluence with Mosley Creek, veers W to Tiedemann's Glacier	See also T031, T113 Marked as 'Tiedeman's Route'	Waddington 31 Jan. 1863	CLMV 12T.3 Old Maps [106781]
T095	92N.026, .036	1	1, 2, 3		Begins at sharp meander of Homathko River S of its confluence with Mosley Creek; trail runs N forking NE and NW to connect with unnamed creek (to Tiedemann's Glacier) where Tiedemann's Route and H. McNoell's Track overlap		Waddington 31 Jan. 1863	CLMV 12T.3 Old Maps [106781]
T098	N/A			'Old Trail'	Enters map from W and travels E past Alexis Lake	not plotted due to insufficient information; see T134	Waddington 1863	CLMV 12T.3 Old Maps [106782]
T099	N/A			'Arm Trail'	Begins at 'Summit or Dead or ... Lake', runs SE to 'Manning Ranch' at N end of Puntzi Lake	not plotted due to insufficient information; see T134	Waddington 1863	CLMV 12T.3 Old Maps [106782]

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T113	92N.026, .036, .037, .038, .047, .048	1		Tiedemann's Route	Tiedemann's Route up the Homathko River to Tatlayoko Lake	See also T031, T094 (not plotted due to low confidence) Map details segments of this route which are probably aboriginal in origin	Tiedemann 1862	JET, BCARS, E/B/T44A, 1862
T114	N/A				Tiedemann's journey from Tatlayoko Lake N-NE to Puntzi Lake, continues E-NE to Ft. 'Alexandria'	See also T103 Trail too vague (not plotted)	Tiedemann 1862	JET, BCARS, E/B/T44A, 1862
T115	N/A				p.121: From N shore of Eliguck Lake NW to foot of small lake, W to 'Salmon River Valley' at the head of which lies Lake 'Nacoontloon,'in view of Lake 'N'ghaco'	No map included of this trail, only textual (not plotted) description from Fleming's survey of 1874	Fleming 1877	POCPR, BCARS, NW 971B/F59 8 1877
T117	92N.099, .098, .088, .078, .068	1			p.163: From Eagle Lake, along E side of valley S past Cochin Lake to the E side of Tatlayoco Lake	Textual reference only(not plotted but same as T100), but could be plotted roughly from Fleming's survey of 1875	Fleming 1877	PP, BCARS, NW 971B/F59 8 1877

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T104	93B.002, .003, .011, .012; 93C.020, .030	1	1, 2		From S end of Puntzi Lake trail travels south then east to joint the 'Chilcoaten' River by the 'Old Fort'		Waddington 1863	CLMV 12T.3 Old Maps [106782]
T110	92O.041, .042	1, 3	1, 2		From I.R. on W tip of Konni Lake S-SE along 'Tsoloss Ridge', connects with a non aboriginal 'jeep trail', veers N to join Nemaia Valley Rd. on E side of Konni Lake	Author Bob Harris describes W end of trail as aboriginal, E end of trail as non-aboriginal 'jeep trail'	Harris Oct. 1975	BCOE Oct. 1975: 22-23
T111	92O.011, .012, .021, .022	2, 3 ?	1, 2		From S tip of Fishem Lake S-SW along N shore of Tchaikazan River, W to 'Spectrum Pass', N to 'RCAF' Creek, W to Dorothy Lake, N-NE along N shore of Yohetta Lake and Creek, loops S to rejoin trail at Fishem Lake	Reference to indian trails in area is certain though they are not clearly distinguished from the non-aboriginal trails	Harris June 1984	BCOE June 1984: E4-E5, E16
T112	92N.048,	1	3		Incompleted mapping of trail shows it running E/W at the S end of 'Big' (Tatlayoko) Lake, crossing over to both sides of the Homathko River		Tiedemann 1862	JET, BCARS, E/B/T44A, 1862

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T127	92N.041, .050, .060		1		Starts at Konni L. then W to Nemaih Creek approx. 1.5 km E of Chilko L., N along Chilko L.		Edition 1 NTS	Edition 1 NTS
T128	92N.049, .059, .069, .070	1	2, 3		SW from Chilko River along Lingfield Creek to Potato Mountain, S to Chesi Pass, 1 spur N. to Chilko L., 2nd spur S looping N to T080		Chilcotin Elders	
T129	92N.069		1		Begins at Chelqueot L., S to Lingfield Creek		Edition 1 NTS	Edition 1 NTS
T130	92N.078, .079		1		Begins at Skinner Creek, E to E end of Chelqueot L.		Edition 1 NTS	Edition 1 NTS
T131	92N.051, .061, .062		1		Begins at Konni L., N along Elkin Creek approx. 7 km before confluence with Taseko River		Edition 1 NTS	Edition 1 NTS
T132	92N.013, .014, .023		3		Begins at confluence of Chilko River and Alexis Creek, N along Alexis Creek to Alexis L.		Edition 1 NTS	Edition 1 NTS
T133	92N.088, .098	1	1, 3		Tlatla to Eagle L. via Polywog L.			

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T118	92N.026, .036, .045, .046, .055	1, 3	1, 2		Middle Lake to Rasmussen Creek: from N end of Twist Lake S through valley on W side of Mosley Creek, cross Tiedemann Glacier to join T030	See text in Kershaw & Spittle 1978 pgs. 27-31	Kershaw and Spittle 1978	BIR, MSBTC Library, 971.1/K41
T119	92N.026	3	1		'Waddington's Canyon' to Rasmussen Creek: see text	See text in Kershaw & Spittle 1978 pgs. 22-27; See also T030	Kershaw and Spittle 1978	BIR, MSBTC Library, 971.1/K41 1978
T120	92O.013, .023	?	1, 2		Lower Taseko L. (E shore) to Taseko River (N bank)		Edition 1 NTS	Edition 1 NTS
T121	92O.002, .003, .012, .013		1		Upper Taseko L. (S shore) S to Falls River (N bank), S on Falls River to unnamed Lakes		Edition 1 NTS	Edition 1 NTS
T122	92O .013		1		Starts at Tchaikan River S to Zero L. (W shore), S to Falls River (W bank), crosses to join T121		Edition 1 NTS	Edition 1 NTS
T123	92O .013		1		Starts on Taseko River at T085, S to unnamed L. E of Lord River		Edition 1 NTS	Edition 1 NTS
T124	92O .014, .015	2	1		Follows Battlement Creek from juncture with Taseko, through Iron Pass to Big Creek	Edition 1 NTS, mostly contiguous with T085/028	Edition 1 NTS	Edition 1 NTS
T125	92O.004, .014		1, 2		Starts at Battlement Creek (S bank), to Dendian Creek, to Warner Creek		Edition 1 NTS	Edition 1 NTS
T126	92O.023		1		Starts on W shore of Lower Taseko L., S the N along T085 along Taseko River		Edition 1 NTS	Edition 1 NTS

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T139b		1	2		Begins at I.R. #29, then NW to I.R. #30, then SW to large swampy area		Edition 1 NTS	Edition 1 NTS
T140a			2		Begins at Dean R. S of Anaham L., N to unnamed creek, then NE crossing Holte Cr., then NE Crossing Bryant Cr., then N roughly following Bryant Cr. to its end, then N along Pan Cr. system to confluence with Carnlick Cr., then N, overland to W shore of Tsilbeck L.		Edition 1 NTS	Edition 1 NTS
T140b			2		Begins at 140a on S branch of Holte Cr., E along N bank avoiding swamps to end of creek N of Puntutlaekut L.		Edition 1 NTS	Edition 1 NTS
T141			2	"Beef Trail"	Begins on the E bank of Dean R., crossing W at confluence with Beef Trail Cr., then S along N bank of Beef Trail Cr. to its end		Edition 1 NTS	Edition 1 NTS
T142a			2		Begins at the community of Ulkatcho on the Entiako R., S to Dean R, then S along Dean R. (E bank) to Lessard Cr., then S to and along E shore of Lessard L.		Edition 1 NTS	Edition 1 NTS
T142b		1	2		Begins at I.R. #11 on N bank of Dean R. , SE along Dean R. to T142a		Edition 1 NTS	Edition 1 NTS
T143a		1	2		Begins at N end of Vick L., N to Tete Angela Cr., then NE to McDermott Cr. NE to S. and E. shores of Tush L., then NE to Minton Cr., NE along N bank of Minton Cr. to I.R. #1		Edition 1 NTS	Edition 1 NTS
T143b			2		Begins on N bank of Tete Angela Cr., NW along N bank then N to Haines Cr. and Lakes, ends at T143a		Edition 1 NTS	Edition 1 NTS

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T134	93B.011, .021, .022, .023, .033, .024, .035, .045; 93C.016, .017, .018, .019, .025, .026, .029, .030, .032, .042, .043	1	1, 2, 3	Palmer Trail	Begins at Tautri L., W to Puntzi L., W to North Bentenick Arm		Hart et al. 1994; Palmer H. 1863; Kershaw and Spittle 1981; Harris 1979; Harris 1989; Swanell 1961	
T135	93C.030, .040		1		Begins on N shore of Puntzi L., then N to Chilcotin L.		Edition 1 NTS	Edition 1 NTS
T136	93C.019, .020, .029		1		Begins W of T046, SW to cross Palmer trail, then SE to T047	•	Edition 1 NTS	Edition 1 NTS
T137	93C.009, .010, .018, .019, .020; GSG Map 1289a		1		Begins at Chilanko Forks, W to the community of Towdystan		Edition 1 NTS	Edition 1 NTS
T138		1	2		I.R #21 N. to I.R. #35		Edition 1 NTS	Edition 1 NTS
T139a		1	2		Begins at Dean R. just S of Anahim L., SE crossing unnamed creek, S to and crossing Holtry Cr., then SE along N bank to large unnamed L., SE to Knoll Cr., then E along N bank, N to I.R #28, then N crossing Palmer Cr. to I.R. #31 then NW to I.R #32		Edition 1 NTS	Edition 1 NTS

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T143c			2		Begins on S shore of unnamed L., follows McDermott Cr. to Raglan L. then N to T143a		Edition 1 NTS	Edition 1 NTS
T143d		1	2		Begins in I.R. #3, NE to I.R. #4 at Minton Cr., then N to I.R. #1		Edition 1 NTS	Edition 1 NTS
T144		1	2		Begins at I.R. #1, SE to I.R. #2, S and along E shore of Fletcher L., S to comm. of Big Creek via Abrams and Rushes Lakes, SW along N bank of Big Cr. to Willan Cr., W along N bank of Willan Cr., crosses S then overland NW to rejoin Willan Cr. after Willan L., W on N bank of unnamed tributary of Willan Cr., then S overland to end		Edition 1 NTS	Edition 1 NTS
T145			2		Begins at T144, SE to Big Cr., W on S bank of Big Cr. crossing to N bank then ends at the community of Big Creek		Edition 1 NTS	Edition 1 NTS
T146	93C.047, .057		1, 2				Klassen 1996; Klassen 1997	Edition 1 NTS
T147	93C.042, .043	1	1		Begins on Hotnarko R. (N. bank) at T134, N. towards Hotnarko L. then E. to T148 at Hotnarko's N. bank		Harris 1979	
T148	93C.043, .044	1	1, 2		Begins on N bank of Hotnarko R., leaves Hotnarko, then W to E shore of Pelican L., then to W shore of Anaham L.		Harris 1979; Palmer 1863	
T149		?	1		Begins at Puntzi L. (S shore), S to E shore of Chelquoet L.		Spafford 1997	

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T159			2		Begins at Tautri L. at T042, NE to Ramsey Cr., then N to Baker Cr. at T060		Edition 1 NTS	Edition 1 NTS

Table E2: Chilcotin Forest District Trail Inventory

Trail No.	TRIM Map Sheet	Trail Origin	Confidence	Trail Name	General Route	Comments	Reference	Source Map
T150			2		Begins on N. bank of Dean R., S of Anaham L., N around the N shore of Anaham L., then W along unnamed Cr., crosses Cr. then SW to Hotnarko R.		Edition 1 NTS	Edition 1 NTS
T151		1	2		Begins at T150 E of Anaham L., then N to I.R. #10, S crossing Dean R. at I.R. #14, then S to T150 W of Anaham L.		Edition 1 NTS	Edition 1 NTS
T152			2		Begins W of Carnation L., S to Hwy 20, N of Chilcotin R. (above Redstone)		Edition 1 NTS	Edition 1 NTS
T153			2		Begins N of Chilcotin R. on W bank of unnamed Cr. (SE of Redstone), N to Bell Cr.		Edition 1 NTS	Edition 1 NTS
T154			2		Begins on N bank of Ross Cr., N to Clisbanko R.		Edition 1 NTS	Edition 1 NTS
T155			2		Begins N of Annah L., N to Avon Cr., loop circuit N and S of Avon Cr.		Edition 1 NTS	Edition 1 NTS
T156			2		Begins on N bank of South Anahim Cr. at T056, then NE to Tautri Cr.		Edition 1 NTS	Edition 1 NTS
T157		1	2		Begins at T156 (NE of I.R. #4), SE to I.R. #7 via I.R. #5, then S past W. shore of Raven L. to end		Edition 1 NTS	Edition 1 NTS
T158a		1	2		Begins at N bank of Anahim Cr., NE to N shore of Stum L., N to I.R. #16, then NW to T042 just S of I.R. #18		Edition 1 NTS	Edition 1 NTS
T158b			2		Spur deviates from T158a NW through lake/wetland area		Edition 1 NTS	Edition 1 NTS

Terrain is also rugged in the Cariboo Mountains with total relief extending from the Cariboo River at about 900 m elevation to summit elevations of about 2600 m (Mt. MacLeod, Mt. Matthew). The Cariboo Valley and numerous other small U-shaped valleys were the flow corridors of ice on the east side of the study area. The Cariboo Mountains are underlain by sedimentary and metamorphosed sedimentary rocks, primarily quartzite.

The main summits of the Anahim Volcanic Belt (Tsitsutl Pk., Far Mt., and Mt. Downton), in the west of the study area) attain elevations of approximately 2400 m. No other volcanic centres exist within the study area. The most recent volcanic activity occurred between 7200 and 7100 BP, with the eruption of Nazko cone, located 75 km west of Quesnel (Souther et al. 1987). The Anahim Ranges are documented obsidian source areas for prehistoric peoples (Nelson and Will 1976).

Biogeoclimatic Zones by Pierre Friele, Bauman Engineering

Eight biogeoclimatic zones are represented in the Chilcotin Forest District: Bunchgrass (BG), Coastal Western Hemlock (CWH), Interior Douglas Fir (IDF), Montane Spruce (MS), Sub-Boreal Pine Spruce (SBPS), Sub-Boreal Spruce (SBS), Englemann Spruce-Subalpine Fir (ESSF), Alpine Tundra (AT). The eight zones are described from lowest to highest in elevation.

Bunchgrass (BG)

The Bunchgrass zone (BG) is the driest and hottest biogeoclimatic zone in the province. This zone occupies a small portion of the Chilcotin Forest District, mostly in the lower elevations of the Fraser and Chilcotin River valleys from Farwell Canyon to Big Bar. The BG zone is characterised by warm, hot, and dry summers and relatively cold winters with relatively little snowfall. Mean annual temperature in this zone is approximately 8°C, with monthly precipitation ranging between 0 - 30 mm. The forest cover in this zone, which usually consists of ponderosa pine and Douglas fir, is relatively sparse. Bunchgrasses and shrubs are the co-dominant species in this zone.

The Coastal Western Hemlock zone (CWH)

The Coastal Western Hemlock zone (CWH) occupies a small portion of the Chilcotin Forest District along the Homathko and Mosley River valleys. Within the Homathko River valley, this zone extends from valley bottom to the Mountain Hemlock zone, but in the upper Mosley Valley, the CWH extends to the Engelmann Spruce-Subalpine Fir zone. The CWH zone has cool summers and mild winters. Mean annual temperature is approximately 8°C, with mean annual precipitation ranging between 1000 - 4400 mm. Western hemlock is the dominant species in this zone, but western red cedar also occurs frequently. Douglas fir is common in the drier subzones in the study area (i.e., in the CWHs). Non-forested wetlands are uncommon in the mountainous landscape of the CWH. Grasslands are generally uncommon in the CWH.

The Interior Douglas Fir zone (IDF)

The Interior Douglas Fir zone (IDF) occupies the main valleys in the Chilcotin Forest district, extending up the Chilcotin, Chilanko, Chilco, and Taseko Rivers to about 1450 m in elevation. Climate in the IDF is characterized by warm, dry summers and cool winters with mean annual temperatures ranging between 1.6-9.5°C, and mean annual precipitation between 270-1200 mm. Open-to-closed, mature forests of Douglas fir dominate this zone. In drier areas (such as in the

APPENDIX F: Biophysical Research

Introduction

An introduction to the biophysical research conducted in this AOA was provided in **GIS Modelling of Archaeological Potential: Chilcotin Forest District, 1998 Volume 1: Final Report**. This Appendix provides additional details on the following: (1) a brief introduction to the biophysical setting of the study area, (2) short descriptions of the bioegeoclimatic zones in the Chilcotin Forest District, and (3) a review of the biophysical sources consulted in this study.

Biophysical Setting by Pierre Friele, Bauman Engineering

Ecologically, this area (both the Quesnel and Chilcotin Forest Districts) is strongly influenced by a continental climate, with cool winters and warm summers, and dry to moist moisture regimes. The Coast Mountains create a strong rainshadow, which extends as far east as Hanceville on the edge of the Chilcotin Plateau. Rainfall increases gradually towards the east toward, the windward side of the Cariboo Mountains, and reaches its highest levels in the valleys which penetrate those mountains. Snowfall is quite heavy on the upper slopes of the Cariboo Mountains. Mean annual temperature gradually declines from the Southern Interior Douglas fir forests into the Central Interior Sub-Boreal forests, with the transition near Marguerite, halfway between Williams Lake and Quesnel. The topographic gradient from the valleys of the Fraser, Quesnel, and Chilcotin Rivers to the Cariboo and Coast Mountains also strongly influences temperature and precipitation regimes.

The study area occupies the eastern foothills of the Coast Mountains and the Interior Plateau (Holland 1976), between the latitudes of Lillooet and Prince George (Figure F1). The northwest part of the study area includes the Anahim volcanic belt (which includes the Rainbow, Ilgachuz, and Itcha Ranges), a chain of east/west oriented shield volcanoes, while the east is bounded by the Cariboo Mountains. The central portion of the area consists of the Fraser Plateau, a subdivision of the Interior Plateau.

The plateau surface, which is situated between 1200 m and 1500 m above sea-level, consists of a broad, northwest-trending trough. The plateau is deeply dissected by the Fraser River and its tributaries (the Blackwater, Chilcotin, Chilanko, Chilko, Taseko, Nazko, and Quesnel Rivers). Topography on the plateau has low to moderate relief, reflecting the gentle surface of the underlying horizontally-bedded flood basalts.

In the west, the relief increases abruptly at the edge of the Coast Mountains, along a line linking the north end of Chilko Lake to Charlotte Lake. Near Chilko Lake, Mt. Tatlow reaches 3000 m in elevation and extends approximately 1500 m above the valley floor. To the west, into the heart of the Coast Mountains, the terrain gets increasingly rugged and glaciated, with Mt. Queen Bess, the highest summit in the study area, reaching 3200 m in elevation. Large U-shaped valleys (e.g., the Chilko and Tatlayoko valleys) penetrate the Coast Mountains and were the western source for Cordilleran ice in the study area. The spine of the Coast Mountains consists of igneous rocks, but a variety of volcanic and sedimentary rocks predominating on the east flank of the range.

Engelmann spruce and subalpine fir are climax species. However, frequent wildfires have led to extensive areas being dominated by dense, early seral, lodgepole pine stands. Douglas fir is an important seral species in this zone. However, it is less common in the coldest subzone (MSxv), the subzone of the Chilcotin Plateau. Douglas fir is found only on warm, south-facing slopes in this area. Wetlands are generally less common in the mountainous topography occupied by the Montane Spruce zone. Grasslands are uncommon, occurring only on south-facing xeric sites.

The Engelmann Spruce-Subalpine Fir zone (ESSF)

The Engelmann Spruce-Subalpine Fir zone (ESSF) is the highest of the forested zones, existing in mountainous areas and in dissected uplands. The climate is cold, moist and snowy, with mean annual temperatures ranging between -2 and 2°C and mean annual precipitation between 400-2200 mm. The ESSF zone occurs above the Interior Cedar Hemlock, Montane Spruce, and Sub-Boreal Spruce zones and below the Alpine Tundra zone. The lower parts of the zone, at about 1200 m elevation, are characterized by closed forests. These closed forests open up to parkland forest at higher elevations (approximately 2100 m asl). Engelmann spruce and subalpine fir are the climax species in this zone. Spruce is usually dominant, but subalpine fir may dominate at higher elevations and on wetter sites. Lodgepole pine is the prominent pioneer species following wildfire with whitebark pine occurring at higher elevations on drier sites. Non-forested wetlands are uncommon in the mountainous landscape of the ESSF. Meadows are present in this zone where soils remain moist through the growing season.

The Alpine Tundra zone (AT)

The Alpine Tundra zone (AT) occurs at high elevations and generally consists of non-arboreal communities. However, scattered krumholtz communities consisting of Engelmann spruce, subalpine fir, and whitebark pine exist at lower elevations. The climate in the Alpine Tundra zone is severe with winters being cold and snowy and summers being short and cool.

Review of Biophysical Sources

Specific biophysical research focussed on the following categories: (1) biophysical classification, (2) geomorphology and geology, (3) aquatic feature classification, and (4) flora and fauna. The major sources consulted in this research are briefly described below.

Biophysical Classification

Two major systems of biophysical classification are generally in current use in the study area: biogeoclimatic zones and ecosections. The best source of information on biogeoclimatic zones is Meidinger and Pojar (1991). The best description of the ecosection classification system is found in Demarchi et al. (1990). The most recent classification of the study area using these schemes is available in digital format from the B.C. Ministry of Environment (MoE). Further information is available at the B.C. Environment home page at <http://www.env.gov.bc.ca>.

Geomorphology and Geology

Geomorphological and geological landforms relevant to archaeological potential were investigated. Geomorphological landforms include those produced by glacial, fluvial (river), lacustrine (lake), colluvial (gravitational), and aeolian (wind) processes. The evolution and distribution of geomorphic landforms in the study area, and their significance for archaeological

IDFxm), often extensive, open stands of Douglas fir exist and are maintained by frequent ground fire. In denser stands, frequent crown fire may result in higher proportions of early seral lodgepole pine. Spruce occurs on moist sites and increases toward the transition with the Montane Spruce zone (IDFdk). Western red cedar may occur in mature stands transitional to the Coastal Western Hemlock zone in the Homathko and Mosley Valleys. Extensive grasslands, and non-forested wetlands are common in the IDF.

The Sub-Boreal Pine-Spruce zone (SBPS)

The Sub-Boreal Pine-Spruce zone (SBPS) is the predominant zone of the Chilcotin Plateau. Climate in the SBPS zone is characterized by cold, dry winters and cool dry summers. Mean annual temperatures range between 0.3-2.7°C, with mean annual precipitation between 335-580 mm. The SBPS zone occurs at elevations between 850 and 1500 m. It is above the Interior Douglas Fir zone which follows the Chilcotin River and its main tributaries, and is adjacent to the western edge of the Sub-Boreal Spruce which flanks the windward side of the Cariboo Mountains along the Fraser and Quesnel Rivers. This zone is below the Montane Spruce which occupies the higher plateau in the Chilcotin. Upland, closed coniferous forests dominate the SBPS, with lodgepole pine being the dominant tree species, especially in the driest subzone (SBPSxc) in the rainshadow of the Coast Mountains. White spruce is a common understorey tree and reaches the canopy as stands age. Spruce is more common in moister subzones (SBPSmc and the SBPSmk) and along the periphery of riparian areas. Spruce rarely attains dominance because frequent wildfire maintains dense, young seral pine stands which are characteristic of this zone. Douglas fir is a minor component of these forests and occurs generally only on warm, south-facing slopes. Douglas fir is most common in the warmest subzone (SBPSmk), east of the Fraser River, near Williams Lake. Non-forested wetlands are common in this zone, due to the poorly developed drainage on the plateau surface. Grasslands are uncommon, but may occur on south-facing xeric sites.

The Sub-Boreal Spruce zone (SBS)

The Sub-Boreal Spruce zone (SBS) is widespread in the central interior. The climate is continental with severe, snowy winters and warm moist summers. Mean annual temperature ranges from 1.7-5°C, with mean annual precipitation between 440-900 mm. In the study area, the SBS zone occupies the Fraser basin. It is adjacent to the Sub-Boreal Pine-Spruce zone in the west and below the Engelmann Spruce-Sub Alpine Fir zone, which occurs on the western slopes of the Cariboo Mountains. The SBS extends from the valley bottoms to 1100-1300 m elevation. Upland, closed coniferous forests characterize this zone with white spruce and subalpine fir representing the dominant climax species. Lodgepole pine is a prominent species in younger seral stands in the drier subzones (SBSdw) and Douglas fir is also prominent in the dry, warm (SBSdw) and moist (SBSmw) subzones of this zone. Since this is a moist zone, wildfire is less frequent than in the SBPS. Non-forested wetlands are common in this zone due to the poorly developed drainage on the plateau surface. Grasslands are generally uncommon in this zone.

The Montane Spruce zone (MS)

The Montane Spruce zone (MS) is a transitional zone between both the Sub-Boreal Pine Spruce zone and Interior Douglas Fir zone below, and the Engelmann Spruce-Subalpine Fir zone above. The climate is relatively dry with winters being cold and summers being short and warm. Mean annual temperatures range from 0.5-4.7°C, with mean annual precipitation between 380-900 mm. Elevations in this zone range from 1250-1700 m. Closed coniferous forests characterize this zone.

potential, are described in Appendix G. Geological landforms include those volcanic deposits which may include the lithic sources of vitreous (glassy) basalt and obsidian used in stone tool manufacture. Most information on the classification and distribution of geological and geomorphological landforms is only available from maps.

Various glacial landforms are mapped for the entire study area at a scale of 1:250,000 by the Geological Survey of Canada (GSC) and described in an accompanying report by Tipper (1971a). Landforms identified on these maps which have an application in archaeological potential mapping include large meltwater channels (forming terraces adjacent to streams and waterbodies), small meltwater channels (forming ravines), and glacial lake deposits. Fluvial, lacustrine, colluvial, and aeolian landforms and deposits are mapped at a scale of 1:50,000 and described on provincial soils and surficial geology maps for a portion of the study area. The usefulness of the glacial landform and the soils and surficial geology maps is reviewed in Appendix J.

The bedrock geology for only a portion of the study area has been mapped and described. Several small areas of the Coast Range have been mapped for mineral potential, but these maps were not useful for identifying possible lithic sources. The bedrock geology of the northwest portion of the Chilcotin Forest District (roughly corresponding to National Topographic Survey map 93C) has been mapped at a scale of 1:253,440 by the GSC. Unfortunately, the resolution of this mapping does not allow for the identification of volcanic deposits of vitreous of basalt and obsidian. However, known vitreous basalt and obsidian deposits were identified through a review of archaeological reports and B.C. Site Inventory forms. Numerous archaeological sites with evidence of obsidian sources (bedrock and stream cobble) and quarrying are recorded in the Obsidian Creek drainage (including Grizzly Creek and Tsitsutl Peak) and on Anahim Peak (Apland 1979; Nelson and Will 1976). On the basis of this site distribution, a volcanic formation (Ootsa Lake Group) on Anahim Peak was identified as a possible lithic source for the obsidian cobbles observed at the lower Obsidian Creek sites. To account for the sites relating to obsidian procurement in this area, the entire Obsidian/Grizzly Creek drainage and Anahim Peak was identified as a "lithic procurement zone".

An additional obsidian quarry site has been recorded near Tundra Lake in the Ilgachuz Mountains. On the basis of this single site, it was not possible to identify a volcanic formation as a possible lithic source, or define a watershed boundary as a lithic procurement zone. After the model of archaeological potential was developed, a recent GSC report and map of the bedrock geology of the Ilgachuz Range came to the attention of the Arcas team (Souther and Souther 1994). This report identified several volcanic deposits which include vitreous lithics and which may be the lithic source for the Tundra Lake site. Unfortunately, this information was obtained too late to be incorporated in the model of archaeological potential. Future versions of the model should consider and potentially incorporate the data available from this report and map.

A single vitreous basalt quarry site also was recorded as part of the community research component of this AOA in late 1997. The extent of the lithic source at this site was not investigated, and additional quarry sites may be located in the surrounding area. As the quarry site is located in an area with high potential, a specific lithic procurement zone was not considered necessary at this point. If additional survey in the vicinity of quarry site identifies more sources, future versions of the model should incorporate a lithic procurement zone in this area.

subsistence fish species (rainbow trout, kokanee, whitefish, suckers) was investigated using Federal and Provincial inventory data as well as specific research reports (Kuhn 1996) and species accounts (Scott and Crossman 1973). Potential anadromous salmon streams and potential high value fish streams were identified using Forest Practices Code guidelines for interior fish-stream identification (B.C. Forest Service and B.C. Environment 1995b). A salmon stream network was developed by applying the Forest Practices Code guidelines to digital TRIM stream gradients. This network was then cross-checked against federal and provincial inventory data, available in paper format in reports by the Department of Fisheries and Oceans (1991) and in digital format as the Fisheries Information Summary System (FISS). For more information see the Department of Fisheries and Oceans home page at <http://habitat.pac.dfo.ca>. Likewise, potential high value fish streams were identified by applying the Code guidelines to digital TRIM stream gradients. To ensure that they were correctly identified, the distribution of fish streams was checked against Kuhn (1996) and Scott and Crossman (1973).

Using Tyhurst (1984), Alexander (1997), and other ethnographic sources, the important subsistence mammal species were identified. The generalized historic and current distribution of these species was reviewed using species accounts, notably Cowan and Guiget (1965), maps included in the Cariboo report by the Commission on Resources and Environment (1994), as well as wildlife capability mapping available in digital format from the MoE (see the B.C. Environment home page at <http://www.env.gov.bc.ca>). For the most part, the distribution of mammals is fairly generalized, and most closely corresponds to biogeoclimatic zones. For example, mountain goats were found to be generally restricted to ESSF and AT zones, while black bears ranged through most forested biogeoclimatic zones.

Research on mammals focussed on the specific distribution and capability of the major ungulate game species. In particular, the historic distribution of elk and moose was reviewed in two reports by Spalding (1990, 1992) and in consultation with MoE staff. According to these sources, the historic distribution of both species is uncertain. However, it appears that the current distribution of moose may largely reflect the historic replacement of elk (Rodger Stewart, MoE, personal communication 1998). As such, current moose distribution may be the best approximation of past elk distribution. The distribution of mule deer and caribou was also investigated in consultation with MoE staff (Rodger Stewart, Chris Schmidt, Jim Young, MoE, personal communication 1998). A recent report by the Mule Deer Winter Range Strategy Committee (1996) was most useful in defining critical mule deer winter range, and digital maps of mule deer winter ranges were obtained from the MoE. Present day critical caribou habitat was identified in a report by the CCLUP Caribou Strategy Committee (1996). However, the MoE wildlife capability mapping is probably the best approximation of past caribou distribution (Chris Schmidt, MoE, personal communication 1998).

Aquatic Feature Classification

Aquatic features are identified on digital TRIM maps as "doubleline" streams, "singleline" streams, "indefinite" streams, lakes, and wetlands (swamps, marshes, fens, and bogs). For the purposes of this AOA, it was necessary to classify streams, lakes, and wetlands on the basis of resource value. Two major systems of aquatic feature classification were reviewed for this: the B.C. Forest Practices Code operating guidelines and the B.C. Watershed Atlas.

The Forest Practices Code system classifies: (1) *streams* according to (a) the presence or absence of fish (or fish potential), and (b) average stream width (B.C. Forest Service and B.C. Environment 1995a, 1995b), and (2) *lakes and wetlands* on the basis of (a) area, and (b) which biogeoclimatic unit they are found in (B.C. Forest Service and B.C. Environment 1995a). The B.C. Watershed Atlas program classifies streams on the basis of order and magnitude, where (a) order refers to the place of the stream reach within the larger drainage system (e.g., a first order stream does not have any feeder streams, a second order streams is formed by the confluence of two first order streams, and so on), and (b) magnitude refers to the estimated volume of water flowing within a stream reach based on the number and length of feeder streams. The B.C. Watershed Atlas is available in digital form from the MoE (see the B.C. Environment home page at <http://www.env.gov.bc.ca>).

Of the two systems, the Forest Practices Code operating guidelines were considered to be more appropriate for this AOA, because: (1) it provides a single system for classifying all aquatic features, (2) the system is more compatible with forestry practices, (3) the classification of streams is based on resource value (fish values), (4) the system is more compatible with TRIM digital features, and (5) the resolution and accuracy of Watershed Atlas streams was lower than TRIM streams.

Flora and Fauna

The distribution and abundance of important subsistence plant and animal resources was investigated. This research focussed on four areas: (1) specific plant resources, (2) generalized vegetation communities, (3) anadromous salmon and fish, and (4) mammals.

The plants traditionally utilized by aboriginal people in the study area were identified by examining Tyhurst (1984) and Alexander (1997), as well as through a review of information compiled in the Traditional Activity Table (Appendix B). Although many plant species were used traditionally, only a few of these involved gathering and processing activities which resulted in archaeological evidence. In particular, mountain potatoes, balsamroot sunflower, huckleberries, and whitebark pine nuts were processed in roasting pits. Bark and cambium stripping also resulting in the modification of lodgepole pine and western red cedar trees. The distribution of specific plants was investigated using species accounts, notably Parish et al. (1996). The generalized distribution and abundance of root and berry crops by biogeoclimatic zone was determined by consulting Meidinger and Pojar (1991). The generalized distribution and abundance of lodgepole pine, western red cedar, and whitebark pine, was determined using provincial inventory data available from Forest Cover mapping supplied by the Ministry of Forests in digital form. Wherever possible, the historic range of these species was considered by incorporating data on the shift of biogeoclimatic zones (see Appendix G).

Important subsistence fish species were identified using ethnographic studies, primarily Tyhurst (1984). The distribution of anadromous salmon (chinook, sockeye, steelhead) and other important

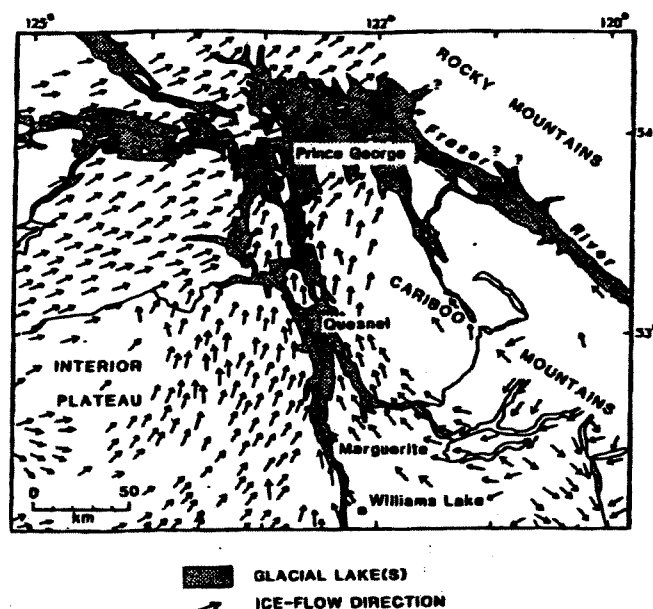


Figure G1: Glacial ice flow directions and extent of deglacial lakes in the Central Interior Plateau, British Columbia: Source: Clague (1988).

Clague suggests that this lake existed for less than 100 years. Valley glaciers, still connected to the accumulation areas in the mountains, gradually retreated. Clague (1987) and Huntley and Broster (1997) suggest that short-lived lakes also existed in portions of tributary valleys such as the Chilcotin and Taseko as a result of these valleys being dammed between retreating ice lobes.

Deglacial and early post-glacial processes included the gradual lowering of base-level of ice-dammed lakes, aggradation of alluvial fans, and, as sediment supplies declined, the gradual down-cutting of rivers into drift deposits and fans, producing terraced valley fills in the trunk valleys. Incision by fluvial processes destabilized drift deposits which lead to widespread slumping in terraced areas (Clague 1988; Huntley and Broster 1997).

The timing of deglaciation and the establishment of the modern drainage is generally constrained for the study area. Clague (1981) indicates that minimum dates for deglaciation get younger toward the west, reflecting the general retreat of ice into the mountains, and suggests that the Interior Plateau was ice-free by about 11,000 BP. On the Fraser Plateau, Souther et al. (1987) and Clague (1988), report two dates of about 10,000 BP indicating the minimum age for deglaciation of upland areas east and west of Quesnel. Souther et al. (1987) suggest that pioneering scrub occupied the uplands between 10,500 and 10,000 BP, and Driver et al. (1996) indicate that paleo-indians were accessing these early post-glacial environments as early as 10,500 BP. Fulton (1969) reported a minimum age of about 9800 BP for deglaciation of the uplands in the Southern Interior, and a minimum of about 9000 BP for complete deglaciation, drainage of all glacial lakes, and establishment of modern drainage. Clague (1988) suggests that the large glacial lakes were drained between 11,000 and 10,000 BP, and Clague (1987) also reports an age of about 9000 BP for the existence of a small lake that was a successor to an ice-dammed lake in the Williams Lake area.

APPENDIX G: Palaeoenvironmental Research

Introduction

An introduction to the palaeoenvironmental research conducted in this AOA was provided in the **Final Report**. This appendix provides additional details on the following: (1) glacial and post-glacial history of the study area, (2) a review of paleoecological studies in the Quesnel and Chilcotin Forest Districts and the interior plateau in general, (3) paleoclimate of south central British Columbia, (4) ecological considerations for vegetation reconstruction, (5) reconstructed xerothermic and mesothermic biogeochrons, and (6) summary and conclusions.

Glacial and Post-glacial History by Pierre Friele, Bauman Engineering

The interior of British Columbia was over-ridden during the Fraser Glaciation, with ice flowing from the Coast and Cariboo Mountains merging on the Fraser Plateau and flowing northward. The earliest post-glacial dates in the study area indicate ice-free conditions by at least 10,000 BP, but possibly as early as 11,000 BP (Clague 1988). The early post-glacial period was dominated by landform readjustment, with widespread erosion and mass movement. Slope wash and aeolian activity contributed to unstable soil conditions hindering vegetation colonization. Plants migrated into this landscape at varying rates forming continually evolving vegetation associations. It took a few thousand years for soil stabilization and development to occur (Macdonald 1987), allowing for secondary succession to proceed.

The entire study area was extensively glaciated a number of times during the Pleistocene (Clague 1981, 1987, 1988; Ryder et al. 1991; Tipper 1971a, 1971b). Alpine ice accumulated in the Coast and Cariboo Mountains and expanded to fill the main trunk valleys. These trunk glaciers eventually coalesced into mountain ice sheets, and then spilled out onto the plateau. Piedmont lobes flowed east and west from the main ranges and converged on the Interior Plateau, with the flow indicators showing separate streams directed to the southeast and northwest along the axis of the plateau (Figure G1). The divide for this north/south split was located in the Gang Rang area, near Williams Lake (Ryder et al. 1991; Tipper 1971a, 1971b). At the glacial climax, only the highest peaks would have projected through the ice as nunataks (Huntley and Broster 1994).

Extensive plains of glaciofluvial outwash developed in front of the advancing valley ice. As these outwash plains extended to meet the main valleys, broad alluvial fans formed which blocked drainage of the main valleys, forming proglacial lakes. Eventually the ice itself reached the main valleys causing further blockage before over-riding the area (Clague 1987, 1988; Huntley and Broster 1994).

A model of deglaciation for the interior has been described by Fulton (1967). Deglaciation proceeded by downwasting and thinning of the ice mass. In the interior, extensive areas of ice became isolated from the ice accumulation areas, and lay stagnant in the main valleys, contributing to the formation of an extensive network of deglacial lakes. In the Quesnel area, ice blocked the southerly flow of meltwater producing a large glacial lake that occupied the Fraser Basin from Marguerite northward (Figure G1), filling the valleys to an elevation of about 800 m (Clague 1988).

- In the mountains, glacial features consist of cirques. Surficial materials, primarily till and colluvium, are thin. On the Fraser Plateau, glacial features, including drumlins, small meltwater channels, eskers, and kettles are common and surficial materials are dominated by glacial till, with minor amounts of glaciofluvial and lacustrine materials associated with specific features. Small wetlands are common on the fluted landscape of the plateau upland.
- Along the axes of the trunk valleys (Blackwater, Chilcotin, Quesnel, Fraser) and the lower reaches of the tributary valleys (Taseko, Chilko, Nazko), thick deposits of glacial drift are widespread. This drift is prone to instability along terrace edges, and in many places, slump scarps and deposits are widespread (see Huntley and Broster 1997).
- Para-glacial alluvial fans occupy the mouths of many basins (see Tipper 1971b). In the study area, these features are most common along the main valleys and in the mountainous terrain of the Coast and Cariboo Mountains. Many of these fans are dissected and inactive, reflecting a decline in sediment supply in the mid-to-late Holocene.
- Fluvial terraces are found along the axes of the modern drainage system, and active floodplains are confined to valley bottoms.
- Loess veneer is extensive throughout the study area, especially in the vicinity of terrace scarps. Dune fields are locally distributed in upland areas. For example, at site EkSe 1 at Horn Lake (Mitchell 1964, 1970), and occur at a few localities along the main valleys (e.g., in Farwell Canyon).
- Hill slope processes have been active throughout the Holocene and remain active today. Slopewash, landsliding and debris flow activity affect steeper slopes and leave apron or fan-shaped deposits at the base of slopes.

Review of Paleoecological Studies in the Study Area

Paleoecological studies reconstruct the shifting mosaic of plant communities through time, and give insight into climate change and changes in climate-mediated ecological factors such as fire frequency. Examination of selected pollen cores, representative of various biogeoclimatic zones, gives insight into local and regional vegetation changes. Cores and fossil wood from the Alpine Tundra ecotone give data on timberline shifts. Knowledge of timberline shifts is useful because it has been shown that timberline elevation is closely linked with temperature: temperature decreases 0.65°C with every 100 m increase in elevation (Tranquillini 1979). Observed timberline shifts in the vicinity of the study area can be used to estimate mean summer temperature for the period of higher timberlines.

A number of published, radiocarbon-dated, paleoecological studies are available for the southern interior of British Columbia, Alberta, and the Yukon. However, very few studies are available for the Central Interior of British Columbia. Representative pollen cores from dominant biogeoclimatic

Fluvial downcutting would have begun after about 10,000 BP; base levels on the Fraser River were about 70 m higher than present at that time. The rate of downcutting of the main river valleys is not well defined, but probably proceeded quite rapidly. Many middle elevation terraces south of the study area are covered by Mazama ash indicating downcutting before 6600 BP (see Arcas Associates 1985). Clague (1988) reports that the Fraser Basin base-level was less than 10 m above its modern elevation by 2000 BP and no more than 1-2 m above present by about 1000 BP. Downcutting in the tributary valleys may have followed a similar schedule, as Alexander and Matson (1987) report an age of about 1000 BP for an archaeological site (EkSa 33) situated on a terrace 1-2 m above the Chilko River at Brittany Creek.

As downcutting proceeded through the horizontally bedded lavas that underlay the Fraser Plateau, lateral channel migration or erosion into weaker layers may have produced overhanging outcrops. These may have been used as rock shelters by early peoples.

The post-glacial history of the landscape cannot be discussed without reference to the para-glacial concept (Church and Ryder 1972). In the deglacial and early post-glacial period, materials deposited by glacial processes were left unstable following ice retreat, and were readily reworked by colluvial and fluvial processes. The most conspicuous product of para-glacial activity in the interior was the development of large alluvial fans issuing from side valleys and steep basins (Ryder 1971). These features grew most rapidly in the first few thousand years following deglaciation, but many were still active after 6600 BP, as evidenced by the existence of alluvial deposits overlying Mazama ash in fan exposures.

In the early post-glacial and during the warm/dry "xerothermic" at the beginning of the Holocene, vegetation was sparse. Aeolian activity led to the formation of loess deposits, and dune systems in some areas (e.g., Horn Lake in Mitchell 1964, 1970). Aeolian activity is ongoing in terraced areas as materials exposed in scarps are reworked by strong valley winds (Clague 1987).

Increased precipitation and cooling beginning between 7000 and 4500 years ago, led to a rise in lake levels and wetland development. Expansion of forests during this time led to a decrease in aeolian activity, but may have led to increases in debris flow activity (Spooner et al. 1997), terrace edge slumping (Thomson and Mekechuk 1982), and earth flow movement (Bovis and Jones 1992). This wetting/cooling climate trend triggered Neoglacial activity in the Cordillera. Three Neoglacial phases have been recognized, with the earliest beginning about 5600 BP (see Ryder 1989).

Late Holocene processes include modern rates of aeolian, fluvial and colluvial activity. Rockfall and rocksliding are ongoing processes in steep and mountainous areas. A large landslide at Texas Creek, just south of Lillooet, at approximately 1200 BP temporarily blocked the Fraser River causing a short-term rise in base level (Ryder et al. 1990) and channel aggradation. Although slumping into rivers may have been common, the occurrence of these dramatic damming events was probably not common; impoundment events within the study area have not been documented.

The distribution of surficial materials and landforms in the area can be described with reference to the glacial and post-glacial history described above and include:

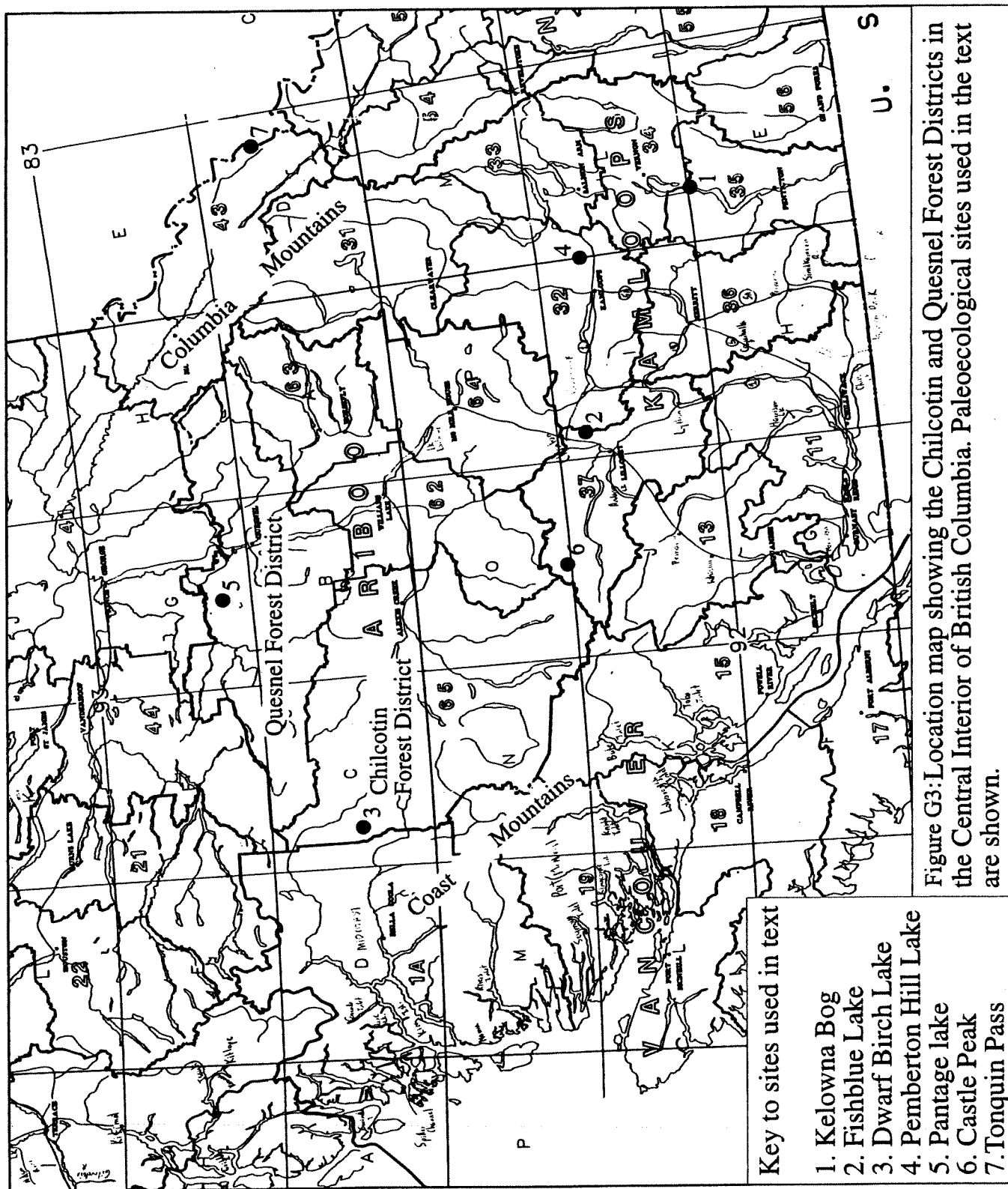


Figure G3: Location map showing the Chilcotin and Quesnel Forest Districts in the Central Interior of British Columbia. Paleoecological sites used in the text are shown.

zones within the study area, and from adjacent zones which may have had analogues in the area in the past, are included in Figure G2. No cores are available for the Interior Cedar Hemlock (ICH),

	Paleovegetation zones						Treeline fluctuations		Neoglacial advances
	Hebda Grasslands	Kelowna PP	Pemberton Hill IDF	Fishblue IDF	Dwarf Birch ESSF	Pantage Lk SBS	Castle Peak timberline	Tonquin Pass timberline	
0									Late phase
1				Diverse forests					
2	modern extent of grasslands		Diverse forest dominated by D. fir	increasing moisture and cooling	Spruce fir Lodgepole	Spruce dominated forest			Middle phase
3		Ponderosa with D.fir							
4				dominated by D.fir	slight fir reduction				
5			D. fir with open clearings	increasing moisture	Fir & spruce wetter/cooler	Spruce increases cooling			Early phase
6	grassland extent reduced D.fir and Ponderosa expand							sharp retreat	
7		Grassland with Greasewood hot/dry				forests close-in		Treelines up to 150 m higher	
8			soapberry sage juniper	Spike moss and fern D. fir forests & clearings	Lodgepole	Lodgepole spruce with grassland			
9	grassland maximum	Ponderosa spruce base	grasslands			base	Treeline up a minimum of 60-130 m		
10			Lodgepole cool dry base	Pioneering forests	base				
11	Pioneering grassland			base					

Figure G2: Paleovegetation, paleoclimate inferences, and Neoglacial phases in the south and central Interior of British Columbia. Sources from left to right: Hebda (1982); Alley (1976); Hebda (1995); Mathewes and King (1989); Hebda (1995); Hebda (1995); Clague and Mathewes (1989); Kearney and Luckman (1983a); Ryder (1989). See Figure G3 for location of sites.

Montane Spruce (MS), or the Sub-Boreal Pine-Spruce (SBPS) zones. The only data for the SBPS consists of a single pollen spectrum representing vegetation conditions about 10,000 BP (Souther et al. 1987). One core from the ICH in the Slocan Valley, southeast of the study area, is generally described by Hebda (1995). The lack of a core from the SBPS is troublesome, because this zone is potentially sensitive to warming, and occupies an extensive area in the Chilcotin Forest District. A core from the Coastal Western Hemlock zone has not been included, because this zone occupies a small portion of the study area. The cores from the Sub-boreal Spruce zone (Pantage Lake) and the Engelmann Spruce-Subalpine Fir zone (Dwarf Birch Lake) are very generally described in Hebda (1995), and are not available in detail elsewhere. The timberline sites lie on the ESSF/AT ecotone. The Neoglacial chronology has been included because the timing of Neoglacial phases should be broadly coincident with cooler/wetter periods in the late Holocene, giving insight on vegetation trends.

Data from Dwarf Birch Lake (Hebda 1995) indicate closed forests throughout the Holocene. Lodgepole pine dominated forests existed until about 6000 BP, at which point spruce and subalpine fir increased, suggesting increased cooling. Forests similar to the ESSF zone developed after 6000 BP. The later development of the ESSF at Dwarf Birch Lake, compared to Tonquin Pass, may reflect the rainshadow influence in the lee of the Coast Mountains, or the lower elevational position of the site within the zone.

Timberline Fluctuations

Kearney and Luckman (1983a) reported data from three sites in the Rocky Mountains near Jasper. Based on a quantitative analysis of *abies/pinus* pollen ratios they provide a plot of timberline position with depth in the core. This analysis indicated higher timberlines between 8700 to 5200 BP, with high peaks between 6700 to 5900 BP and 8700 to 7000 BP. The highest timberline was 150 m higher than present indicating summer temperatures 1.0°C warmer than today. They reported a sharp lowering of timberline after 5900 BP, remaining close to present until 1600 BP and retreating to about 50 m below present, its lowest elevation, after 500 BP. This represents a cooling of 0.3°C during the Little Ice Age.

Clague and Mathewes (1989) reported fossil logs from above treeline at Castle Peak, between Tyaughton and Relay Creeks, just east of the southern tip of the Chilcotin Forest District. From the elevation and age of these logs, they estimated that treeline was 60 to 130 m higher, 8200 to 9100 BP. This translates to temperatures at least 0.4 to 0.8°C warmer during this period. Clague et al. (1992) analyzed isotope data from this same site and concluded that drier conditions also prevailed at this time.

Paleoclimate of South Central British Columbia

Anderson et al. (1989), Clague and MacDonald (1989), Hebda (1995), and Mathewes (1985) review and summarize the inferred Holocene climatic trends for the Interior of British Columbia. Heusser et al. (1980), Heusser et al. (1985) and Mathewes and Heusser (1981) apply climate transfer functions to pollen spectra to quantify mean temperature and precipitation changes.

The climate of the early Holocene is difficult to reconstruct because species migration and pioneering vegetation produced communities with no modern analogues; therefore, inferences cannot be made with confidence. Generally, a rapid rise in temperature and decrease in precipitation is noted after 10,000 BP (Hebda 1995).

A warmer/drier interval occurred during the early Holocene, with the peak between 7500 and 7000 BP. Mathewes (1985) proposed the name “xerothermic” for the period extending from 9500 to 7000 BP. Near the study area, timberline shifts up to 150 m higher than today suggest increase in summer temperature of 1.0°C (Clague and Mathewes 1989; Kearney and Luckman 1983a). At Marion Lake in southern British Columbia (Figure G4), Mathewes and Heusser (1981) indicate mean summer temperatures up to 2.0°C warmer and mean annual precipitation 600 mm lower than today. With a modern annual precipitation of 3000 mm at Marion Lake, this represents a 20% reduction in precipitation.

Bunchgrass zone (BG)

Hebda (1982) summarized vegetation trends throughout the grasslands of southern British Columbia. He concluded that the time of maximum grassland extent was between 10,000 and 8000 BP. Grassland extent was reduced after 8000 BP, and reached its modern extent after 4500 BP.

Ponderosa Pine zone (PP)

Alley (1976) described a core representative of the Ponderosa Pine zone near Kelowna in the Okanagan. In the core was evidence that grasslands had replaced ponderosa pine dominated forests in the area between about 8100 and 6600 BP. Ponderosa pine forests returned after 6600 BP associated with rising water tables at the location, suggesting increased runoff from upland locations and a moister climate.

Interior Douglas Fir zone (IDF)

Two cores are presented for the IDF. Hebda (1995) described a core from Pemberton Hill Lake located just north of the South Thompson River near Kamloops. This site is situated in the IDF zone between the Montane Spruce and the Bunchgrass zones. Hebda suggests that grasslands, and juniper woodland on moist locations, replaced open forests between 9800 and 7000 BP. Open Douglas fir forests established between 7000 and 4000 BP, closing-in after 4000 BP. This mid-to-late Holocene shift of forest type may be representative of a change from a drier to a moister variant of the IDF.

Mathewes and King (1989) describe in detail a core from Fishblue Lake, near Hat Creek east of Lillooet. Pioneering forests and grassland are present at this site from 10,600 to 9200 BP. Between 9200 and 6600 BP lodgepole pine decreases, and Douglas fir and the grasses increase. This period was probably characterized by open Douglas fir forest with dry clearings. Between 9200 and 8050 BP, fern (*Pteridium*) and spikemoss (*Selaginella*) spores and grass pollen percentages peak suggesting that this was the driest part of the Holocene. High *Pteridium* percentages indicate frequent disturbance, possibly wildfire. Forests close in after 6600 BP. Data from other locations (Mathewes and King 1989) indicate that rising water tables occurred after about 6000 BP and again, associated with cooling, after 2400 BP.

Sub-Boreal Spruce zone (SBS)

The record from the Pantage Lake core begins about 9200 BP. From 9200 to 7000 BP, lodgepole pine forests predominated, with high grass values suggesting that grassland openings were widespread. After 7000 BP, the forests closed in with lodgepole pine being dominant over spruce. After 5000 BP, spruce increases over lodgepole pine suggesting a shift to moister conditions. Hebda (1995) suggests that between 7000 and 5000 BP the forests at Pantage Lake were similar to the Sub-Boreal Pine-Spruce zone, and shifted to the modern Sub-Boreal Spruce zone after 5000 BP.

Engelmann Spruce-Subalpine Fir zone (ESSF)

Kearney and Luckman (1983b) report on a core from the Alpine Tundra just above the ESSF zone at Tonquin Pass near Jasper, Alberta. This core is representative of the upper levels of the ESSF east of the study area. Lodgepole pine forests existed from the base of the core at 9660 to 9000 BP. Between 9000 BP and 8040 BP, whitebark pine increased. Spruce and subalpine fir dominated the forest from 8040 BP to the present. Near Tonquin Pass, forests similar to the modern ESSF zone existed from about 8000 BP to the present.

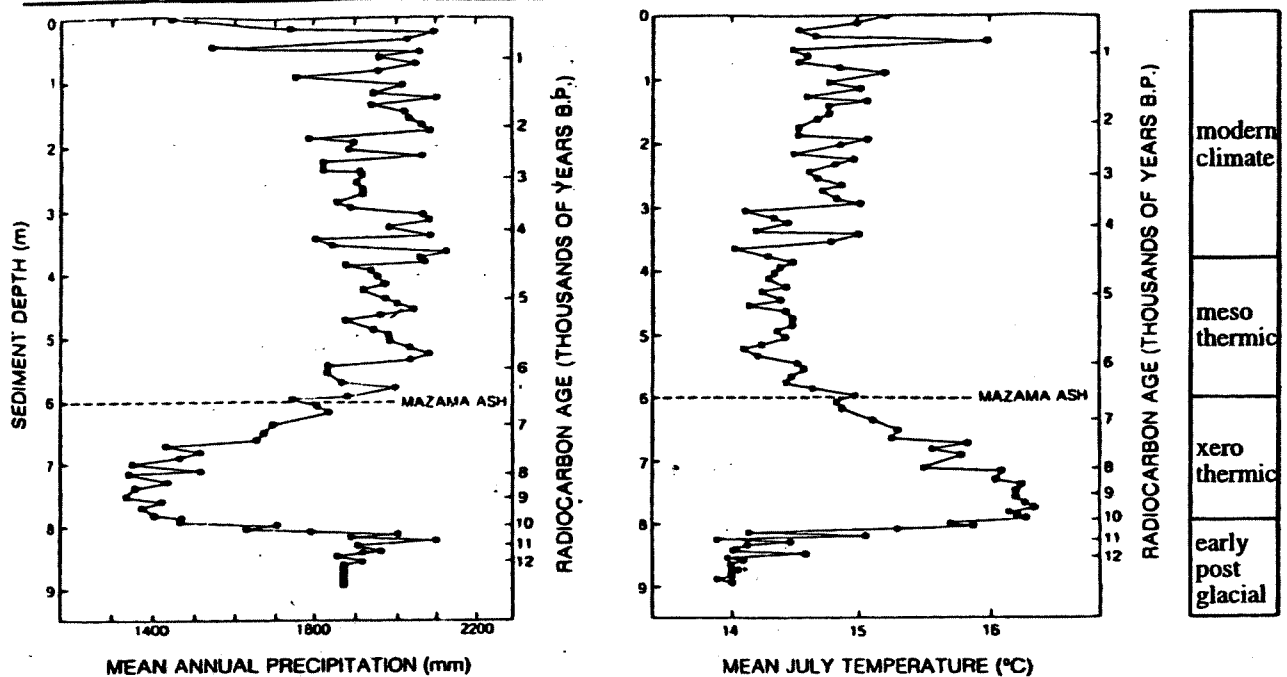


Figure G4: Reconstructed precipitation and temperature trends from Marion Lake, southwestern British Columbia. Source: Mathewes and Heusser (1981).

The shift from the xerothermic to the wetter/cooler climates of the late Holocene was not abrupt. As indicated above, most researchers indicate an increase in moisture beginning about 6600 BP. In his review of the paleoclimate data for British Columbia, Mathewes (1985) terminated this period at 7000 BP. However, the establishment of the modern climate was harder to define (Hebda 1995). Hebda (1982, 1995) suggests that the modern climate of the interior was established by about 4500 BP. Furthermore, the earliest dated housepits in the interior of British Columbia coincide with about 4500 BP (Strydom and Rousseau 1996), suggesting a human response to the modern cold/wet climate. Thus, the period about 7000 BP to about 4500 BP represents a transitory period of increasing moisture and cooling. Hebda (1995) has proposed the name “mesothermic” for this period.

Minor climatic fluctuations within the late Holocene broadly coincide with the timing of Neoglacial phases (Figure G2). For example, Mathewes and King (1989) noted increasing lake levels coincident with the early and middle Neoglacial phases, with cooling associated with the middle phase as well. A timberline retreat of 50 m suggests a cooling trend of at least 0.3°C during the Little Ice Age (Kearney and Luckman 1983a). For the late-Holocene, Mathewes and Heusser (1981) indicate variations in mean summer temperature of about 0.5°C and variations in mean annual precipitation of about 200 mm (6% of modern precipitation) (Figure G4).

Ecological Considerations for Vegetation Reconstruction

The previous section demonstrated that the communities (biogeoclimatic zones) defined in Appendix F have not remained stationary throughout the Holocene. This section attempts to answer a number of questions:

Douglas fir was present in the Southern Interior by at least 9000 BP and was a dominant constituent of forest there at that time. Kearney and Luckman (1983b) suggest that Douglas fir was present in small percentages by 9660 BP in the vicinity of Jasper, in the sub-boreal transition. However, Hebda (personal communication 1998) feels that Douglas fir may not have been an important enough constituent of Sub-Boreal transition forests to form IDF-like biogeochrons in the early-to-mid Holocene. Lodgepole pine, subalpine fir, and spruce were present in the study area quickly following deglaciation.

Working in the boreal forests of northern Alberta, MacDonald (1987) quantitatively compared pollen spectra (1000 year intervals) against modern spectra from various ecologic zones to assess rates of change of past communities, and the similarity of past vegetation to modern vegetation. He found that the fossil pollen spectrum between 11,000 and 9000 BP had no modern analogues, and that vegetation communities were continually changing. The communities between 9000 and 8000 BP had possible analogues with the modern Northern Boreal forest; between 8000 and 6000 BP forests had possible analogues with the modern Southern Boreal forest; while forests from 5000 BP to the present had clear analogues with the Sub-Boreal forests of the study site.

In view of MacDonald's analysis, modern analogues may have existed within the study area as early as 9000 BP. The late arrival of Douglas fir, western red cedar, and western hemlock may not allow for the existence of IDF-like and ICH-like biogeochrons during the xerothermic and mesothermic in the Cariboo Forest Region (Quesnel and Chilcotin Forest Districts). During these periods biogeochrons occupying modern IDF and ICH forests may have resembled SBPS forests.

Thus, the early period from 11,000 to 9000 BP consisted of pioneering communities with no modern analogues. In forested zones of the Cariboo Forest Region, most communities would have consisted of open scrub forest communities dominated by soopalallie (*Shepherdia*), willow, and lodgepole pine (Souther et al. 1987). At Charlie Lake Cave, north of Fort St. John, in an area now occupied by boreal forest, Driver (1988) indicates a shift from a tundra-like community to a forest community about 10,000 BP. In the study area, the areas presently occupied by the drier subzones of the Interior Douglas Fir and Sub-Boreal Pine-Spruce zones may have been dominated by grassland.

For the period from 9000 to 4500 BP, biogeochrons with modern analogous may have existed in the study area. The Holocene thermal maximum existed from roughly 9500 to 7000 BP, with summer temperatures 1-2°C higher and significantly less (-20%) precipitation. Fire frequency and summer drought would have been the primary ecological factors driving change. From 7000 to 4500 BP, climate was in transition to the cooler/moisture conditions of the present, with a gradual reduction in fire frequency and drought. All important boreal tree species were present by 9000 BP, but Douglas fir probably did not increase in importance until after 7000 BP.

The distribution of modern biogeoclimatic zones probably can be extended back to about 4500 BP. Climatic oscillations corresponding with the phases of the Neoglacial caused small ecotonal shifts and readjustments, and led to some shifting of dominance of the zonal species; however, the general pattern remained the same.

- When was the modern distribution of biogeoclimatic zones established?
- What were the earlier vegetation communities like?
- To approximate earlier communities, is it possible to simply adjust the present zones to some other configuration?
- Or, were earlier communities completely different?

Pollen cores representative of a number of the biogeoclimatic zones in the study area show how the vegetation in the vicinity of those sites varied. However, detailed data do not exist for most subzones, nor all the biogeoclimatic zones in the area. For example, there are no detailed cores representative of the Sub-Boreal Pine-Spruce zone which occupies large areas in both the Chilcotin and Quesnel Forest Districts.

To answer the questions posed above, an understanding of the ecological tolerances of the individual species that make up a zone is needed. For example, Douglas fir and lodgepole pine are fire adapted, but Douglas fir is more resistant to drought, while lodgepole pine is more resistant to cold. Subalpine fir and spruce are tolerant of cold and shorter growing seasons, while a dominance of subalpine fir is often noted as an indicator of more moisture.

Past climate may be the primary factor that drives vegetation change. However, climate-mediated factors (e.g., fire regime or edaphic changes) are often the most important factors driving the vegetation response at the stand and even the regional scale, and on shorter time scales (1-1000 years; Delcourt et al. 1983). Many authors (e.g., Mathewes 1985) have noted that an increase in the frequency of wildfire played an important role in shaping forests during the xerothermic interval. Cwynar (1987) demonstrated that it was not the degree of change in summer temperature that accounted for the rise of Douglas fir in the North Cascades Range during the early-to-mid Holocene, but rather, a dramatic increase in fire frequency conditioned by a relatively small change in temperature that opened up the forest and favoured the dominance of Douglas fir, a fire resistant species.

Hebda (1997) and Hebda and Whitlock (1997) stress that exact modern analogues for past communities do not exist. Hebda and Whitlock (1997) coined the term “biogeochron” to describe past (or future) vegetation associations. The difficulty in defining past assemblages stems from the fact that because of the different ecological tolerances of individual species, their response to forcing factors will vary. As a result, biogeochrons do not shift as a unit, but individuals that make up the biogeochron shift in space and time at distinct rates, and regroup as new biogeochrons at a later date. With zones that are characterized by a single dominant species, such as Douglas fir, it may be easier to infer past states.

The problem is further complicated in British Columbia because species were migrating into recently deglaciated areas during a period of rapid climate change: migration patterns and soil development exerted a large influence on community structure. For example, in the vicinity of the study area, hazelnut did not arrive until after 3000 BP (Mathewes and King 1985). Similarly, western red cedar had a relatively late arrival time on the coast (5000-4000 BP; Hebda and Mathewes 1984), and possibly after 4000 BP in the ICH zone of the Cariboo Forest Region (Hebda 1995). Western hemlock may also have been delayed to after about 5000 BP in the northeastern ICH forests (Hebda 1995). Most importantly, the migration history of Douglas fir is poorly known for the study area.

Before considering biogeochronal shifts for the period between 9000 BP and 4500 BP, the following general trends should be expected for all zones (after Hebda 1997):

- Upslope migration of timberlines and ecotones. In the study area, the alpine ecotone was up to 150 m higher during the xerothermic and perhaps 70 m higher during the mesothermic.
- Disappearance of forested ecosystems in regions of already warm and dry climate. The drier subzones of the Interior Douglas Fir and Sub-Boreal Pine-Spruce zones may have reverted to grassland communities.
- Northward migration of forest types.
- Change in disturbance regime. An increase in the frequency of wildfire and drought would have been the predominant ecological factor, with the highest frequencies in the period between 9000 and 7000 BP.

Reconstructed Xerothermic and Mesothermic Biogeochrons

Past patterns within the modern Interior Douglas Fir zone (IDF)

Vegetation changes in the IDF were described in **Review of Paleoecological Studies in the Study Area** (above). During the xerothermic, grasslands would have existed in the driest zones of the IDF. The modern IDF subzones in the Chilcotin (IDFxm and IDFdk) are dry to very dry, with precipitation ranging from 270-450 mm and 325-640 mm respectively (Meidinger and Reynolds 1997). With 20% less annual precipitation, summer drought would have dramatically increased, and both zones presently occupied by IDF could have been occupied by grasslands. During the mesothermic, grassland communities would have begun their retreat from higher elevations, with very dry IDF forests expanding into this range.

Past patterns within the modern Sub-Boreal Pine-Spruce zone (SBPS)

The paleovegetation trends of the SBPS zone have not been studied, but ecological parameters suggest this is a sensitive zone (Hebda 1997). Souther et al. (1987) describe a 10,000 BP pollen spectrum from the SBPSmk. They describe early colonizing vegetation comprising open scrub communities dominated by soopolallie (*Shepherdia*), willow, and lodgepole pine. Warming, with increased fire frequency would have favoured fire tolerant species, and may have eliminated spruce, except in wet locations. Significantly reduced precipitation during the xerothermic would have favoured lodgepole pine forests and possibly grasslands, especially in the very dry subzones of the SBPS (such as the SBPSxc). Forests, especially in the moister subzones (SBPSmc), would have closed in during the mesothermic.

Past patterns within the modern Sub-Boreal Spruce zone (SBS)

The Pantage Lake core (Hebda 1995), located in the drier part of the SBSdw, indicates closed forests after 7000 BP, with spruce increasing after 5000 BP. Prior to 7000 BP, forests are dominated by lodgepole pine and grassland openings being common. Warmer temperatures and drier conditions during the xerothermic favoured lodgepole pine throughout this zone. However, the thresholds of the coldest and wettest subzones (SBSvk, SBSwk, SBSmc, and SBSmk) may not have been

Conclusions

The study area was almost entirely glaciated during the Fraser Glaciation. Only the highest peaks would have projected through the ice as nunataks. On the plateau, deglaciation proceeded by downwasting and stagnation, with upland areas becoming ice-free first. Ice in the mountain valleys retreated gradually. Extensive, but short-lived lakes occupied the Fraser Basin during deglaciation, as the southerly drainage was blocked by ice. Deglaciation of the plateau was largely complete by 11,000 BP, while deglaciation, drainage of all glacial lakes, and the establishment of modern drainage was complete by 9000 BP.

Geomorphically, the early Holocene was dominated by para-glacial activity: sediments were eroded from uplands and redeposited in alluvial fans in the lowlands, rivers were downcutting, producing terraced landscapes and widespread slumping along the main river valleys. Winds were mobilizing fine sand and silt producing extensive deposits of loess and localized dunes. Nazco Cone, a cinder cone 75 km west of Quesnel, erupted during this time.

During the late Holocene, geomorphic activity started to decline, as rates of erosion and sedimentation began to approach modern levels. The primary geological activities during this time consisted of minor colluvial and fluvial reworking of older materials, floodplain development, and continued development of terrace edge loess deposits. The shift to the wetter/cooler climate regime of the mid-to-late Holocene, led to higher water tables and expanded wetland development.

Figure G5 summarizes recommended Holocene vegetation communities to be used in the archaeological overview assessment for the Chilcotin and Quesnel Forest Districts. Published, detailed and well-dated paleoecological studies representing the various biogeoclimatic zones in the study area are lacking. Only two cores have been analysed in the area, and these are only generally described in the literature (Hebda 1995). Paleoecological reconstruction has had to rely mostly on inference from similar zones in adjacent areas.

The modern biogeoclimatic zone distribution probably can be extended back 4500 years. Prior to 4500 BP, vegetation communities did not have exact modern analogues. Hebda (1997) suggests that because many of the zones in the region today (SBS, SBPS, MS, and ESSF) include Douglas fir, they could shift to IDF-like zones with climatic warming of 2°C. However, the post-glacial migration history of Douglas fir into the study area has not been documented, and we do not know how prevalent Douglas fir was during the early-to-mid-Holocene. Hebda (personal communication 1998) feels that Douglas fir was not an important constituent of early forests and that lodgepole pine was dominant. For this reconstruction, I have used a model favouring lodgepole pine dominance in the xerothermic with possible Douglas fir expansion in the mesothermic.

Warmer, drier climates during the xerothermic and mesothermic, with an associated high frequency of wildfire and summer drought, favoured lodgepole pine, and later Douglas fir, for most areas now occupied by spruce and subalpine fir. Areas now occupied by modern Douglas fir and dry Sub-Boreal Pine-Spruce forests probably existed as grasslands during the thermal maximum. Western red cedar and western hemlock did not arrive until after about 4500 BP, and early-to-mid Holocene forests in the area of the modern ICH may have resembled Sub-Boreal Spruce, or Sub-

exceeded and spruce forests may have dominated in these, especially during the mesothermic. With Douglas fir migration after 6600 BP, IDF forests may have existed during the mesothermic in the hotter subzones.

Past patterns within the modern Montane Spruce zone (MS)

There are no cores representative of the Montane Spruce zone. This zone is transitional between the SBPS and IDF at lower elevations and the ESSF at higher elevations, with the spruce component giving it broad similarities to the latter. Warmer and drier conditions would have favoured lodgepole pine and Douglas fir over spruce. Xerothermic conditions may have consisted of lodgepole pine forests throughout this zone, with extensive grassland openings at lower elevations (e.g. in the drier subzones of the SBPS). During the mesothermic, forests would have closed-in and grassland openings would have become reduced at lower elevations. There was probably a strong upward shift (70-150 m) of the upper ecotone. IDF zones may have existed at lower elevations during the mesothermic.

Past patterns within the modern Engelmann Spruce-Subalpine Fir zone (ESSF)

At Tonquin Pass, ESSF-like forests were established by 9000 BP (Kearney and Luckman 1983b). The upper ecotone of this zone shifted upward up to 150 m during the xerothermic, with a general decline toward modern elevations during the mesothermic. Since the ESSF zone occupies mountainous terrain with strong topographic gradients, an upward shift of the whole zone was likely. Lodgepole pine would have been the dominant constituent of lower elevation forests between 9000 and 4500 BP when wildfire was more frequent. These stands may have resembled SBPS stands in the xerothermic and MS stands in the mesothermic.

Past patterns within the modern Interior Cedar Hemlock zone (ICH)

The ICH has a wide warm thermal regime (2-8.7°C) and high levels of precipitation (500-1200 mm), with the study area occupying the cooler and wetter ICH subzones. Thus, the climatic conditions during the xerothermic may not have exceeded the tolerances of the modern zonal vegetation. Western red cedar was not yet present, and western hemlock may not have arrived until after 5000 BP (Hebda 1995). During the early-to-mid Holocene, the primary species present would have included spruce, subalpine fir, and lodgepole pine. A 20% reduction of precipitation would not have reduced the mean annual precipitation below the tolerance of spruce and subalpine fir. However, under a regime of increased wildfire, lodgepole pine may have expanded at the expense of these two species. During the xerothermic, the forests may have had affinities with the SBS or the SBPS forests depending on the interplay between the mean annual precipitation and fire regimes. In the mesothermic, they may have resembled the warm, moist variants of the SBS, or the IDF with stands of spruce and subalpine fir on wetter and cooler sites.

Past patterns within the modern Coastal Western Hemlock zone (CWH)

Western red cedar was not present until after 5000 BP. Under a more frequent fire regime, Douglas fir, which was well established on the coast in the early to middle Holocene and which was an important constituent of the drier subzones of the CWH, may have dominated this zone giving it an IDF-like biogeochron.

Zone; subzone	IDF xm	IDF dk	SBPS xc	SBPS dc	SBPS mc, mk	SBS dw, mh, mw	ICH wk, mk	CWH ds	MS xv	ESSF
Climate	very dry mild	dry cool	very dry cold	dry cold	moist/cold wet/cool	dry/warm moist/hot	wet/moist cool	dry sub- maritime	dry/cool	cold
MAP (mm)	270 - 450	325 - 640	338 - 540	497 - 517	450 - 610	425 - 600	660 - 1725	990 - 2100	380 - 540	400 - 2200
MTWM (°C)	15.7-17.5	12-16.5	9.2-13.1	13.5-14.3	10.6-16.2	13.4-17	12.7-19	15.3-18.7	13.6-15.2	5.6-14.5
4.5 ka. B.P. to present	modern IDF	modern IDF	modern SBPS	modern SBPS	modern SBPS	modern SBS	modern ICH	modern CWH	modern MS	modern ESSF
7-4.5 ka. B.P. mesothermic	grassland; forest expansion	IDF drier	SBPS & grassland	SBPS	SBPS or IDF drier	SBPS or IDF moist	SBS or IDF moist	IDF moist	lower zone IDF drier; upper zone SBPS moist	timberline +70m; lower zone MS
9 - 7 ka. B.P. xerothermic	grassland	grassland	grassland	grassland with sparse forest	SBPS very dry	SBPS drier	SBS moist	IDF drier	lower zone grassland; upper zone SBPS drier	timberline +150 m; lower zone SBPS
11 - 9 ka. B.P.	pioneer grassland	pioneer grassland	pioneer grassland	pioneer forest/ grassland	pioneer open forest	pioneer forest	pioneer forest	pioneer forest	pioneer forest	pioneer forest

Figure G5: Summary of recommended biogeochronal shifts for the Chilcotin and Quesnel Forest Districts AOA model of archaeological site potential. Climate data are from Meidinger and Reynolds (1997). MAP is mean annual precipitation; MTWM is mean temperature warm month. For zone and subzone codes, and a discussion see text. This model assumes a 20°C rise in MTWM and a 20% reduction in MAP during the xerothermic. Also, it is assumed that Douglas fir did not become available as a potentially important constituent of forests until the mesothermic. For zones occupying mountainous areas there were strong elevational shifts of ecotones.

APPENDIX H: Modelling Information

Introduction

An introduction to and discussion of GIS and modelling conducted in this AOA was provided in Volume 1 of this **Final Report**. This appendix provides additional details on the following: (1) innovations on spatial analysis including the model processing code, terrain slope model, salmon and fish stream model, GIS tasks and the final GIS product, (2) the biophysical and cultural features or variables used in the model and reproduced in the Feature Table, and (3) the logical statements for the Chilcotin and Quesnel archaeological potential model presented in the original *ARC Macro Language* (AML).

Innovations in Spatial Analysis for Archaeological Predictive Modelling by Range and Bearing Environmental Resource Mapping Corporation

Model Processing Code

A set of "modules" was used to perform complex archaeological potential predictive modelling for the Quesnel and Chilcotin Forest Districts. The integrated set of *ARC Macro Language/Feature Manipulation Engine* (AML/FME) modules only requires raw vector spatial data as input. One of the AML modules contains user selectable "buffer" values, input data types, complex site type and feature type logical statements (as specified by professional archaeologists). Once the parameters are set, multiple 1:20,000 map sheets can be processed in one session. The code performs all tasks including feature data clipping, slope and terrain interpolation to 10 m, stream gradient classification, grid conversion, Euclidean distance calculations (similar to buffering only much more efficient), combining of all feature type layers, analysis of the biophysical feature values characteristic of each site type, the evaluation of all the site type ratings for each cell, and the conversion of the final model to vector format for systems without grid capability. When processing each Terrain Resources Inventory Mapping (TRIM) sheet, the code captures a portion of all adjoining sheets as well to compensate for features in that sheet, affecting potential values in the sheet being processed. The final output is a *10 m grid* of archaeological potential.

The Terrain Slope Model

By using a complex interpolation routine, a 10 m elevation grid is constructed using both hard and soft breaklines. Hard breaklines allow the user to introduce angular changes in slope such as hydrography, cliffs etc. This method is superior to just running a regular *Triangulated Irregular Network* (TIN) as the surface of the earth is not cut into flat facets 60 m on a side. Using this method the model is able to represent slope and the terrain as close to its natural state as is possible with the input data from the TRIM Digital Elevation Model (DEM). Employing this method, the user is able to pick up subtle terrain anomalies such as eskers, small terraces and landforms that would go unnoticed when using a TIN.

The Salmon and Fish Stream Model

A salmon network and fish stream model was developed using a procedure that maintains stream gradient AND stream class, type and fcode (i.e., River-Definite, River-Intermittent) without having to form a TIN first to extract the gradients. In addition the model did not use the hydrographic

Boreal Pine-Spruce in drier areas. In areas with steep topographic gradients (e.g., AT, ESSF, MS), ecotones shifted upslope as much as 150 m during the xerothermic, and gradually came down during the mesothermic.

Before 9000 BP forested communities had no modern counterparts, and consisted of open forest scrub dominated by lodgepole pine. In areas presently occupied by boreal forest, a shift from tundra to forest may have occurred about 10,000 BP. In this period, vegetation communities were continually changing in response to rapid climate changes, species migration, and soil stabilization and development.

breaklines which have been dithered or reduced in vector resolution from the TRIM water features. This is a mistake recognized by Geographic Data British Columbia (GDBC) which they will not repeat in TRIM II. The salmon model builds a river network from the lowest elevation in a study area and advances until it reaches a consistent barrier, or steep gradient. Barriers can be added where necessary. Salmon and fish streams were modelled using gradients suggested by local fisheries biologists and the Forest Practices Code.

GIS Tasks

In order to facilitate the completion of the GIS component of the project, six sequential tasks were established. Completion of one task allowed for implementation of the succeeding task. As the GIS program was developed, each succeeding task (from task 1 to 5) involved revisiting the previous task and refining its parameters. The six tasks were:

- 1) Feature data formatting - translate and combine basic TRIM/Forest Cover/Trail/Sites Biogeoclimatic Ecosystem Classification (BEC) data into study area wide coverages
- 2) Analysis of known site - biophysical features relationships: near and identity analysis, site and site proximity slope analysis (consider slope around the site not just at the exact spatial location)
- 3) Incorporate logical statements and other user inputs into the model processing code
- 4) Run sample test areas to help refine archaeological input
- 5) Run the code on all map sheets in one single process requiring NO user interaction
- 6) Deliver data on CD rom

The Final Product

The final product contains one field per site/activity type rating the cell's relative isolated potential value. The site type ratings are then summarized for each cell in a separate field (item). Fields containing the values for significant bio-physical features are also included in the final product. A typical grid of a single trim mapsheet contains approximately 3,000,000 grid cells with each grid cell containing over 65 site/activity fields and over 25 feature type fields. The one grid conveys over **250** million pieces of cell potential data. The grids are 10 to 100 times smaller than their vector polygon counterpart making the grid data queries, display, etc., much quicker than a vector approach. Users can display any of the feature or site type layers selected all contained in the same grid. Unlimited spatial analysis can then be performed using new datasets such as forest development plans etc. The output grids contain data for 100 m outside of the TRIM neatline so a mosaic of multiple grid sheets can be performed. The final gridded product is unmatched in all aspects including resolution, usability, and complexity and is compatible with ArcInfo, ArcView Spatial Analyst, and ArcInfo GRID. The output grids have also been converted to vector files (ESRI shape) for users without grid capability.

Feature Definitions Table

The following table (Table H1) lists all of the biophysical and cultural features or variables used in the model of archaeological potential. All of these features were available in digital form as GIS coverages. The tables indicates how the features were defined, the digital source for the GIS coverage, the codes used to identify the features in the GIS and model statements, and the buffers defined for each feature.

For more information on the sources of the digital coverages and a description of why these features were selected for the model, please refer to **Volume 1: Final Report**.

Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
Streams (fish values, based on gradients / magnitudes)	Salmon	double and single line streams, 0-8% grade, with salmon potential, networked to Chilcotin/Fraser R. (high salmon values)	S1 to S4 fish streams with high anadromous salmon probability	TRIM:	streamsalm	1	1st buffer = 0-50 m
						2	2nd buffer = 50-300 m
						3	2nd buffer = 300-1000 m
						4	3rd buffer = 1000-2500 m
	High Fish Values	double and single line streams, 0-12% grade, excluding salmon stream network (high fish values)	S1 to S4 fish streams with moderate-to-high probability of non- anadromous salmonids	TRIM:	streamfish	1	1st buffer = 0-50 m
						2	2nd buffer = 50-200 m
						3	2nd buffer = 200-500 m
						4	3rd buffer = 500-700 m
	Low/No Fish values	double and single line streams, >12%, plus all intermittent/ indefinite streams, all grades (low fish values)	S1 to S4 fish streams with moderate or low probability of fish, plus all S5 and S6 streams	TRIM:	streamothr	1	1st buffer = 0-50 m
						2	2nd buffer = 50-300 m
Lakes (excludes indefinite / intermittent lakes, reservoirs)	Large	>1000 ha (high resource value)	L1 lakes >1000 ha	TRIM:	lakelarge	1	1st buffer = 0-50 m
						2	2nd buffer = 50-200 m
						3	3rd buffer = 200-500 m
						4	3rd buffer = 500-1000 m
	Medium	100-1000 ha (moderate-high resource value)	L1 lakes between 100 and 1000 ha	TRIM:	lakemed	1	1st buffer = 0-50 m
						2	2nd buffer = 5-100 m
						3	3rd buffer = 100-300 m
						4	3rd buffer = 300-500 m
	Small	5-99.9 ha (moderate-low resource value)	L1 lakes <100 ha	TRIM:	lakesmall	1	1st buffer = 0-50 m
						2	2nd buffer = 50-300 m
	Very Small	<5 ha (low resource value)	L2, L3, L4 lakes	TRIM:	lakevs	1	buffer = 0-50 m

Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
Wetland (includes indefinite, intermittent lakes, all meadows, all types of wetlands: swamps, marshes, etc.)	Large wetlands & complexes	>5 ha (including complexes, if linked in TRIM)	W1, W5 wetlands	TRIM:	wetlarge	1	1st buffer = 0-50 m
						2	2nd buffer = 50-300 m
	Small wetlands	<5 ha	W2, W3, W4 wetlands	TRIM:	wetsmall	1	1st buffer = 0-50 m
						2	2nd buffer = 50-300 m
Slope	slope	slope (quintic)	n/a	TRIM/DEM:	slope	1	<15%
						2	15-30%
						3	30-45%
						4	45-60%
						5	>60%
Landforms (glacial and other)	Eskers	eskers (from TRIM)	n/a	TRIM:	esker	1	buffer = 0-50 m
	Large Glacial	major meltwater channels (terracing)	n/a	digitized landforms	meltlarge	1	polygon
	Small Glacial	minor meltwater channels (ravines), all three classes	n/a	digitized landforms	meltsmall	1	buffer = 0-200 m
	Glacial Lakes	glacial lakes	n/a	digitized landforms	glacialake	1	polygon + buffer (0-100 m)
	Scarps	scarps and cliffs	n/a	TRIM:	cliffs	1	buffer = 0-100 m
	Waterfalls	falls and cascades (lines and polygons)	n/a	TRIM:	falls	1	buffer = 0-100 m
	Rapids	rapids (lines and polygons)	n/a	TRIM:	rapids	1	buffer = 0-100 m
	Lithic Zone	lithic procurement area based on quarries, bedrock, and drainage	n/a	digitized polygon	lithiczone	1	polygon

Table H1: Quesnel/Chilcotin Forest District AOA's Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
Ungulate	caribou core range	moderate and high caribou capability	n/a	MoE wildlife capability	ungulate	1	caribou polygon
	mule deer range	mule deer critical winter range	n/a	MoE critical winter range	ungulate	2	mule deer polygon
Forest Cover	old growth lodgepole	lodgepole pine stands of age class 8 or greater	PI 8+	forest cover	oldgrowth	1	PI 8+ polygon
	old growth cedar	cedar stands of age class 8 or greater	C 8+	forest cover	oldgrowth	2	C 8+ polygon
	whitebark pine	all stands with whitebark pine present (representing subalpine)	Pa	forest cover	whitebark	1	Pa polygon + buffer (0-300 m)
	open range	all open range polygons	OR	forest cover	openrange	1	openrange polygon + buffer (0-200 m)
Ecosection	BV	Bowron Valley		MoE ecosection	eco	1	BOV
	CB	Cariboo Basin				2	CAB
	CM	Cariboo Mountains				3	CM
	CAP	Cariboo Plateau				4	CAP
	CCR	Central Chilcotin Ranges				5	CCR
	CHP	Chilcotin Plateau				6	CHP
	FRB	Fraser River Basin				7	FRB
	NU	Nazko Upland				8	NAU
	NPR	Northern Pacific Ranges				9	NPR
	QH	Quesnel Highlands				10	QUH
	QL	Quesnel Lowlands				11	QUL
	WCR	Western Chilcotin Ranges				12	WCR
	WCU	Western Chilcotin Uplands				13	WCU

Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
Biogeo-climatic Zone	AT	Alpine Tundra		BGC zone	zone	1	AT
	BG	Bunchgrass				2	BG
	CWH	Coastal Western Hemlock				3	CWH
	IDF	Interior Douglas Fir				4	IDF
	ICH	Interior Cedar-Hemlock				5	ICH
	ESSF	Engelmann Spruce Subalpine Fir				6	ESSF
	MH	Mountain Hemlock				7	MH
	MS	Montane Spruce				8	MS
	SBPS	Sub-Boreal Pine-Spruce				9	SBPS
	SBS	Sub-Boreal Spruce				10	SBS
Biogeo-climatic subzone	AT p	Alpine Tundra		BGC zone	subzone	1	AT polygon
	BGxw2	Bunch Grass very dry warm, Alkali variant				2	BGxw2 polygon
	CWHds1	Coastal Western Hemlock dry submaritime, southern variant				3	CWHds1 polygon
	IDFxm	Interior Douglas fir very dry mild				4	IDFxm polygon
	IDFdk4	Interior Douglas fir dry cool, Chilcotin variant				5	IDFdk4 polygon
	IDFunc	Interior Douglas fir unclassified				6	IDFunc polygon
	ICHmk3	Interior Cedar-Hemlock moist cool				7	ICHmk3 polygon
	ICHwk2	Interior Cedar-Hemlock wet cool variant 2				8	ICHwk2 polygon
	ICHwk4	Interior Cedar-Hemlock wet cool variant 4				9	ICHwk4 polygon
	ESSFmv1	Engelmann Spruce-Subalpine Fir moist very cold variant 1				10	ESSFmv1 polygon

Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
	ESSFwc3	Englemann Spruce-Subalpine Fir wet cold Cariboo variant				11	ESSFwc3 polygon
	ESSFwk1	Englemann Spruce-Subalpine Fir wet cool Cariboo variant				12	ESSFwk1 polygon
	ESSFxv	Englemann Spruce-Subalpine Fir very dry very cold				13	ESSFxv polygon
	MHmm2	Mountain Hemlock moist maritime leeward variant				14	MHmm2 polygon
	MSxv	Montane Spruce very dry very cold				15	MSxv polygon
	MSunc	Montane Spruce unclassified				16	MSunc polygon
	SBPSdc	Sub-Boreal Pine Spruce dry cold				17	SBPSdc polygon
	SBPSmc	Sub-Boreal Pine Spruce moist cold				18	SBPSmc polygon
	SBPSmk	Sub-Boreal Pine Spruce moist cool				19	SBPSmk polygon
	SBPSxc	Sub-Boreal Pine Spruce very dry cold				20	SBPSxc polygon
	SBSdw1	Sub-Boreal Spruce dry warm Horsefly variant				21	SBSdw1
	SBSdw2	Sub-Boreal Spruce dry warm Blackwater variant				22	SBSdw2
	SBSmc2	Sub-Boreal Spruce moist cold Babine variant				23	SBSmc2
	SBSmh	Sub-Boreal Spruce moist hot				24	SBSmh
	SBSmw	Sub-Boreal Spruce moist warm				25	SBSmw
	SBSwk1	Sub-Boreal Spruce wet cool Willow variant				26	SBSwk1

Table H1: Quesnel/Chilcotin Forest District AOAs Feature Definitions, Sources, Codes, and Buffers

Feature Category	Feature Class	Definition	FP Code Equivalent	Source GIS Coverage	Feature Code	Buffer/ Polygon Code	Buffer/Polygon Criteria
Sites	Polygon sites	recorded archaeological sites >100 m in size	n/a	digitized sites	site	1	polygon + buffer (0-100 m)
						2	polygon + buffer (100-250 m)
	Point sites	recorded archaeological sites <100 m in size	n/a	digitized sites		1	buffer = 0-100 m
						2	buffer = 100-250 m
Trails	definite	level of route confidence=good	n/a	digitized trails	trailgood	1	buffer = 200 m
	probable	level of route confidence=moderate	n/a	digitized trails	trailmod	1	buffer = 200 m
	possible	level of route confidence=poor	n/a	digitized trails	trailpoor	1	buffer = 200 m?

Logical Statements

The logical (or modelling) statements are the core of the model of archaeological potential. These statements are the instructions used by the GIS to analyze the biophysical and cultural coverages used in the GIS model. The statements are written in *ARC Macro Language* (AML) which is the language that can be understood by the GIS used in this project (ARC INFO).

Each of the statements include a RESELECT command, references to feature classes and feature codes (i.e., streamsal=1), and a CALCULATE command for generating an archaeological potential value for a specific site type. What these statements mean is that the GIS has been instructed to identify (RESELECT) all areas where certain features are present (i.e., streamsal=1), and return a potential value (CALCULATE) for a specific site type (i.e., TYP2=2) at those locations. The logical statements are grouped by site type, and presented in order from the lowest potential statement to the highest potential statement for each site type.

For a definition and explanation of each feature class and feature code used in the logical statements, please refer to the **Feature Definitions Table** provided in this Appendix. For a definition of each site type, please refer to the **Traditional Activity Table** in Appendix B. For a generalized explanation of how the logical statements were constructed, please refer to **Volume 1: Final Report**. Please note that the logical statements are directly related to the information compiled in the Traditional Activities Table.

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```

/*****
/*** Logical Statements for the Chilcotin/Quesnel Archaeological Potential Model
/***   - Version 6.0: May, 1998
/*****/

/***
/*** TYP1: Fishing Station - salmon
/***
/* Print a marker to the screen to help with debugging
&TYPE "TYP1:"

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 and subzone <> 15 ) and streamsalm = 1
calculate TYP1 = 2

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 and subzone <> 15 ) and streamsalm = 1 and (
lakelarge = 1 or lakemed = 1 )
calculate TYP1 = 4

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 and subzone <> 15 ) and streamsalm = 1 and rapids =
1
calculate TYP1 = 4

/***
/*** TYP2: Cache - salmon
/*** TYP3: Base camp - salmon
/***
&TYPE "TYP2 & 3:"

SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 1 or streamsalm = 2 or streamsalm = 3 ) and ( streamfish = 1 or
streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or
lakemed = 2 or lakesmall = 1 or wetlarge = 1 )
calculate TYP2 = 2
calculate TYP3 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 )
and ( streamsalm = 1 or streamsalm = 2 or streamsalm = 3 or streamsalm = 4 )
calculate TYP2 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 )
and ( streamsalm = 3 or streamsalm = 4 ) and ( meltlarge = 1 or meltsmall = 1 )
calculate TYP2 = 3

SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 1 or streamsalm = 2 or streamsalm = 3 or streamsalm = 4 ) and (
streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2
or lakemed = 1 or lakemed = 2 or lakesmall = 1 or wetlarge = 1 or wetsmall = 1 )
calculate TYP2 = 3
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 1 or streamsalm = 2 ) and ( meltlarge = 1 )
calculate TYP2 = 3
calculate TYP3 = 3

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 3 )
calculate TYP2 = 3
calculate TYP3 = 3

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 1 or streamsalm = 2 )
calculate TYP2 = 4
calculate TYP3 = 4

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 ) and (
streamsalm = 1 or streamsalm = 2 or streamsalm = 3 ) and ( streamfish = 1 or
streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or
lakemed = 2 or lakesmall = 1 or wetlarge = 1 )
calculate TYP2 = 4
calculate TYP3 = 4

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 and zone <> 6 and subzone <> 15 )
and ( streamsalm = 1 or streamsalm = 2 ) and ( meltlarge = 1 )
calculate TYP2 = 4

/****
/**** TYP4: Fishing Station - trout, sucker
/**** TYP29: Kill/Butcher - beaver/muskrat/otter
/****
&type "TYP4:"
&TYPE "TYP4 & 29:"

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or streamfish = 1 )
calculate TYP4 = 2
calculate TYP29 = 2

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or streamfish = 1 ) and (
streamothr = 1 )
calculate TYP4 = 3
calculate TYP29 = 3

SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or streamfish = 1 ) and (
lakelarge = 1 or lakemed = 1 or lakesmall = 1 )
calculate TYP4 = 4
calculate TYP29 = 4
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 ) and ( streamfish = 1 )
calculate TYP4 = 4
calculate TYP29 = 4
```

```
/**
/** TYP5: Base Camp - trout, sucker, etc.
/** TYP6: Cache - trout, sucker, etc.
/**
&TYPE "TYP5 & 6:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 ) and ( lakelarge = 1 or
lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 )
calculate TYP5 = 2
calculate TYP6 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamfish = 1 or streamfish = 2 )
calculate TYP5 = 2
calculate TYP6 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 and zone <> 6 )
RESELECT ( streamsalm = 3 or streamfish = 3 ) or ( lakelarge = 3 or lakemed = 3 or
lakesmall = 2 )
calculate TYP6 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 and zone <> 6 ) and ( streamsalm =
1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 ) and ( lakelarge = 1 or
lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 )
calculate TYP6 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 ) and ( streamfish = 1 or streamfish = 2 or
streamfish = 3 ) and ( lakelarge = 3 or lakemed = 3 or lakesmall = 2 )
calculate TYP5 = 3
calculate TYP6 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 and zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 or streamfish = 1 or streamfish = 2 or streamfish = 3
) and ( lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1
)
calculate TYP5 = 4
calculate TYP6 = 4
```

```
/**
/** TYP7: Fishing station - kokanee
/**
&TYPE "TYP7:"
```

```
SELECT POTGRD_V6.VAT
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

Reselect (slope = 3 or slope = 4) and (lakelarge = 1 or lakemed = 1)
calculate TYP7 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1 or slope = 2) and (lakelarge = 1 or lakemed = 1)
calculate TYP7 = 3

/**/
/**/ TYP8: Base Camp - kokanee
/**/ TYP9: Cache - kokanee
/**/ /**/
&TYPE "TYP8: & 9"

SELECT POTGRD_V6.VAT
Reselect (slope = 1 or slope = 2) and (lakelarge = 1 or lakelarge = 2 or lakelarge
= 3 or lakemed = 1 or lakemed = 2 or lakemed = 3)
calculate TYP9 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (lakelarge = 3 or lakemed = 3)
calculate TYP8 = 3
calculate TYP9 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed
= 2)
calculate TYP8 = 4
calculate TYP9 = 4

/**/
/**/ TYP10: Fishing Station - whitefish
/**/ TYP11: Base Camp - whitefish
/**/ TYP12: Cache - whitefish
/**/ /**/
&TYPE "TYP10, 11 & 12:"

SELECT POTGRD_V6.VAT
Reselect (slope = 3) and (lakelarge = 1)
calculate TYP10 = 2
calculate TYP12 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1 or slope = 2) and (lakelarge = 1 or lakelarge = 2 or lakelarge
= 3)
calculate TYP12 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1 or slope = 2) and (lakelarge = 1)
calculate TYP10 = 3
calculate TYP12 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (lakelarge = 3)
calculate TYP11 = 3
calculate TYP12 = 3

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( lakelarge = 1 or lakelarge = 2 )
calculate TYP11 = 4
calculate TYP12 = 4
```

```
/** TYP13: Base Camp - hunting mule deer
/** TYP14: Kill/butcher - hunting mule deer
/** TYP15: Game Overlook - hunting mule deer
/** TYP39: Base Camp - balsamroot, nodding onion etc.
/**
&TYPE "TYP13 14 15 39:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( zone = 2 or zone = 4 or zone = 6 )
calculate TYP14 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 2 or zone = 4 ) and ( openrange = 1 )
calculate TYP14 = 2
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( ungulate = 2 )
calculate TYP14 = 2
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 4 or subzone = 21 or subzone = 22 ) and (
streamsalm = 3 or streamsalm = 4 or streamfish = 3 or streamfish = 4 or streamothr = 2
or lakelarge = 3 or lakelarge = 4 or lakemed = 3 or lakemed = 4 or lakesmall = 2 or
wetlarge = 2 ) and ( ungulate <> 2 )
calculate TYP14 = 2
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 3 or streamsalm = 4 or
streamfish = 3 or streamfish = 4 or streamothr = 2 or lakelarge = 3 or lakelarge = 4
or lakemed = 3 or lakemed = 4 or lakesmall = 2 or wetlarge = 2 ) and ( ungulate = 2 )
calculate TYP14 = 2
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 2 or zone = 4 or zone = 6 ) and ( esker = 1 or
meltsmall = 1 or glacialake = 1 or cliffs = 1 ) and ( ungulate <> 2 or whitebark <> 1
)
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( meltsmall = 1 ) and ( ungulate = 2 or whitebark = 1 )
calculate TYP15 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( esker = 1 or glacialake = 1 or cliffs = 1 ) and (
ungulate = 2 or whitebark = 1 )
calculate TYP15 = 3
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (streamsalm = 3 or streamfish = 3 or streamothr = 2 or lakelarge = 3 or lakemed = 3 or lakesmall = 2 or wetlarge = 2) and (ungulate = 2)
calculate TYP14 = 3
calculate TYP15 = 3

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (zone = 2 or zone = 4 or zone = 6) and (streamsalm = 3 or streamfish = 3 or streamothr = 2 or lakelarge = 3 or lakemed = 3 or lakesmall = 2 or lakevs = 2 or wetlarge = 2 or wetsmall = 1) and (openrange = 1)
calculate TYP14 = 3
calculate TYP15 = 3

SELECT POTGRD_V6.VAT

Reselect (slope = 2) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or wetlarge = 1) and (ungulate = 2)
calculate TYP13 = 3
calculate TYP14 = 3
calculate TYP15 = 3
calculate TYP39 = 3

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (zone = 4 or subzone = 21 or subzone = 22) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or wetlarge = 1) and (ungulate <> 2)
calculate TYP13 = 3
calculate TYP14 = 3
calculate TYP15 = 3
calculate TYP39 = 3

SELECT POTGRD_V6.VAT

Reselect (slope = 2) and (streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or wetlarge = 1) and (whitebark = 1)
calculate TYP13 = 3
calculate TYP14 = 3
calculate TYP15 = 3
calculate TYP39 = 3

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (zone = 2 or zone = 4 or zone = 6) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1)
Reselect (openrange = 1)
calculate TYP14 = 4
calculate TYP15 = 4

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or wetlarge = 1) and (ungulate = 2)
calculate TYP13 = 4
calculate TYP14 = 4

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
calculate TYP15 = 4
calculate TYP39 = 4
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( streamfish = 1 or streamfish = 2 or streamothr = 1 or
lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or wetlarge = 1 ) and (
whitebark = 1 )
calculate TYP13 = 4
calculate TYP14 = 4
calculate TYP15 = 4
calculate TYP39 = 4
```

```
/**
/** TYP16: Hunting blind - hunting mule deer
/**
&TYPE "TYP16:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamfish = 1 or streamfish = 2 or
streamfish = 3 or streamothr = 1 or streamothr = 2 ) and ( lakesmall = 1 or lakesmall
= 2 or lakevs = 1 ) and ( whitebark = 1 )
calculate TYP16 = 3
```

```
/**
/** TYP17: Base Camp - hunting caribou
/** TYP18: Hunting blind - hunting caribou
/** TYP19: Kill/butcher - hunting caribou
/** TYP20: Cache - hunting caribou
/** TYP27: Kill/butcher - hunting bears
/** TYP30: Kill/butcher - hunting snowshoe hares
/** TYP32: Kill/butcher - hunting grouse
/** TYP45: Processing - Plant gathering - tree lichen
/**
&TYPE "TYP17 18 19 20 27 30 32 45:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( zone = 1 or zone = 6 or zone = 8 )
calculate TYP19 = 1
calculate TYP27 = 1
calculate TYP30 = 1
calculate TYP32 = 1
calculate TYP45 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( ungulate = 1 )
calculate TYP18 = 2
calculate TYP19 = 2
calculate TYP20 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or
lakesmall = 1 or wetlarge = 1 ) and ( ungulate = 1 )
calculate TYP17 = 3
calculate TYP18 = 3
calculate TYP19 = 3
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

calculate TYP20 = 3

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 1 or subzone = 11 or subzone = 13 or subzone = 15
) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or
lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 or
wetlarge = 1 )
calculate TYP17 = 3
calculate TYP18 = 3
calculate TYP19 = 3
calculate TYP20 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( streamsalm = 3 or streamsalm = 4 or streamfish = 3 or
streamfish = 4 or streamothr = 1 or streamothr = 2 or lakelarge = 3 or lakelarge = 4
or lakemed = 3 or lakemed = 4 or lakesmall = 2 or wetlarge = 2 or wetsmall = 1 ) and (
ungulate = 1 )
calculate TYP18 = 3
calculate TYP19 = 3
calculate TYP20 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or
lakesmall = 1 or wetlarge = 1 ) and ( ungulate = 1 )
calculate TYP17 = 4
calculate TYP18 = 4
calculate TYP19 = 4
calculate TYP20 = 4
```

```
/**
/** TYP21: Base camp - hunting elk ( moose )
/** TYP22: Kill/butcher - hunting elk ( moose )
/** TYP23: Game overlook - hunting elk ( moose )
/** TYP27: Kill/butcher - hunting bears
/** TYP30: Kill/butcher - hunting snowshoe hares
/** TYP32: Kill/butcher - hunting grouse
/** TYP43: Processing - Plant gathering - saskatoons, soapberries, blueberries
/** TYP44: Processing - Plant gathering - kinnikinnick berries
/**
&TYPE "TYP21 22 23 27 30 32 43 44:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( zone = 4 or zone = 5 or zone = 9 or zone = 10 )
calculate TYP22 = 1
calculate TYP27 = 1
calculate TYP30 = 1
calculate TYP32 = 1
calculate TYP43 = 1
calculate TYP44 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 2 or zone = 4 or zone = 9 ) and ( openrange = 1 )
calculate TYP22 = 2
calculate TYP23 = 2
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
esker = 1 or meltsmall = 1 or glacialake = 1 or cliffs = 1 )
calculate TYP23 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone = 4 or zone = 5 or zone = 9 or zone =
10 ) and ( streamsalm = 3 or streamsalm = 4 or streamfish = 3 or streamfish = 4 OR
streamothr = 1 or streamothr = 2 or lakelarge = 3 or lakelarge = 4 or lakemed = 3 or
lakemed = 4 or lakesmall = 2 or wetlarge = 2 )
calculate TYP22 = 2
calculate TYP23 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
subzone <> 23 ) and ( streamothr = 1 or lakesmall = 2 or lakevs = 1 or wetlarge = 2 or
wetsmall = 1 )
calculate TYP22 = 2
calculate TYP23 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
subzone <> 23 )
RESELECT ( streamsalm = 3 or streamsalm = 4 or streamfish = 3 or streamfish = 4 or
streamothr = 2 or lakelarge = 3 or lakelarge = 4 or lakemed = 3 or lakemed = 4 ) and (
esker = 1 or meltsmall = 1 or glacialake = 1 or cliffs = 1 )
calculate TYP23 = 2

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
subzone <> 23 ) and ( streamothr = 1 or lakesmall = 2 or lakevs = 1 or wetlarge = 2 or
wetsmall = 1 )
calculate TYP22 = 3
calculate TYP23 = 3

SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
subzone <> 23 ) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish
= 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1
or wetlarge = 1 )
calculate TYP21 = 3
calculate TYP22 = 3
calculate TYP23 = 3

SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 4 or zone = 5 or zone = 9 or zone = 10 ) and (
subzone <> 23 ) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish
= 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1
or wetlarge = 1 )
calculate TYP21 = 4
calculate TYP22 = 4
calculate TYP23 = 4
```

/***

/*** TYP24a: Base Camp - hunting mountain sheep, goats

/*** TYP24b: Hunting blind - hunting mountain sheep, goats

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
/**/
/**/ TYP25: Kill/butcher - hunting mountain sheep, goats
/**/ TYP27: Kill/butcher - hunting bears
/**/ TYP25: Kill/butcher - hunting marmots
/**/
```

```
&TYPE "TYP24a 24b 25 27 28:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( zone = 1 or subzone = 11 or subzone = 13 )
calculate TYP25 = 1
calculate TYP28 = 1
calculate TYP27 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone = 1 or subzone = 11 or SUBZONE = 13 )
calculate TYP24b = 2
calculate TYP25 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect slope = 1 and ( zone = 1 or subzone = 11 or SUBZONE = 13 ) and ( streamsalm =
1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 ) and ( lakemed = 1 or lakemed
= 2 or lakesmall = 1 or lakevs = 1 )
calculate TYP24a = 3
calculate TYP24b = 3
calculate TYP25 = 3
```

```
/**/
/**/ TYP33: Base camp - hunting waterfowl
/**/ TYP34: Kill/butcher - hunting waterfowl
/**/ TYP35: Hunting blind - hunting waterfowl
/**/
&TYPE "TYP33 34 35:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed
= 2 or lakesmall = 1 or wetlarge = 1 )
calculate TYP34 = 2
calculate TYP35 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect slope = 1 and falls = 1
calculate TYP33 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed
= 2 or lakesmall = 1 or wetlarge = 1 )
calculate TYP33 = 3
calculate TYP34 = 3
calculate TYP35 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 1 or streamfish = 1 ) and falls
= 1
calculate TYP34 = 4
calculate TYP35 = 4
```

```
/**/
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
/** TYP36: Base camp - Plant gathering - spring beauty, avalanche lily
/** TYP37: Processing - Plant gathering - spring beauty, avalanche lily
/** TYP38: Cache - Plant gathering - spring beauty, avalanche lily
/** TYP42: Processing - Plant gathering - huckleberries
/** TYP46: Processing - Plant gathering - whitebark pine nuts
/** TYP47: Cache - Plant gathering - whitebark pine nuts
/**
&TYPE "TYP36 37 38 42 46 47:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( zone = 1 or zone = 6 )
calculate TYP37 = 1
calculate TYP38 = 1
calculate TYP42 = 1
calculate TYP46 = 1
calculate TYP47 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 3 ) and ( zone = 1 or zone = 6 ) and ( streamfish = 1 or streamfish
= 2 or streamfish = 3 or lakemed = 1 or lakemed = 2 or lakemed = 3 or lakesmall = 1 or
lakesmall = 2 or lakevs = 1 or wetlarge = 1 or wetlarge = 2 or wetsmall = 1 or
wetsmall = 2 ) and whitebark <> 1
calculate TYP37 = 2
calculate TYP38 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone = 1 or zone = 6 ) and ( streamsalm = 3
or streamfish = 2 or lakemed = 3 or lakesmall = 2 or lakevs = 1 or wetlarge = 2 or
wetsmall = 1 ) and whitebark <> 1
calculate TYP37 = 2
calculate TYP38 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 3 ) and ( streamfish = 1 or streamfish = 2 or streamfish = 3 or
lakemed = 1 or lakemed = 2 or lakemed = 3 or lakesmall = 1 or lakesmall = 2 or lakevs
= 1 or wetlarge = 1 or wetlarge = 2 or wetsmall = 1 or wetsmall = 2 ) and whitebark =
1
calculate TYP37 = 3
calculate TYP38 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( streamfish = 3 or lakemed = 3 or lakesmall = 2 or lakevs
= 1 or wetlarge = 2 or wetsmall = 2 ) and whitebark = 1
calculate TYP37 = 3
calculate TYP38 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect slope = 2 and ( streamfish = 1 or streamfish = 2 or lakemed = 1 or lakemed =
2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1 or wetsmall = 1 ) and whitebark = 1
calculate TYP36 = 3
calculate TYP37 = 3
calculate TYP38 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect slope = 1 and ( zone = 1 or zone = 6 ) and ( streamfish = 1 or streamfish = 2
) and ( lakemed = 1 or lakemed = 2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1 )
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

and whitebark <> 1

calculate TYP36 = 3

calculate TYP37 = 3

calculate TYP38 = 3

SELECT POTGRD_V6.VAT

Reselect slope = 1 and (streamfish = 1 or streamfish = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1 or wetsmall = 1) and whitebark = 1

calculate TYP36 = 4

calculate TYP37 = 4

calculate TYP38 = 4

/**

/** TYP39: Base Camp - balsamroot, nodding onion etc. - see mule deer

/**

/**

/** TYP40: Processing - Plant gathering - balsamroot , nodding onion etc.

/** TYP41: Cache - Plant gathering - balsamroot, nodding onion etc.

/**

&TYPE "TYP40 41:"

SELECT POTGRD_V6.VAT

Reselect (zone = 4)

calculate TYP40 = 1

calculate TYP41 = 1

SELECT POTGRD_V6.VAT

Reselect slope = 1 and zone = 4 and (streamsalm = 4 or streamfish = 4 or lakelarge = 4 or lakemed = 4)

calculate TYP40 = 2

calculate TYP41 = 2

SELECT POTGRD_V6.VAT

Reselect slope = 1 and zone = 4 and (streamsalm = 3 or streamfish = 3 or lakelarge = 3 or lakemed = 3 or lakesmall = 2 or wetlarge = 2 or wetsmall = 2)

calculate TYP40 = 3

calculate TYP41 = 3

SELECT POTGRD_V6.VAT

Reselect slope = 1 and zone = 4 and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or streamthr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1 or wetsmall = 1)

calculate TYP40 = 4

calculate TYP41 = 4

/**

/** TYP48: Culturally Modified tree - Plant gathering - lodgepole pine.

/** TYP49: Cooking - Plant gathering - lodgepole pine

/**

&TYPE "TYP48 49:"

SELECT POTGRD_V6.VAT

Reselect (zone = 8 or zone = 9 or zone = 10)

calculate TYP48 = 1

calculate TYP49 = 1

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 4 or streamfish = 4 or
lakelarge = 4 or lakemed = 4 ) and oldgrowth = 1
calculate TYP48 = 2
calculate TYP49 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect slope = 3 and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or
lakesmall = 1 or wetlarge = 1 ) and oldgrowth = 1
calculate TYP48 = 2
calculate TYP49 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 3 or streamfish = 3 or
lakelarge = 3 or lakemed = 3 or wetlarge = 2 ) and oldgrowth = 1
calculate TYP48 = 3
calculate TYP49 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( trailgood = 1 )
calculate TYP48 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 1 or streamsalm = 2 or
streamfish = 1 or streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or
lakemed = 2 or lakesmall = 1 or wetlarge = 1 ) and oldgrowth = 1
calculate TYP48 = 4
calculate TYP49 = 4
```

```
/**
/** TYP51: Culturally Modified tree - Plant gathering - cedar
/**
&TYPE "TYP51:"
SELECT POTGRD_V6.VAT
Reselect ( zone = 3 or zone = 5 or zone = 7 )
calculate TYP51 = 1
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 1 or streamsalm = 2 or
streamsalm = 3 or streamfish = 1 or streamfish = 2 or streamfish = 3 or lakelarge = 1
or lakelarge = 2 or lakelarge = 3 or lakemed = 1 or lakemed = 2 or lakemed = 3 or
wetlarge = 1 ) and oldgrowth = 2
calculate TYP51 = 3
```

```
/**
/** TYP52: Habitation - pithouse
/** TYP53: Habitation - rectangular plank house
/** TYP54: Habitation - base camp
/**
```

```
&TYPE "TYP52 53 54:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm =
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

1 or streamsalm = 2)
calculate TYP52 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (zone <> 1 AND zone <> 6) and (streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2)
calculate TYP52 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 2) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or
lakesmall = 1)
calculate TYP53 = 2
calculate TYP54 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (streamsalm = 3 or streamfish = 3 or lakelarge = 3 or
lakemed = 3 or lakesmall = 1)
calculate TYP53 = 2
calculate TYP54 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 2) and (streamfish = 3 or streamfish = 4) and (meltlarge = 1)
calculate TYP53 = 2
calculate TYP54 = 2

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or lakemed = 2 or
lakesmall = 2 or lakevs = 1)
calculate TYP53 = 3
calculate TYP54 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (streamfish = 3 or streamfish = 4 or lakelarge = 3 or
lakemed = 3 or lakesmall = 2) and (meltlarge = 1)
calculate TYP53 = 3
calculate TYP54 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 2) and (streamfish = 1 or streamfish = 2) and (meltlarge = 1)
calculate TYP53 = 3
calculate TYP54 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (streamfish = 3) and (streamothr = 1 or streamothr = 2
or wetlarge = 1 or wetlarge = 2 or wetsmall = 1 or wetsmall = 2 or openrange = 1)
calculate TYP53 = 3
calculate TYP54 = 3

SELECT POTGRD_V6.VAT
Reselect (slope = 1) and (zone <> 1 AND zone <> 6) and (streamfish = 1 or
streamfish = 3 or streamfish = 4) and (lakelarge = 3 or lakelarge = 4 or lakemed = 3
or lakemed = 4)
calculate TYP52 = 3

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 2 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 ) and ( meltlarge = 1 )
calculate TYP52 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 2 or zone = 4 or zone = 9 or zone = 10 ) and (
streamfish = 1 or streamfish = 2 or streamfish = 3 ) and ( meltlarge = 1 )
calculate TYP52 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 or streamsalm = 4 ) and ( streamfish = 3 or
streamfish = 4 or streamothr = 2 or lakelarge = 3 or lakelarge = 4 or lakemed = 3 or
lakemed = 4 or lakesmall = 2 or wetlarge = 2 or wetsmall = 2 )
calculate TYP52 = 3
calculate TYP53 = 3
calculate TYP54 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm = 4 ) and (
meltlarge = 1 )
calculate TYP52 = 3
calculate TYP53 = 3
calculate TYP54 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone = 2 or zone = 4 or zone = 9 or zone = 10 ) and (
streamfish = 1 or streamfish = 2 ) and ( streamothr = 1 or streamothr = 2 or wetlarge
= 1 or wetlarge = 2 or openrange = 1 )
calculate TYP52 = 4
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 or lakelarge = 1 or lakelarge = 2 or lakelarge = 3 or
lakemed = 1 or lakemed = 2 or lakemed = 3 ) and ( meltlarge = 1 )
calculate TYP52 = 4
calculate TYP53 = 4
calculate TYP54 = 4
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 AND zone <> 6 ) and ( streamfish = 1 or
streamfish = 2 or streamfish = 3 or streamfish = 4 ) and ( lakelarge = 1 or lakelarge
= 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 )
calculate TYP52 = 4
calculate TYP53 = 4
calculate TYP54 = 4
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( zone <> 1 AND zone <> 6 ) and ( streamsalm = 1 or
streamsalm = 2 or streamsalm = 3 or streamsalm = 4 )
Reselect ( streamfish = 1 or streamfish = 2 or streamothr = 1 or lakelarge = 1 or
lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1 or wetlarge = 1 or
wetsmall = 1 )
calculate TYP52 = 4
calculate TYP53 = 4
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

calculate TYP54 = 4

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (streamfish = 1 or streamfish = 2 or lakelarge = 1 or
lakelarge = 2 or lakemed = 1 or lakemed = 2 or lakesmall = 1) and (meltlarge = 1)

calculate TYP53 = 4

calculate TYP54 = 4

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (zone <> 1 AND zone <> 5 AND zone <> 6 AND zone <> 8) and
(streamfish = 1 or lakelarge = 1 or lakemed = 1 or lakesmall = 1)

calculate TYP53 = 4

calculate TYP54 = 4

SELECT POTGRD_V6.VAT

Reselect (slope = 1) and (zone <> 1 AND zone <> 6) and (streamfish = 1 or
streamfish = 2) and (streamothr = 1 or streamothr = 2 or wetlarge = 1 or wetlarge =
2 or wetsmall = 1 or openrange = 1)

calculate TYP53 = 4

calculate TYP54 = 4

/**

/** TYP55: Habitation - rock shelter

/**

&TYPE "TYP55:"

SELECT POTGRD_V6.VAT

Reselect (cliffs = 1)

calculate TYP55 = 2

SELECT POTGRD_V6.VAT

Reselect (streamsalm = 1 or streamsalm = 2 or streamsalm = 3 or streamfish = 1 or
streamfish = 2 or streamfish = 3 or lakelarge = 1 or lakelarge = 2 or lakelarge = 3 or
lakemed = 1 or lakemed = 2 or lakemed = 3) and (cliffs = 1)

calculate TYP55 = 3

/**

/** TYP56: Trails - also see mapped trail coverage

/**

&TYPE "TYP56:"

SELECT POTGRD_V6.VAT

Reselect (streamfish = 1)

calculate TYP56 = 3

/**

/** TYP57: Transit Camp

/**

&TYPE "TYP57:"

SELECT POTGRD_V6.VAT

Reselect (slope = 2) and (streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakemed = 1 or lakemed = 2 or
lakesmall = 1 or lakevs = 1 or wetlarge = 1 or wetsmall = 1) and (trailgood = 1)

calculate TYP57 = 3

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) AND ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
streamfish = 2 or streamothr = 1 or lakelarge = 1 or lakelarge = 2 or lakemed = 1 or
lakemed = 2 or lakesmall = 1 or lakevs = 1 or wetlarge = 1 or wetsmall = 1 ) and (
trailgood = 1 )
calculate TYP57 = 4
```

```
/**
/** TYP58: Rock Quarrying - Quarry
/**
&TYPE "TYP58:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( cliffs = 1 )
calculate TYP58 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or streamfish = 2 or
streamothr = 1 ) and ( lithiczone = 1 )
calculate TYP58 = 3
```

```
Reselect ( cliffs = 1 ) and ( lithiczone = 1 )
calculate TYP58 = 3
```

```
/**
/** TYP59: Rock Quarrying - lithic workshop
/**
&TYPE "TYP59:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 or slope = 3 ) and ( streamsalm = 4 or streamfish =
4 ) and ( lithiczone = 1 )
calculate TYP59 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( lithiczone = 1 )
calculate TYP59 = 2
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 3 or streamfish = 3 or
streamothr = 2 ) and ( lithiczone = 1 )
calculate TYP59 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( streamsalm = 1 or streamsalm = 2 or
streamfish = 1 or streamfish = 2 or streamfish = 2 or streamothr = 1 ) and (
lithiczone = 1 )
calculate TYP59 = 4
```

```
/**
/** TYP60: Rock Quarrying - Base camp
/**
&TYPE "TYP60:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 ) and ( streamsalm = 1 or streamsalm = 2 or streamfish = 1 or
```

File: A:\CHQU_Logical_Statements.txt 9/28/98, 1:57:00PM

```
streamfish = 2 or streamothr = 1 ) and ( lithiczone = 1 )
calculate TYP60 = 4
```

```
/**
/** TYP61: Ceremonial - Rock art
/**
&TYPE "TYP61:"
```

```
SELECT POTGRD_V6.VAT
Reselect ( streamsalm = 1 or streamsalm = 2 or streamsalm = 3 or streamsalm = 4 or
streamfish = 1 or streamfish = 2 or streamfish = 2 or streamfish = 4 or lakelarge = 1
or lakelarge = 2 or lakelarge = 3 or lakelarge = 4 or lakemed = 1 or lakemed = 2 or
lakemed = 3 or lakemed = 4 ) and ( cliffs = 1 )
calculate TYP61 = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( streamsalm = 1 or streamsalm = 2 ) and ( oldgrowth = 1 )
calculate TYP61 = 3
```

```
/**
/** TYP62: Ceremonial - tree carving - see CMTs (TYP48)
/** TYP63: Ceremonial - transformer stone - not modelled
/** TYP64: Ceremonial - sweats - modelled by villages, base camps
/** (TYP52, 53)
/** TYP65: Mortuary Practices - burials - modelled by villages, salmon fishing
/** (TYP52, 53, 1, 2, 3)
/** TYP66: Mortuary Practices - cremation - modelled by villages, salmon fishing
/** (TYP52, 53, 1, 2, 3)
/** TYP67: Warfare - defense - modelled by villages, trails (TYP52, 53, 56)
/**
&TYPE "TYP62 63 64 65 66 67:"
```

```
/**
/** SITPOT: recorded sites
/** TRAPOT: known trails
/**
```

```
SELECT POTGRD_V6.VAT
Reselect ( slope = 1 or slope = 2 ) and ( sitepnt = 2 or siteply = 2 )
calculate SITPOT = 3
```

```
SELECT POTGRD_V6.VAT
Reselect ( sitepnt = 1 or siteply = 1 )
calculate SITPOT = 4
```

```
SELECT POTGRD_V6.VAT
Reselect ( trailmod = 1 or trailpoor = 1 )
calculate TRAPOT = 2
```

```
SELECT POTGRD_V6.VAT
Reselect trailgood = 1
calculate TRAPOT = 3
```

```
/**
```

APPENDIX I: Archaeological Inventory Analysis

Introduction

The primary goal of the archaeological inventory analysis was to identify significant gaps in the amount of archaeological survey coverage within the CFD, with an emphasis on forestry-related AIAs and systematic research inventory projects. The objectives of this analysis were: (1) to determine the extent of archaeological inventory coverage within various divisions of the CFD, (2) to identify areas within the CFD where archaeological data is currently limited or inadequate for accurate GIS-modelling of archaeological potential, and (3) to recommend specific priority areas for future archaeological inventory studies which will help to alleviate the most significant data gaps.

This analysis is intended to revise the archaeological data gap analysis of the CFD recently prepared for the Archaeology Branch by Equinox Research and Consulting Ltd. (Equinox 1997). A number of problems and limitations are apparent in the data gap analysis conducted by Equinox. These include that: (1) an incomplete review of prior research studies and forestry permit reports was conducted, (2) non-CFD permit reports and inventories were included in the analysis, (3) there was a lack of methodological clarity in terms of the formulation of the extent and intensity of survey coverage, (4) inappropriate biophysical variables were utilized in the analysis of the inventory distribution, and (5) an incorrect assessment of inventory coverage by biogeoclimatic zones was conducted. These limitations are explained in greater detail below.

The Equinox data gap analysis report indicated that all archaeological inventory and impact assessment studies on file with the Culture Library at the Ministry of Small Business, Tourism, and Culture were obtained and reviewed, including all available interim and final reports for permits issued from 1994 through 1996. In addition, the report stated that maps and/or interim reports were requested from all permit holders with ongoing or incomplete permits. However, it appears that a number of significant studies were omitted or not used, including several of the most important systematic research inventories in the CFD (e.g., Alexander and Matson 1987; Alexander et al. 1985; Blacklaws et al. 1983; Eldridge and Eldridge 1980; Matson et al. 1980; Matson and Magne 1984). Many other small-scale surveys or AIAs were also omitted (e.g., Apland 1977; Bussey 1983, 1991; Tyhurst 1995). Also, the interim or final reports for six substantial forestry-related AIAs in 1995 and 1996 were completely omitted (e.g., the reports for permits 1995-207, 1995-224, 1995-270, 1996-034, 1996-234, and 1996-260), and the review of interim reports for five permits issued in 1996 was incomplete (e.g., the review omitted data pertaining to permits 1996-067, 1996-107, 1996-117, 1996-119, and 1996-148).

Although some of these reports may have been omitted because they were unavailable at the time of the study, or due to their "lack of clarity regarding actual survey area or survey intensity" (Equinox 1997:1), the reasons for omitting specific reports are not clearly stated in the data gap analysis report. The data gap study also lists many permit reports which were not utilized in the analysis, but the reasons for their exclusion is unclear. In addition, one non-permit report and three permit reports (for permits 1972-018, 1994-037, and 1995-137) were included in the review even though the archaeological fieldwork was conducted in the Williams Lake Forest District. The omission of numerous reports and the inclusion of non-CFD studies in the analysis suggests that the data gaps identified in the Equinox report and the recommended inventory priorities are not accurate or reliable.

One of the more problematic aspects of the Equinox data gap analysis report is the lack of information as to the methodology used to determine the extent and intensity of survey coverage in each permit project. In particular, it is not clear how the total number of hectares surveyed in the forestry-related AIAs was determined. In forestry archaeology projects, the actual extent of survey coverage in each cutblock varies dramatically, with some cutblocks receiving complete, systematic coverage, and other cutblocks receiving only very limited, judgemental coverage (see Appendix C). Likewise, the intensity of survey coverage within these projects also varies widely, with substantial differences in traverse and subsurface testing intervals occurring from project to project. In many cases, subsurface testing was not used at all. As such, simply using a sum of the total block areas to determine the extent of survey coverage will yield highly unreliable results. To minimize this problem, it is necessary to use a consistent formula for determining approximate survey coverage and/or intensity in each cutblock in each project. A possible formula for determining approximate inventory coverage was proposed in Appendix C of this report, but a comparable system was not described in the Equinox study. The formula proposed in Appendix C requires complete and accurate information on the area of each surveyed cutblock. Unfortunately, neither the Equinox study nor this report had access to reliable cutblock area data. Although use of the GIS data will eventually resolve this issue, it is not currently possible to obtain reliable inventory coverage data for forestry-related AIAs.

Overall, the results and recommendations of the Equinox data gap analysis are questionable, due to the significant omissions and limitations identified previously. However, a number of the variables used in the analysis appear to be both valid and appropriate. The Equinox data gap analysis assessed inventory coverage in relation to four biophysical variables: (1) biogeoclimatic zones, (2) distance from major drainage, (3) elevation, and (4) latitude. Biogeoclimatic zones represent an appropriate biophysical variable in a data gap analysis of inventory coverage as they reflect generalized but tangible differences in vegetation, climate, and physiography which undoubtedly have a relationship with archaeological site distribution and density. Given the emphasis on biogeoclimatic zones in the recommendations of the Equinox report, it appears that this variable was considered the most significant variable in the data gap analysis. However, the Equinox analysis excluded one (the Coastal Western Hemlock zone) of the eight zones in the CFD. Moreover, the analysis did not use biogeoclimatic subzones, which allow for a much finer scale of identification of biophysical characteristics.

Another of the variables utilized in the Equinox data gap analysis, distance to major drainages, also appears to represent a valid and appropriate variable for assessing data gaps in inventory coverage for the reasons noted in the Equinox (1997:2) report. However, while the Equinox report indicates that survey coverage within four kilometres of major drainages is over-represented, this conclusion appears to be somewhat suspect as although it is true that most research inventories have tended to focus on major drainages, very few research inventories have, to date, been conducted in the CFD. Many of the significant drainages in the CFD, including those of the Chilcotin, Homathko/Mosley, Nazko, and Taseko Rivers, have never been the subject of adequate systematic research inventories. Moreover, while many non-forestry impact assessments are biased towards survey in the immediate vicinity of major drainages, most forestry-related AIAs are biased towards survey away from these drainages. In other words, while a data gap analysis should consider the relationship of survey coverage in relation to major drainages, it should also consider survey coverage in relation to other types of aquatic features as well. Perhaps a more appropriate approach for a data gap analysis would be to conduct a review of the number of representative, complete, or systematic inventories of watersheds, in which streams and waterbodies of all sizes, *including* major drainages, are adequately considered.

Elevation is a relatively arbitrary biophysical division for determining inventory gaps, as the relationship of this variable to archaeological site distribution and density can be greatly affected by other variables such as climate, aspect, latitude, and topography. For example, the same elevation on opposite sides of a mountain range may have dramatically different relationships to archaeological potential. However, elevation represents one of the many variables incorporated into biogeoclimatic zones, where the relationship of other variables is accounted for in the zone characteristics. Likewise, latitude represents a largely arbitrary division which is not particularly useful for an inventory data gap analysis. Although latitude may reflect broad differences in climate conditions (Equinox 1997:3), climate is much more accurately reflected by biogeoclimatic zones as well as by ecosections. It should be noted that the data gap analysis conducted by Equinox did not consider inventory coverage by ecosections, which represent zones with relatively homogenous physiographic characteristics, including topography, geology, geomorphology, and climate.

Lastly, the omission of numerous significant inventory reports in the Equinox data gap analysis has resulted in a substantial miscalculation of the total area surveyed in each biogeoclimatic zone (see Appendix F for the abbreviations used to designate biogeoclimatic zones). The data gap analysis indicated that as of 1996, archaeological inventory coverage was restricted to the SBPS and IDF biogeoclimatic zones in the CFD (with these areas representing 51% and 49% of the total surveyed area in the CFD, respectively), and that no survey coverage had taken place in any of the remaining six zones. In particular, the data gap analysis noted the significant absence of archaeological inventory information for the AT, ESSF, and MS zones. However, this assessment is inaccurate. Although the exact numbers of hectares surveyed in each zone by each project is unavailable, it is clear that significant survey has taken place in the AT, ESSF, and MS zones (see Appendix C). As of 1996, three judgemental and three major systematic research inventories included surveys which extended into the MS zone, while two research inventories included portions of the AT zone, and three included portions of the ESSF zone. In addition, of the 25 forestry-related AIAs conducted through 1996, 14 of these projects included surveys that took place in the MS zone (totalling several thousand hectares), while two had included limited surveys in the ESSF zone. Although the AT and ESSF zones may be under-represented, the MS zone is well-represented, and inventory data is not absent from all three zones as stated in the Equinox report. Nonetheless, no inventory data is available from the BG, CWH, and MH zones in the CFD, although these zones are certainly well-represented by inventories in adjacent forest districts. A more detailed review of archaeological inventories by biogeoclimatic zones is presented in the following section.

Archaeological Inventory Analysis

As described above, biogeoclimatic subzones, ecosections, and watersheds appear to be the most important biophysical variables for assessing data gaps in archaeological inventory coverage. In addition to these biophysical variables, inventory distribution within the traditional territories of each resident aboriginal community should be considered. In the following archaeological inventory analysis, survey coverage for each of these variables is reviewed. Data gaps in inventory coverage are considered to exist when a representative area (or sample) of each variable has not been surveyed. The most accurate method for determining relative data gaps in inventory coverage involves calculating the total hectares surveyed to date within each variable.

All types of inventory projects (judgemental research and systematic research inventories, and development and forestry-related AIAs) can contribute valuable information for modelling archaeological potential, and the area surveyed by each type of project should be included in an overall assessment of inventory coverage. The Equinox (1997) data gap analysis recommended that

1% of the total area of each biogeoclimatic zone in the CFD should be inventoried (by all types of projects) in order to provide a minimum sample size for developing models of archaeological potential. A long-term goal should be the inventory of 1% of the total area of all variables, not just biogeoclimatic zones. Achieving this goal would require inventory of approximately 30,000 ha throughout the CFD. Although total survey coverage may already exceed this figure, the current coverage does not reach the 1% plateau for most variables. Unfortunately, reliable data on the total area surveyed in most judgemental, development, and forestry-related AIA projects is currently unavailable, making it impossible to accurately assess the data gaps in achieving the goal of 1% survey coverage of each variable. Accurate data on the number of hectares surveyed in each zone is only available for systematic research inventories, which only represent a small proportion of the total area inventoried.

From a forestry management perspective, survey coverage in forestry-related AIAs is an important source of inventory data, and this importance is amplified by the fact that the total area surveyed in forestry-related AIAs vastly exceeds that of other types of projects. However, from a purely research point of view, systematic research inventories provide the most reliable and representative results. Although achieving the long-term goal of 1% survey coverage for each variable is important, the more immediate short-term goal in addressing data gaps should be to ensure that the total area surveyed in systematic research inventories for each variable is proportional to the total area in the CFD. In other words, since the SBPSxc subzone represents 33.4% of the total area of the CFD, approximately 33% of the total area surveyed in systematic research inventory studies should occur in this zone.

A realistic short-term goal for research inventories would be survey coverage of 0.2% of the entire CFD, or approximately 5000 ha in total. To date, 2372 ha have been surveyed in systematic research inventories (see Appendix C), representing nearly 50% of the short-term goal. Future systematic research inventories should be designed to address data gaps in the inventory coverage for each of the variables. The results of these studies in combination with better forestry AIA data will contribute to the minimum sample size required to develop and test accurate models of archaeological potential. The following sections detail the current survey coverage for each variable, identify data gaps, and recommend immediate priorities for further research.

Survey Coverage by Biogeoclimatic Subzones

As pointed out above, reliable data on the total area surveyed by all types of projects in each biogeoclimatic zone and subzone is unavailable. However, it is important to note that extensive survey has occurred in most forested biogeoclimatic zones and subzones, contrary to the findings in the Equinox (1997) report. The relative degree of survey within each subzone can be demonstrated by calculating the total number of projects that included a portion of each subzone, and comparing the relative percentage of the projects that encompassed a portion of each subzone against the relative area of each subzone. This comparison does not take into account differences in the extent and intensity of survey for each project (e.g., development AIAs generally involve intensive survey of a single small area while forestry-related AIAs involve judgemental survey of numerous large areas), and cannot be considered to be statistically reliable. Nonetheless, it does give a relative indication of the amount of archaeological data available for each subzone.

Table I1 lists the number of each type of archaeological project that included a surveyed portion of each subzone, the total number of projects that included a surveyed portion in each subzone, the relative percentage of projects that included a portion of each subzone, and the relative size of each subzone (using all data available as of December 1997; see Appendix C). This

information indicates that no archaeological projects in the CFD have incorporated survey in the BGxw2, CWHds1, MHmm2, and SBPSmk subzones. These subzones are relatively small and in total account for less than 2.5% of the entire forest district. While a number of projects have taken place in the ATp, this zone is under-represented relative to its size. The SBPSdc and ESSFvx subzones are represented proportionate to their area or slightly over-represented. All of the remaining subzones are over-represented.

Table I1: Archaeological Projects Conducted in Each Biogeoclimatic Subzone							
Subzone	% Area	Judgemental	Systematic	Development	Forestry	Projects	% Projects
ATp	17.2	1	1	0	0	2	4.3
BGxw2	<0.1	0	0	0	0	0	0
CWHds1	0.8	0	0	0	0	0	0
ESSFvx	9.6	1	2	0	2	5	10.6
IDFdk4	10.2	4	3	10	7	24	51.1
IDFunc	3.6	0	1	3	0	4	8.5
IDFxm	2.1	0	0	0	5	5	10.6
MHmm2	0.4	0	0	0	0	0	0
MSunc	2.8	0	2	0	0	2	4.3
MSxv	16.3	3	1	0	14	18	38.3
SBPSdc	2.2	0	0	0	1	1	2.1
SBPSmc	1.4	3	1	0	3	7	14.9
SBPSmk	<0.1	0	0	0	0	0	0
SBPSxc	33.4	5	4	9	18	36	76.6
TOTAL	100						

Comparing the number of projects conducted in each subzone is a relatively simplistic and inaccurate method for determining data gaps in inventory coverage. However, this analysis does indicate that a number of surveys have taken place in most of the forested zones present in the CFD. This is useful information for setting future research priorities. When accurate data on survey coverage becomes available, it will be possible to provide a more accurate assessment of the total relative amount of survey coverage by biogeoclimatic subzone. At present, reliable data detailing the total area surveyed in each biogeoclimatic subzone are only available for systematic inventory projects. Fortunately, of the four types of archaeological projects, systematic research inventories yield the most statistically reliable data on overall site distribution and density. For this reason, assessing the relative amount of systematic survey coverage provides the most useful data for identifying future research inventory priorities in biogeoclimatic zones.

Table I2 shows the total number of hectares surveyed in each of the systematic research inventories within each biogeoclimatic subzone. The table indicates that no systematic inventories have been conducted in the BGxw2, CWHds1, IDfxm, MHmm2, SBPSdc, and SBPSmk subzones, although only the IDfxm and SBPSdc subzones cover more than 1% of the CFD. In addition, the ATp, ESSFxv, and MSxv subzones are under-represented by systematic surveys. The survey coverage of the SBPSxc subzone is proportional to its area, while the remaining subzones (the IDfdk4, IDFunc, MSunc, and SBPSmc subzones) are currently over-represented by systematic surveys. The data presented in Table I2 is relatively similar to that in Table I1; only the relative percentage values for the MSunc, MSxv, IDFunc, and IDfxm differ substantially.

Table I2: Systematic Inventory Coverage by Biogeoclimatic Subzones										
Biogeo-climatic Subzone	% Area of CFD	Project							Total Area (ha)	% of Total Surveyed
		Dean	Eagle 79	Hom-athko	Eagle 83	Taseko	Potato	Chilko		
ATp	17.2	0	0	0	0	0	144	0	144	6.1
BGxw2	<0.1	0	0	0	0	0	0	0	0	0
CWHds1 CWHunc	0.8	0	0	0	0	0	0	0	0	0
ESSFxv	9.6	0	0	0	0	25	144	0	169	7.1
IDfdk4	10.2	0	192	0	96	0	0	100	388	16.4
IDFunc	3.6	0	0	192	0	0	0	0	192	8.1
IDfxm	2.1	0	0	0	0	0	0	0	0	0
MHmm2	0.4	0	0	0	0	0	0	0	0	0
MSunc	2.8	0	0	0	0	250	0	0	250	10.5
MSxv	16.3	0	64	0	0	0	0	50	114	4.8
SBPSdc	2.2	0	0	0	0	0	0	0	0	0
SBPSmc	1.4	325	0	0	0	0	0	0	325	13.7
SBPSmk	<0.1	0	0	0	0	0	0	0	0	0
SBPSxc	33.4	450	224	0	16	0	0	100	790	33.3
	100.2	775	480	192	112	275	288	250	2372	100

From a strict research point of view, all biogeoclimatic subzones should be considered equal when setting research priorities. From a forestry management perspective, however, it may be desirable for future research inventories to focus on major forested biogeoclimatic subzones. To set overall priorities for future inventories, it may be most appropriate to take into consideration forested subzones under-represented by systematic inventories, forested subzones under-represented by

forestry AIAs, non-forested subzones under-represented by systematic inventories, and the overall size of the subzone. On this basis, the following biogeoclimatic subzones are listed in order of overall priority for future inventories: SBPSdc, ESSFxv, SBPSxc, CWHds1, IDfxm, MHmm2, MSxv, SBPSmk, IDFunc, MSunc, BGxw2, ATp, IDFdk4, SBPSmc.

Survey Coverage by Ecosession

Similar to biogeoclimatic subzones, the most appropriate project types for assessing data gaps in the survey coverage of ecosessions are systematic research inventories. Accurate data on the area surveyed during forestry-related AIAs in each ecosession in the CFD is not available. However, from a review of forestry-related AIA reports it appears that no forestry AIAs have been conducted in the Fraser River Basin (FRB) and Northern Pacific Ranges (NPR) ecosessions within the CFD, while very limited forestry-related AIAs have been conducted in the Western Chilcotin Ranges (WCR) and Central Chilcotin Ranges (CCR) ecosessions. The majority of forestry-related AIAs conducted in the CFD have taken place in the Chilcotin Plateau (CP), Western Chilcotin Uplands (WCU), and Nazko Uplands (NU) ecosessions, with the relative frequency of these AIAs in each ecosession being approximately proportionate to the relative size of the ecosession area within the CFD. The lack of forestry-related AIAs in the FRB and NPR ecosessions is probably due to the limited number of forestry developments in these ecosessions.

Table I3: Systematic Inventory Coverage by Ecosession										
Ecosession	% Area of CFD	Project							Total Area (ha)	% of Total Surveyed
		Dean	Eagle 79	Hom-athko	Eagle 83	Taseko	Potato	Chilko		
FRB	1	0	0	0	0	0	0	0	0	0
CP	35	0	400	0	112	0	0	250	762	32.1
WCU	20	625	0	0	0	0	0	0	625	26.3
NU	7	150	0	0	0	0	0	0	150	6.3
CCR	20	0	80	192	0	275	288	0	835	35.2
WCR	10	0	0	0	0	0	0	0	0	0
NPR	7	0	0	0	0	0	0	0	0	0
TOTAL	100	775	480	192	112	275	288	250	2372	100

Data on the area surveyed during systematic research inventories in each ecosession and the total hectares surveyed in each ecosession is indicated in Table I3. The information in Table I3 was obtained by using the maps included in each report in order to determine the ecosession that each survey unit is located in. Currently, no systematic inventories have taken place in the FRB, WCR, and NPR ecosessions. By comparing the proportion of the total area surveyed in each ecosession to the proportion of each ecosession in the CFD, the data indicates that systematic inventories are slightly under-represented in the CP and NU ecosessions, and over-represented in the WCU and

CCR ecosections. Given this distribution of existing studies, the greatest research needs for future inventories, in order of priority, would be within the WCR, NPR, NU, CP, and FRB ecosections.

From a forestry management perspective, there is only limited need for research in the FRB and NPR ecosections, as forestry developments are limited in these regions. On this basis, the overall order of priority for future systematic inventories would be within the following ecosections: WCR, NU, CP, FRB, NPR, WCU, CCR. Again, the short-term goal should be to ensure that the proportion of systematic research survey in each of these ecosections is proportional to the area of each ecosection. Likewise, a long-term goal would be to ensure that 1% of the total area of each ecosection is surveyed by all types of projects.

Survey Coverage by Watershed

Six major watersheds drain the CFD including: the Atnarko, Chilcotin (including the Chilanko, Chilko, and Taseko Rivers), Dean, Nazko, Homathko, and Klinaklini Rivers. Within the CFD, four systematic research inventories have been conducted within the Chilko River watershed (Alexander and Matson 1987; Arcas 1998a; Magne and Matson 1984; Matson et al. 1980), while one inventory has been conducted in each of the Dean (Eldridge and Eldridge 1980), Homathko (Blacklaws et al. 1983), and Taseko River (Magne 1984) watersheds. Each of these inventories surveyed only a very small portion of the major watershed they were located in. To date, no archaeological inventories in the CFD have been completed with the specific intention of surveying a representative sample of an entire watershed. Although most systematic inventories were restricted to a single major watershed, representative survey units were not distributed throughout the watershed. For example, the total area surveyed in the Dean River study (Eldridge and Eldridge 1980) was relatively small, with higher elevations, forested environments away from major aquatic features, and small aquatic features being under-represented. Completion of the proposed Phase 2 of the Chilko River AIS (Arcas 1998a) would arguably provide a representative survey sample of the entire Bidwell Creek drainage (including a reach of the Chilko River), but the results will not be representative of the Chilko River watershed as a whole. Given the lack of watershed inventories, research designs for future inventories should focus on this type of survey.

Priority for future inventories should be given to small and intermediate-sized watersheds located within major watersheds where inventories have not been conducted in the past. In particular, inventories should focus on small watersheds within the Atnarko, Chilcotin/Chilanko (exclusive of the Chilko and Taseko watersheds), Nazko, and Klinaklini drainages, followed by (in descending order) the Dean, Homathko, and Taseko watersheds. Ideally, watershed study areas selected for systematic inventories should encompass the entire drainage of an intermediate-sized (fish-bearing) stream (including all its tributaries) which drains into a large (fish- or salmon-bearing) stream. Preference should be given to watersheds which also contain a variety of waterbodies (i.e., lakes, wetlands, etc.). These guidelines will ensure that all classes of streams and most classes of waterbodies are included within the study area, while at the same time, still keeping the study area to a manageable size. Research inventories within such a study area should consist of the systematic survey of quadrats randomly selected from throughout the watershed. A total survey area equalling at least 1% of the total watershed is recommended. Proportional distribution of the quadrats among biogeoclimatic and ecosections within the watershed is also recommended. Examples of some smaller and intermediate-sized watersheds, and their corresponding major drainage, which might be appropriate for systematic inventory include: Alexis Creek (Chilcotin), Anahim Creek (Chilcotin), Aneko River (Nazko), Beece Creek (Taseko), Corkscrew Creek (Dean), Haines Creek (Chilcotin), Hotnarko (Atnarko), McClinchy Creek (Klinaklini), Minton Creek (Chilcotin), Moore Creek (Chilcotin), Mosley Creek (Homathko), Palmer Creek (Chilcotin), Punkutlaenkut Creek (Chilcotin),

Puntzi Creek (Chilcotin), Ross Creek (Nazko), Tatla Lake Creek (Chilanko), Tautri River (Nazko), Tete Angela Creek (Taseko), Tsulko River (Dean), and Upper Homathko (Homathko).

Survey Coverage by Traditional Territory

The distribution of forestry-related AIAs appears relatively equal among the traditional territories of resident First Nations in the CFD (Tletinqox-t'in, Tsi Del Del, Xení Gwet'in, Yunesit'in, and Ulkatcho communities), and substantial numbers of cutblocks have been assessed in each of the five traditional territories (see Arcas 1996, 1997; Klassen 1996b, 1997; Klassen and Merchant 1996; Middleton 1995, 1996; Spafford 1997, 1998). However, relatively few forestry-related AIAs have been conducted in the traditional territories of most non-resident First Nations in the CFD, especially those of the Kwakiutl, Homalco, Nuxalk, and Alkali Lake communities.

On the other hand, systematic research inventories have not been equally distributed among the traditional territories of either resident or non-resident First Nations. Of the seven systematic surveys conducted to date, six included surveys within Xení Gwet'in territory, four included surveys in Tsi Del Del territory, and one included surveys conducted in Ulkatcho territory. One of the smaller studies also included surveys in the traditional territories of the Kwakiutl and the Homalco. No systematic research inventories have been conducted in the Tletinqox-t'in and Yunesit'in territories, or in the territories of the non-resident Nazko, Nuxalk, and Alkali Lake communities.

Future systematic research inventories should be distributed equally among the traditional territories of resident First Nations, and an attempt at including all non-resident First Nations territories should also be made. This will ensure that the archaeological concerns of all First Nations are met equally, and that the archaeological knowledge within each of the respective communities is accessed. Moreover, these inventories will provide each community equal opportunities for their involvement in archaeological research and site management.

On the basis of existing research studies, the highest priority for future inventories is within Tletinqox-t'in and Yunesit'in territories, followed by Ulkatcho territory. Of the non-resident First Nations, high priority should be given to conducting studies within the traditional territories of the Nazko, Nuxalk, and Alkali Lake First Nations.

Archaeological Inventory Priorities and Recommendations

Future systematic research inventories should be designed to include representative samples of all biogeoclimatic zones, ecosections, watersheds, and traditional territories identified in the preceding analysis. Systematic survey of 5000 ha (0.2% of the CFD), distributed proportionately among all variables, is recommended as a short-term goal for research inventories. A long-term goal of 1% inventory of all variables, using all inventory project types, is also recommended. In setting priorities for future inventories, planning should initially focus on under-represented forested biogeoclimatic subzones, ecosections, major drainages, and traditional territories. The preceding analysis has identified the priorities for each of these variables, and these are summarized in order of priority in Table I4. In addition, future inventories should include representative samples of complete watersheds which encompass intermediate-sized streams, within the major drainages identified in Table I4.

TABLE I4: Recommended Variable Priorities

Priority	Biogeoclimatic Subzone	Ecosection	Major Drainage	Traditional Territory
1	SBPSdc	West Chilcotin Ranges	Atnarko Chilcotin Chilanko Klinaklini Nazko	Tletinqox-t'in Yunesit'in
2	ESSFxv	Nazko Uplands	Homathko Taseko	Ulkatcho
3	SBPSxc	Chilcotin Plateau	Dean	Tsi Del Del
4	CWHds1	Fraser River Basin	Chilko	Xeni Gwet'in
5	IDFxm MHmm2 MSxv	Northern Pacific Ranges		Nazko Nuxalk Alkali Lake
6	SBPSmk MSunc	Western Chilcotin Uplands		Kwakiutl
7	Bgxw2 IDFunc	Central Chilcotin Ranges		Homalco
8	ATp			
9	IDFdk4			
10	SBPSmc			

Based on the priorities listed in Table I4, complete watersheds can be identified which contain various combinations of the highest priority variables. In turn, the highest priority for future systematic research inventories should be given to those watersheds which contain the greatest combinations of high priority variables. On the basis of a review of all variables, and in consideration of their relative weights, the following ten watersheds are recommended for future inventory studies, in order of priority: Tautri, Tete Angela, McClinchy, Punkutlaenkut, Lower Mosley, Aneko, Hotnarko, Minton, Anahim, and Tsulko. Table I5 lists the variables encompassed within each watershed.

TABLE 15: Recommended Watershed Inventory Priorities

Priority	Watershed	Biogeoclimatic Subzone	Ecosection	Traditional Territory
1	Tautri Creek (Nazko)	SBPSdc SBPSxc	Nazko Upland Chilcotin Plateau	Tletinqox't'in Nazko
2	Tete Angela Creek (Taseko)	SBPSxc IDFdk4	Chilcotin Plateau	Yunesit'in
3	McClinchy Creek (Klinaklini)	ESSFxc SBPSxc MSxc ATp	Western Chilcotin Ranges Chilcotin Plateau	Ulkatcho Tsi Del Del Kwakiutl
4	Punkutlaenkut Creek (Chilcotin)	ESSFxc MSxc	Chilcotin Plateau	Tsi Del Del
5	Lower Mosley Creek (Homathko)	CWHds1 MHmm2 ATp	Northern Pacific Ranges	Tsi Del Del Kwakiutl Homalco
6	Aneko River (Nazko)	SBPSdc MSxc	Nazko Upland Western Chilcotin Upland	Tletinqox't'in Nazko
7	Hotnarko (Atnarko)	ESSFxc SBPSxc MSxc MSunc IDFunc	Western Chilcotin Ranges Western Chilcotin Upland	Ulkatcho Nuxalk
8	Minton Creek (Chilcotin)	IDFxm IDFdk4	Chilcotin Plateau	Yunesit'in
9	Anahim Creek (Chilcotin)	SBPSxc IDFxm IDFdk4	Chilcotin Plateau	Tletinqox-t'in
10	Tsulko River (Dean)	ESSFxc SBPSxc MSxc	Western Chilcotin Upland	Ulkatcho Nuxalk

In the selection of watershed priorities noted below, biogeoclimatic subzones were weighted more heavily than other variables, as these subzones are generally considered to be important in modelling archaeological potential. A higher weighting was also given to biogeoclimatic subzones with the greatest potential for forestry, as management of archaeological resources is most important where potential impacts are greatest. Likewise, priority was given to those watersheds located in forested biogeoclimatic subzones and ecosections where extensive forestry activities are ongoing and/or planned. Another important factor considered in setting the priorities was maintaining a

relatively equal distribution of inventories across traditional territories. Lastly, the selection of inventory priorities took into account the overall archaeological knowledge for the CFD. For example, although the Punkutlaenkut Creek watershed contained lower priority variables than other watersheds, it was given a relatively high priority because: (1) it is located in an area of extensive ongoing and planned forestry activities, (2) the biogeoclimatic subzones and ecosections encompassed by the watershed have high potential for forestry-related developments, and (3) relatively few archaeological sites and few site types have been identified in the watershed.

APPENDIX J: Data Gaps

Introduction

A brief list of data gaps and limitations resulting from use of current glacial geology and soils and surficial geology mapping available for the AOA was provided in **Section 3.6** of the **Final Report**. This appendix provides additional details on the following: (1) nature and purpose of mapping, (2) coverage of the study areas, and (3) limitations and applicability of reconnaissance mapping and terrain mapping resources.

Glacial Geology Mapping

Nature and Purpose of Mapping

Tipper (1971a, 1971b) focused on the mapping of glacial features (drumlins and grooves, eskers, meltwater channels, kettles, cirques, moraines, and lacustrine deposits) to provide a model of glacial and deglacial history. He also mapped alluvial fans. Areas of terraced topography were defined, but active fluvial floodplains within these polygons were not differentiated. The results of this work were presented on a series of seven 1:250,000 map sheets.

Coverage of the Study Areas

- There is virtually complete coverage of the Chilcotin Forest District. A small portion of the Chilcotin Ranges were not mapped, but this is not a significant gap given the nature of the mapping, which focused on glacial features of plateau areas. Only major cirques in the mountains would have been mapped in the missing areas, with little utility for estimation of archaeological potential.

Limitations and Applicability of Reconnaissance Mapping

- This work primarily mapped glacial features which were plotted as on-site symbols on the maps.
- Polygons were defined for only certain landform units (terraced outwash, lacustrine, alluvial fan). The lateral boundaries of large outwash or lacustrine areas were indicated; however, in many outwash units, the up or downstream extent was left undetermined. Thus, the full extent of some of these units is unknown.
- Detailed terrain polygons, defined by material type, geological process, slope, and texture (cf. Howes and Kenk 1988) were not mapped.
- Within outwash or glaciolacustrine units, areas of post-depositional instability (slumps) and modern fluvial activity were not differentiated.
- In upland areas other material types are not differentiated (e.g., aeolian, talus, rockslide, slump deposits, bedrock, organics and till).
- Although the scale of presentation was 1:250,000, polygons have been delineated to about 1 mm² (6 ha), or 1 mm wide (250 m) if long and narrow. This is very high resolution for the scale of presentation. The usual mapping convention allows for 1 cm²

as the smallest polygon delineation, corresponding to a minimum landscape unit of 625 ha in size for 1:250,000 scale mapping. The scale of the air-photos Tipper used for interpretation has not been indicated, but it was likely between 1:40,000 and 1:100,000 scale; therefore, air-photo polygons were scaled down, explaining the high resolution of the end product.

This mapping is highly useful for defining the extent of terraced outwash, glaciolacustrine, and medium to large sized alluvial fan units in the study area.

In terraced units, the primary drawback is that active floodplain units are not differentiated. Also, in both terraced outwash and glaciolacustrine units, areas of post-glacial slumping are not indicated. With regard to alluvial fan units, active and inactive fans (or portions thereof) are not differentiated, and small fan features are not defined (e.g. site EjSb 14; Alexander and Matson 1987). Finally, organic and aeolian deposits are not mapped.

This product used in conjunction with wetland (Moon and Selby 1983) and slope thematic mapping (TRIM) will provide a useful first order predictive tool for archaeological site potential mapping. To increase the power of the geomorphic layer in the AOA model, the differentiation of active floodplain and fan units, areas of slumping along the main valleys, and aeolian deposits should be undertaken as time and funding permit. Further differentiation of these areas can be done by referring to the 1:50,000 scale terrain maps for the areas of interest, contacting logging companies or the Ministry of Forests for 1:20,000 scale terrain or potential erosion maps, or conducting air photo interpretation.

Soils and Surficial Geology

Nature and Purpose of Mapping

Recognizing the need for resource inventory data for land management purposes, government agencies have commissioned soils and terrain mapping projects. Wide areas of the province have been mapped at 1: 50,000 scale, and specific areas have been mapped at 1:20,000 scale for forestry applications.

All terrain and soils maps available through the provincial government were listed in the Resource Mapping Inventory (Bobrowsky 1991). These consist of soils maps originally prepared for agricultural suitability and terrain inventory maps prepared by the Environmental Land Use Commission. This mapping is polygon based, with polygons defined by material type, geological process, and soil texture. With a mapping scale of 1:50,000, the minimum polygon is about 25 ha in area. Terrain mapping at 1:20,000 scale may be available from forest companies, but coverage will be limited.

Coverage of the study area

Tables J1 lists the 1:50,000 scale terrain and soils mapping available for the Chilcotin Forest District. Forty-eight 1:50,000 map sheets are required to cover the Chilcotin Forest District. Of these, only 23 map sheets (50%) with soils and/or surficial geology mapping are available. These are primarily for the eastern half of the forest district, east of Chilanko Forks.

Until recently, these maps were available through Maps B.C. However, due to recent budget cutbacks, the distribution of unpublished maps has been discontinued and the map data has been given back to the various government branches (e.g., Geological Survey Branch) and is not readily

available, except on special request. Dr. Peter Bobrowsky, head of the Geological Survey Branch would be the first contact for requests for terrain and/or soils maps.

Table J1: Soils and Surficial Geology Analog Map Coverage (1:50,000): Chilcotin Forest District

Map	Coverage	Map	Coverage	Map	Coverage	Map	Coverage
92J/13	No	92N/14	No	92O/15	Yes	93C/03	No
92J/14	No	92N/15	No	93B/01	Yes	93C/04	No
92K/16	Yes	92N/16	No	93B/02	Yes	93C/05	No
92N/01	Yes	92O/03	Yes	93B/03	Yes	93C/06	No
92N/02	Yes	92O/04	Yes	93B/04	Yes	93C/07	No
92N/06	Yes	92O/05	Yes	93B/05	Yes	93C/08	No
92N/07	No	92O/06	Yes	93B/06	Yes	93C/09	No
92N/08	No	92O/10	Yes	93B/07	Yes	93C/10	No
92N/09	No	92O/11	Yes	93B/11	Yes	93C/11	No
92N/10	No	92O/12	Yes	93B/12	Yes	93C/12	No
92N/11	No	92O/13	Yes	93C/01	No	93C/13	NE Portion
92N/13	No	92O/14	Yes	93C/02	No	93C/14	No

Limitations and Applicability of Terrain Mapping Resources

Scale terrain/soils maps at 1:50,000 scale represent an ideal format with which to include geomorphological data in a predictive model. Knowledge of material type and process gives information on surface age and taphonomic factors (Appendix G), and disregarding other factors, a relative index of site potential. Polygons down to a minimum size of 25 ha provides high resolution, contributing to model power.

Recent budget cutbacks may make it difficult to assemble this data, and all maps may not all be available in digital form. Some of this data could be accessed to improve the power of the information available at 1:250,000 scale.

Modelling of archaeological site potential should utilize the available surficial geology mapping to maximize predictive accuracy and power. At the present time the best strategy would be to combine specific data from larger scale mapping sources (e.g., terrain, wetland, slope thematic) with the 1:250,000 glacial reconnaissance maps: utilize the mapping of Tipper (1971b) to identify all terraced outwash, lacustrine, and medium to large alluvial fan landforms; and then increase the power of the base layer by: (1) differentiating active fluvial floodplain and alluvial fan surfaces from terraces and inactive fans, (2) adding all wetland areas, (3) adding all areas of post-glacial slumping within the main valley corridors, (4) adding mapped loess deposits, and (5) splitting genetic polygons by slope class.

APPENDIX K: Consultation With First Nations As An Archaeological Management Action

As stated in the **Volume 1: Final Report**, the primary goal of this AOA was to prepare a set of maps and recommendations which would assist with the effective identification, protection, and management of archaeological sites within the Chilcotin Forest District (Volume 1:1). The entire CFD was mapped in terms of four classes of archaeological site potential, and specific management actions were recommended for future development activities on lands in each of these four classes (Volume 1:68-70). These management actions include different kinds and levels of archaeological work as well as consultation with relevant aboriginal communities on development specific archaeological concerns. These actions are considered to be minimum actions and methodologies (Volume 1:68). These archaeological management actions are summarized in Table 14 of the **Final Report** (Volume 1:70).

The **Final Report** explains the reasons for including aboriginal community (First Nation) consultation as a recommended archaeological management action (Volume 1:68). Consultation is **strongly** recommended for all proposed developments, regardless of the class of archaeological potential predicted by the AOA for the development location (Volume 1:68), and the report states that this consultation should be meaningful (Volume 1:68). However, the report does not define what constitutes meaningful consultation in the context of these recommendations. It is apparent from discussions held after completion of the **Final Report** that this term should be defined, and that is the purpose of this appendix.

The objectives of aboriginal community consultation as an archaeological management action are twofold:

- (1) to obtain aboriginal community assessment of archaeological site potential in the proposed development area based on their knowledge of past aboriginal land use and on any information they might have about archaeological sites in the area, and
- (2) to obtain, consider and, where possible, implement the aboriginal community perspective on the appropriate **archaeological** management actions for the proposed development.

In order to meet these two objectives, consultation should include a discussion of the proposed development project in terms of its potential impact on archaeological sites, and on the appropriate actions to identify, minimize, and if possible, avoid such impacts. All aboriginal communities who claim an interest in the land where the development is proposed should be included in these discussions. Aboriginal communities will have their own requirements for meaningful consultation, but in our view these discussions should include **at least** the following:

- the discussions should be initiated by the development proponent, or the authorized representative retained by the proponent, **well in advance** of the proposed development to allow for sufficient time for the implementation of appropriate archaeological management actions;
- the aboriginal community has a responsibility to respond to requests for such a discussion in a timely manner;

- unless otherwise **mutually** agreed upon, the discussions should involve one or more meetings between representatives of the proponent and of the aboriginal community; an unreturned telephone call does not represent an adequate attempt at consultation;
- the proponent should discuss the development with an authorized representative of the aboriginal community;
- discussions with other unauthorized members of aboriginal communities should not be accepted by the proponent, the aboriginal community, or government agencies as meeting the requirement of consultation;
- to help identify an authorized representative, the aboriginal community should make available a list of authorized representatives, and the means of contacting those representatives;
- proponents should supply the aboriginal community with up-to-date maps and other relevant information for their assessment of archaeological potential and concerns;
- if desired by the aboriginal community, a preliminary archaeological field reconnaissance (ground reconnaissance) of the proposed development location should be undertaken with an authorized representative of the community and with other members of the community who may have some knowledge of that site or area, if they are available; and,
- the discussions/meetings should be conducted in good faith and with mutual respect.

APPENDIX L: Bibliography

Alexander, D.

- 1997 *A Cultural Heritage Overview of the Cariboo Forest Region*. Report on file with the Ministry of Forests-Cariboo Forest Region, Williams Lake.

Alexander, D. and R. G. Matson

- 1987 *Report on the Potato Mountain Archaeological Project (1985)*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Alexander, D., R. Tyhurst, R.G. Matson, and L. Burnard

- 1985 *A Preliminary Ethnoarchaeological Investigation of the Potato Mountain Range and the Eagle Lake Area*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Alley, N. F.

- 1976 The Palynology and Palaeoclimatic Significance of a Dated Core of Holocene Peat, Okanagan Valley, Southern British Columbia. *Canadian Journal of Earth Science* 13:1131-1144.

Anderson, T.W., R.W. Mathewes, and C.E. Schweger

- 1989 Holocene Climatic Trends in Canada with Special Reference to the Hypsithermal Interval. In *Quaternary Geology of Canada and Greenland*, edited by R.J. Fulton. Geological Survey of Canada, no 1:520-524.

Apland, B.

- 1979 Reconnaissance Survey in the Rainbow Mountains Region of West-Central British Columbia. In *Annual Report for the Year 1976: Activities of the Archaeological Sites Advisory Board*, pp. 14-36.

Apland, B., and R. Kenny

- 1995 *British Columbia Archaeological Impact Assessment Guidelines*. Archaeology Branch, Victoria.

Arcas Associates

- 1985 *Excavations at the Rattlesnake Hill Site (EeRh 61), Ashcroft, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria.

Arcas Consulting Archeologists Ltd.

- 1995 *Preliminary Archaeological Impact Assessment, Proposed Logging Development, TSL A50867 (Young Creek) Near Alexis Creek, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Arcas Consulting Archeologists Ltd. (Mike Brand and Amber Ridington)

- 1996 *Archaeological Impact Assessments of Forestry Developments on the Chilcotin Plateau, 1995*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Arcas Consulting Archeologists Ltd. (Mary De Paoli)

- 1997 *Final Report for Archaeological Impact Assessments of Forestry Developments in the Chilcotin Forest District Conducted Under Permit 1996-048*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Arcas Consulting Archeologists Ltd. (Michael A. Klassen and Amber Ridington)

- 1998a *Chilko River Archaeological Inventory Sample Study: Phase 1 (1997)*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Arcas Consulting Archeologists Ltd. (Amber Ridington and Michael A. Klassen)

- 1998b *Archaeological Site EkSa-11, Chilko River B.C. Archaeological Impact Assessment (Conducted Under Permit 1997-266)*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Arcas Consulting Archeologists Ltd. (Mary De Paoli)

- 1998c *Final Report for Archaeological Assessments of Forestry Developments in the Chilcotin Forest District Conducted Under Permit 1997-097*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria, B.C.

BC Forest Service and BC Environment

- 1995a *Forest Practices Code of British Columbia: Riparian Management Area Guidebook*. Queen's Printer for British Columbia, Victoria.

- 1995b *Forest Practices Code of British Columbia: Fish-stream Identification Guidebook*. Queen's Printer for British Columbia, Victoria

Birchwater, S.

- 1991 *Ulkatchot'en: The People of Ulkatcho*. Ulkatcho Curriculum Development Committee, Anahim Lake, B.C.

- 1993 *Ulkatcho Stories of the Grease Trail, Anahim Lake - Bella Coola - Quesnel: Told by Ulkatcho and Nuxalk Elders*. Ulkatcho Indian Band, Anahim Lake, B.C.

Blacklaws, R., S. Fuller, and C. Trauman

- 1984 *B.C. Hydro Homathko Development Generation Preliminary Heritage Inventory and Assessment*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Bobrowsky, P.

- 1991 *Resource Mapping Inventory*. Ministry of Environment, Lands and Parks, Surveys and Resource Mapping Branch. Victoria.

Bovis, M. and P. Jones

- 1992 Holocene History of Earthflow Mass Movements in South Central British Columbia: the Influence of Hydroclimatic Changes. *Canadian Journal of Earth Sciences* 29:1746-1755.

Brown, R.

- n.d. *Scrapbooks and Miscellaneous Data on Vancouver Island*. ADD Mss 794, manuscript on file, B.C. Archives.

Burnard-Hogarth, L.

- 1983 Ethnoarchaeological Investigations in the Chilcotin Region of B.C.: Summer 1983. Report of File at Arcas Consulting Archeologists Ltd., Coquitlam, B.C.

- 1984 Ethnoarchaeological Investigations in the Chilcotin Region. In *Athapaskan and Earlier Archaeology at Big Eagle Lake, British Columbia*, edited by M. Magne and R.G. Matson, pp. 45-78. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Burnard-Hogarth, L.

- 1987 *Metes and Bounds: A Search for Archaeological Indicators of Hunter-Gatherer Territoriality*. Unpublished Master's Thesis, Department of Anthropology and Sociology, University of British Columbia, Vancouver, B.C.

Bussey, J.

- 1983 *Alexis Creek Archaeological Investigations*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

- 1991 *Heritage Resource Inventory and Impact Assessment Quesnel, Williams Lake, and McBride Highways Districts, 1991*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Bussey, J. and D. Alexander

- 1992 *Archaeological Assessment of the Cariboo Forest Region*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Carriere, R.

- 1997 *An Archaeological Impact Assessment for Ministry of Forests Small Business Forest Enterprise Program 1997-1998, Timber Harvesting, Road Construction, and Related Activities within the Chilcotin Forest District*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

CCLUP Caribou Strategy Committee

- 1996 *1996 Caribou Strategy Report*. Report on file with the Ministry of Environment, Lands, and Parks, Cariboo Region, Williams Lake.

Church, M. and J.M. Ryder

- 1972 *Para-glacial Sedimentation: a Consideration of Fluvial Processes Conditioned by Glaciation*. *Geological Society of America Bulletin* 83:3059-3072.

Clague, J.J.

- 1981 *Late Quaternary Geology and Geochronology of British Columbia. Part 2: Summary of Radiocarbon-dated Quaternary History*. *Geological Survey of Canada Paper* 80-35.

- 1987 *Quaternary Stratigraphy and History, Williams Lake, British Columbia*. *Canadian Journal of Earth Sciences* 24:147-158.

- 1988 *Quaternary Stratigraphy and History, Quesnel, British Columbia*. *Geographie Physique et Quaternaire* 42(3):279-288.

Clague, J.J., S.G. Evans, R.J. Fulton, J.M. Ryder, and A.H. Stryd

- 1987 *Quaternary Geology of the Southern Canadian Cordillera. XIIth Inqua Congress Field Excursion A-18*. Ottawa, Ontario.

Clague, J.J. and G.M. Macdonald

- 1989 *Paleoecology and Paleoclimatology (Canadian Cordillera)*. In *Quaternary Geology of Canada and Greenland*, edited by R.J. Fulton, pp. 70-74. Geological Survey of Canada.

Clague, J.J. and R.W. Mathewes

- 1992 Early Holocene Thermal Maximum in Western North America: New Evidence from Castle Peak, British Columbia. *Geology* 17:277-280.

Clague, J.J., R.W. Mathewes, W.M. Buhay, and T.W.D. Edwards

- 1992 Early Holocene Climate at Castle Peak, Southern Coast Mountains, British Columbia, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology* 95:153-167.

Commission on Resources and Environment

- 1994 *Cariboo-Chilcotin Land Use Plan*. Government of British Columbia, Victoria.

Coupe, R., A.C. Stewart, and B.M. Wikeem

- 1991 Engleman Spruce Subalpine Fir Zone. In *Ecosystems of British Columbia*, edited by Meidinger, D. and J. Pojar, pp. 223-235. Special Report Series 6, Research Branch, Ministry of Forests, Victoria.

Cowan, Ian McTaggart and Charles J. Guiguet

- 1965 *The Mammals of British Columbia*. Handbook No. 11. 3rd edition, British Columbia Provincial Museum, Victoria.

Cox, R.

- 1832 *The Columbia River: or Scenes and Adventures During A Residence of Six Years on the Western Side of the Rocky Mountains Among Various Tribes of Indians Hitherto Unknown*. 2 Volumes, Third Edition, Henry Colburn, London.

Cwynar, L.C.

- 1987 Fire and Forest History of the North Cascade Range. *Ecology* 68(4):791-802.

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 Significance. *Canadian Journal of Archaeology* 5:59-60.

Darwent, J. (Norcan Consulting Ltd.)

- 1994 *Archaeological Inventory and Assessment of Timber Harvesting Areas in the Anahim Lake Timber Supply Block, British Columbia*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Darwent, J. And Chris Darwent (Norcan Consulting Ltd.)

- 1995 *Archaeological Impact Assessment of Timber Harvesting Areas in the Anahim Lake Timber Supply Block, British Columbia*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Delcourt, H.R., P.A. Delcourt and T. Webb

- 1983 Dynamic Plant Ecology: the Spectrum of Vegetational Change in Space and Time. *Quaternary Science Reviews* 1:153-175.

Demarchi, D.A., R.D. Marsh, A.P. Harcombe, and E.C. Lea

- 1990 The Environment. In *The Birds of British Columbia, Volume 1: Nonpasserines*. Royal British Columbia Museum, Victoria and Environment Canada, Ottawa.

Department of Fisheries and Oceans

- 1991 Fish Habitat and Information Program: Stream Summary Catalogue, Subdistricts #8 Bella Coola, #12 Alert Bay, #13N Campbell River, and #29G Williams Lake. Fisheries and Oceans Canada, Ottawa and BC Environment, Victoria.

Donahue, P. F.

- 1970 Excavations at Algatcho and Tezli on the Central Plateau of British Columbia. A preliminary report submitted to the National Museum of Man, Ottawa. Report on file, Culture Department Library. Ministry of Small Business Tourism and Culture, Victoria.
- 1971 Excavations in Southern Carrier Indian Territory. *The Midden* 3(2):4-11.
- 1972a Preliminary Report of Excavations at Tezli (FgSd-1) British Columbia. Report submitted to the National Museum of Man, Ottawa, Explorers Club, New York. Report on file, Culture Department Library. Ministry of Small Business Tourism and Culture, Victoria.
- 1972b Excavations at Tezli. *The Midden* 4(2):12-14.
- 1973 Ulkatcho: An Archaeological Outline. *Syesis* 6:153-178.
- 1975 Concerning Athapaskan Prehistory in B.C. *The Western Canadian Journal of Anthropology* 5(3-4):21-64.
- 1977 *4500 Years of Cultural Continuity on the Central Interior Plateau of British Columbia*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Wisconsin-Madison.

Driver, J.C

- 1988 Late Pleistocene and Holocene Vertebrates and Paleoenvironments from Charlie Lake Cave, Northeast British Columbia. *Canadian Journal of Earth Sciences* 25:1545-1553.

Driver, J.C., M. Handley, K.R. Fladmark, D.E. Nelson, G.E. Sullivan, and R. Preston

- 1996 Stratigraphy, Radiocarbon Dating, and Culture History of Charlie Lake Cave, British Columbia. *Arctic* 49(3):265-277.

Eldridge, M. and A. Eldridge.

- 1980 *An Evaluation of the Heritage Resource Potential of the Dean River Valley: Final Report on the Cariboo Planning Study*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Equinox Research and Consulting Ltd.

- 1997 Archaeological Data Gap Analysis of Thirty-four Forest Districts within British Columbia. Report prepared for Aboriginal Affairs Branch, Ministry of Forests. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Farrand, L.

- 1898 The Chilcotin. *Report of the British Association for the Advancement of Science*. 68:645-648
- 1900 Traditions of the Chilcotin Indians. *Memoirs of the American Museum of Natural History, The Jesup North Pacific Expedition* 2(1):1-54.

Feast, A., and Michael A. Klassen

- 1997 *An Archaeological Impact Assessment of Tsi Del Del Enterprises Limited's Cutting Permits 104, 105, 109, 110, 112, and 963 (Forest Licence A49778) in the Satah Mountain and Chantslar Lake Areas, Chilcotin Forest District, South-Central B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Fladmark, K.N.

- 1982 An Introduction to the Prehistory of British Columbia. *Canadian Journal of Archaeology* 6:95-156.

Fraser, S.

- 1960 *The Letters and Journals of Simon Fraser 1806-1808.*, edited by W. Kaye Lamb, MacMillan of Canada, Toronto.

Friele, P.A.

- 1987 Archaeological Site Visibility in South Central British Columbia. Paper presented at the Canadian Archaeological Association Conference, 1987. Calgary, Alberta.

Friesen, D. (Aresco Ltd.)

- 1994 *A Cultural Heritage Resource Inventory of Proposed Roads and Cutblocks for Timber Sale Licenses A35854 (Abuntlet Lake) and 46492 (Hooch Lake).* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Fulton, R.J.

- 1967 Deglaciation Studies in Kamloops Region, an Area of Moderate Relief, British Columbia. *Geological Survey of Canada, Bulletin* 154.

- 1969 Glacial Lake History, Southern Interior Plateau, British Columbia. *Geological Survey of Canada Paper* 69-37.

Furniss, E.

- 1993a *Changing Ways - Southern Carrier History, 1793-1940.* Quesnel School District (#28), Quesnel, B.C.

- 1993b *Dakelh Keyoh: The Southern Carrier in Earlier Times.* Quesnel School District (#28), Quesnel, B.C.

Germann, C.

- 1979a *Report of the Cariboo Regional Archaeological Impact Assessment - 1978.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

- 1979b *Report of the Cariboo Regional Archaeological Impact Assessment - 1979.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Goldman, I.

- 1940 The Alkatcho Carrier of British Columbia. In *Acculturation in Seven American Indian Tribes*, edited by Ralph Linton, pp. 333-386. D. Appleton-Century, New York.

- 1941 The Alkatcho Carrier: Historical Background of Crest Prerogatives. *American Anthropologist* 43:396-418.

Gryba, E.M.

- 1983 *Sibbald Creek: 11 000 Years of Human Use of the Alberta Foothills.* Archaeological Survey of Alberta, Occasional Paper 22. Edmonton, Alberta.

Harmon, D.W.

- 1903 *A Journal of Voyages and Travels in the Interior of North America.*, edited by A.S. Barnes, New York.
- 1957 *Sixteen Years in the Indian Country: The Journal of Daniel Williams Harmon, 1800-1816*, edited by W. Kaye Lamb. The MacMillan Company of Canada Ltd., Toronto.

Harris, R. C.

- 1975 Tsooloss Ridge: South of Nemaia Valley. *B.C. Outdoors* October:22-23.
- 1976 Snowshoe Plateau. *B.C. Outdoors* August:68-69.
- 1978 Hunlen Falls and the Turner Lakes: Lonesome Lake Area. *B.C. Outdoors* December:14-15.
- 1979 Lt. Palmer's Precipice. *B.C. Historical News* 13(1):22-28.
- 1984a Tchaikazan-Yohetta. *B.C. Outdoors* June:E4-E5.
- 1984b Hiking to the End of the Rainbows. *B.C. Outdoors* July:E6-E8.
- 1989 The Lunos Trail: from the Precipice on Hotmarko River to Nimpo Lake. *B.C. Historical News* Spring:14-15.

Hart, S.

- 1994 An Investigation of a Segment of the Palmer Route within the Chilcotin Forest District. Report prepared for the Ministry of Forests, Chilcotin Forest District.

Hayden, B.

- 1992 Introduction. In *A Complex Culture of the British Columbia Plateau: Traditional Stlatl'imx Resource Use*, edited by B. Hayden, pp. 3-46. UBC Press, Vancouver.

Hebda, R.J.

- 1982 Postglacial History of Grasslands of Southern British Columbia and Adjacent Regions. In *Grassland Ecology and Classification, Symposium Proceedings, June 1982*, edited by A.C. Nichol森, A. McLean, and T.E. Baker, pp. 157-191. British Columbia Ministry of Environment, Victoria, B.C.
- 1995 British Columbia Vegetation and Climate History with Focus on 6 ka. BP. *Geographie Physique et Quaternaire* 49(1):55-79.
- 1997 Impact of Climate Change on Biogeoclimatic Zones of British Columbia and Yukon. In *Responding to Global Climate Change in British Columbia and Yukon. Volume 1 of the Canada Country Study: Climate Impacts and Adaptation*, edited by E. Taylor and B. Taylor. Environment Canada, Yukon.

Hebda, R.J. and R.W. Mathewes

- 1984 Holocene History of Cedar and Native Indian Cultures of the North Pacific Coast. *Science* 225:711-713.

Hebda, R.J. and C. Whitlock

- 1997 Environmental History of the Coastal Temperate Rain Forests. In *The Rainforests of Home: A Portrait of a North American Bioregion*, edited by P. Schoonmaker, B. Van Hagen, and E.C. Wolf, pp. 227-254. Island Press. Washington, D.C.

Helmer, J. W.

- 1977 Points, People, and Prehistory: A Preliminary Culture History in North Central British Columbia. In *Problems in the Prehistory of the North American Subarctic: the Athapaskan Question*, edited by J. Helmer, S. Van Dyke, and F. J. Kense, pp. 90-96. Calgary Archaeological Association, Department of Archaeology, University of Calgary, Calgary, Alberta.

Heusser, C.J., L.E. Heusser, and D.M. Peteet

- 1985 Late-Quaternary Climatic Change on the American North Pacific Coast. *Nature* 315:485-487.

Heusser, C.J., L.E. Heusser, and S.S. Streeter

- 1980 Quaternary Temperatures and Precipitation for the North-West Coast of North America. *Nature* 286:702-704.

Hewer, T.

- 1996 *Archaeological Overview Assessment, Chilcotin Forest District, South of the Chilcotin River, East of Taseko River, Final Report*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Hewlett, E.S.

- 1972 *The Chilcotin Uprising: A Study of Indian-White Relations in Nineteenth Century British Columbia*. Unpublished Master's thesis, Department of History, University of British Columbia.

- 1973 The Chilcotin Uprising of 1864. *B.C. Studies* 19:50-72.

Holland, S.S.

- 1976 *Landforms of British Columbia: a Physiographic Outline*. British Columbia Department of Mines and Petroleum Resources, Bulletin 48.

Hope, G.D., D.A. Lloyd, W.R. Mitchell, W.R. Erickson, W.L. Harper, and B.M. Wikeem

- 1991 Interior Douglas-fir Zone. In *Ecosystems of British Columbia*, edited by D. Meidinger and J. Pojar, pp. 153-166. Special Report Series 6, Research Branch, Ministry of Forests, Victoria.

Hope, G.D., W.R. Mitchell, D.A. Lloyd, W.L. Harper, and B.M. Wikeem

- 1991 Montane Spruce Zone. In *Ecosystems of British Columbia*, edited by D. Meidinger and J. Pojar, pp. 183-194. Special Report Series 6, Research Branch, Ministry of Forests, Victoria.

Howe, D. G.

- 1980 *Report of the Vancouver Island, Lower Mainland, Cariboo Regional Archaeological Impact Assessment, 1980*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

- 1981 *Report of the Vancouver Island, Lower Mainland, Cariboo Regional Archaeological Impact Assessment, 1981*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Howes, D.E. and E. Kenk

- 1988 *Terrain Classification System for British Columbia*. MoE Manual 10. Ministry of the Environment, Victoria.

Huntley, D.H. and B.E. Broster

- 1994 Glacial Lake Camelsfoot: a Late Wisconsinan Advance Stage Proglacial Lake in the Fraser River Valley, Gang Ranch Area, British Columbia. *Canadian Journal of Earth Sciences* 31:798-807.

Huntley, D.H. and B.E. Broster

- 1997 The Late Wisconsinan Deglacial History of the East-Central Taseko Lakes area, British Columbia. *Canadian Journal of Earth Sciences* 34:1510-1520.

Kearney, M.S. and B.H. Luckman

- 1983a Holocene Timberline Fluctuations in Jasper National Park, Alberta. *Science* 221: 261-263.

- 1983b Postglacial Vegetational History of Tonquin Pass, British Columbia. *Canadian Journal of Earth Sciences* 20:776-786.

Kershaw, A. and J. Spittle

- 1978 *The Bute Inlet Route: Alfred Waddington's Wagon Road, 1862- 1864*. Okanagan College, Kelowna.

Klassen, M.A.

- 1996a *An Archaeological Impact Assessment of the Ministry of Forests-Chilcotin Forest District's Proposed Tatlayoko Lake North Woodlot*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

- 1996b *An Archaeological Impact Assessment of 82 Proposed Timber Harvesting Blocks and Associated Access Roads, Conducted for Riverside Forest Products in the Chilcotin Forest District, Southwestern B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

- 1997 *An Archaeological Impact Assessment of Riverside Forest Products Ltd.'s 1996/1997 Operation Areas in the Chilcotin Forest District, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Klassen, M.A. and P. Merchant

- 1996 *An Archaeological Impact Assessment of 104 Proposed 1995 and 1996 Small Business Enterprise Timber Harvesting Blocks and Associated Access Roads in the Chilcotin Forest District, Southwestern B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Klassen, M.A. and A. Stryd

- 1996 *Archaeological Review of the Five-Year Consolidated Forest Development Plan for the Chilcotin Forest District*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Kopas, C.

- 1976 *Packhorses to the Pacific*. Gray's Publishing, Sidney.

Kuhn, J.A.

- 1996 *Final Report: Bidwell Creek Watershed, Fish Habitat, Road Condition, and Riparian/Wetland Assessments*. Summit Environmental Consultants, Ltd. Vernon. Report on file with the Tsilhqot'in National Government, Williams Lake.

Lamb, W. Kaye, editor

- 1957 *Sixteen Years in the Indian Country: The Journal of Daniel Williams Harmon 1800-1816*. The MacMillan Company of Canada Ltd., Toronto.

Lane, R.

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

- 1981 Chilcotin. In *The Handbook of North American Indians, Volume 6: Subarctic*, edited by J. Helm, pp. 402-412. Smithsonian Institution, Washington.

MacDonald, G.M.

- 1987 Postglacial Development of the Subalpine-Boreal Transition Forest of Western Canada. *Journal of Ecology* 75:303-320.

Mackenzie, Sir. A.

- 1995(1962)*Journal of the Voyage to the Pacific*, edited by W. Sheppe, Dover Publications, New York.

McGillvary, J.P.

- 1947[1827] Report of Fort Alexandria, Western Caledonia, Columbia River District Outfit 1827. Appendix A, Part III in *Simpson's 1828 Journey to the Columbia*. *Publications of the Hudson's Bay Record Society* 10:188-221.

Magne, M.

- 1984 *Taseko Lakes Prehistory Project: Report on a Preliminary Survey*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

- 1985 *Taseko Lakes Prehistory Project Phase II: Preliminary Excavations*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Magne, M. and R.G. Matson

- 1984 *Athapaskan and Earlier Archaeology at Big Eagle Lake, British Columbia*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Mathewes, R.W.

- 1985 Paleobotanical Evidence for Climatic Change in Southern British Columbia During Late-Glacial and Holocene Time. In *Climate Change in Canada 5: Critical Periods in the Quaternary Climatic History of Northern North America*, edited by C.R. Harington. *Syllogeus* 55:397-422.

Mathewes, R.W. and L.H. Heusser

- 1981 A 12 000 Year Palynological Record of Temperature and Precipitation Trends in Southwestern British Columbia. *Canadian Journal of Botany* 59:707-710.

Mathewes, R.W. and M. King

- 1989 Holocene Vegetation, Climate, and Lake Level Changes in the Interior Douglas Fir Biogeoclimatic Zone, British Columbia. *Canadian Journal of Earth Sciences* 26:1811-1825.

Matson, R.G., M. Magne, D. Ludowicz, and D.L. Pokotylo

- 1980 *The Eagle Lake Project: Report on the 1979 Season*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Meidinger, D. and J. Pojar

- 1991 *Ecosystems of British Columbia*. Research Branch, Ministry of Forests, British Columbia, Victoria.

Meidinger, D. and G. Reynolds

- 1997 Climatic Summaries for the Biogeoclimatic Zones of British Columbia, Version 4. February 25, 1997. Available on the Internet.

Messier, J. and M. Eldridge

- 1997 *Upper Dean River Woodlots: An Archaeological Impact Assessment in the Chilcotin Forest District*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Metz, D. And M. Klassen

- 1997 *An Archaeological Impact Assessment of Four Properties for BC Lands' (Cariboo Region) Proposed Residential and Commercial Land Developments*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Middleton, H.

- 1996 *Archaeological Impact Assessment of Four Timber Harvesting Areas in the Anahim Lake Timber Supply Block, West Chilcotin Forest District Under TSL A 47409*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

- 1997 *Anahim Lake Archaeology: An Archaeological Impact Assessment of Timber Harvesting Areas in the West Chilcotin Forest District*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Mitchell, D.H.

- 1964 *An Archaeological Survey on the Chilcotin Plateau and in the Bella Coola Valley: Interim Report and Recommendations*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

- 1970a Archaeological Investigations on the Chilcotin Plateau 1968. *Syesis* 3:45-65.

- 1970b Excavations on the Chilcotin Plateau: Three Sites, Three Phases. *Northwest Anthropological Research Notes* 4:99-116.

Mitchell, M.

- 1997a *An Archaeological Impact Assessment of Twenty-Two Proposed Small Business Timber Sale Licences and Associated Access Roads, and a Proposed Woodlot, and a Post-Impact Assessment of Site EkSa 63, on Behalf of the Ministry of Forests, Chilcotin Forest District, South Central B.C. Archaeology Branch Permit No. 1996-148*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

- 1997b *An Archaeological Impact Assessment of Forty-Seven Proposed Timber Harvesting Blocks and Associated Access Roads on Behalf of Riverside Forest Products, Soda Creek Division, Chilcotin Forest District, South Central B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Moon, D.E. and C.J. Selby

- 1983 Wetland Systems of the Cariboo-Chilcotin Region of British Columbia. In *Proceedings, Peatland Inventory Methodology Workshop*, Agriculture Canada Pedological Unit, Ottawa, Ontario. pp. 54-74.

Morice, A. G.

- 1890 The Western Denes: Their Manners and Customs. In *Proceedings of the Canadian Institute*, Third Series, 25(152):109-174.
- 1893 Notes Archaeological, Industrial, Sociological on the Western Denes. In *Transactions of the Canadian Institute, Session 1892-1893*, 4:1-222.
- 1905 *The History of the Northern Interior of British Columbia*. Reprint. Interior Stationary, 1978. Smithers, B.C.
- 1906 The Canadian Denes. In *Ontario Department of Education, Report to the Minister; Appendix: Annual Archaeological Report*, pp. 187-219.

Mule Deer Winter Range Strategy Committee

- 1996 *Regional Mule Deer Winter Range Strategy for the Cariboo-Chilcotin Land Use Plan*. Report on file with the Ministry of Environment, Lands, and Parks, Cariboo Region, Williams Lake.

Nelson, E. and G. Will

- 1976 Obsidian Sources in the Anahim Peak area. In *Current Research Reports*, edited by R. L. Carlson, pp. 151-154.. Department of Archaeology Publication Number 3, Department of Archaeology, Simon Fraser University, pp. 151-154.

Palmer, Lt. H. S.

- 1863a Letters to Lt. Col. R.C. Moody (Chief Commissioner of Lands and Works, Colonial Government of British Columbia) from the Cariboo dated August 13, 17, and 27, 1862. Copies in Public Archives of B.C., Victoria and Williams Lake Public Library Archives (transcribed by John Roberts).
- 1863b *Report of a Journey of Survey from Victoria to Fort Alexander via North Bentinck Arm*. Royal Engineer Press, New Westminster.

Parish, R., R. Coupe, and D. Lloyd

- 1996 *Plants of Southern Interior British Columbia*. BC Ministry of Environment, Victoria and Lone Pine Publishing, Vancouver.

Rafferty, P.

- 1976 *Northwest Regional Survey: Cariboo Skeena Region*. Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Ray, V.F.

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

Richards, T., and M. K. Rousseau

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

Ryder, J.M.

- 1971 The Stratigraphy and Morphology of Para-glacial Alluvial Fans in South Central British Columbia. *Canadian Journal of Earth Sciences* 8:279-298.

- 1989 Holocene Glacier Fluctuations (Canadian Cordillera); In *Quaternary Geology of Canada and Greenland*, edited by R.J. Fulton, pp. 74-76. Geological Survey of Canada, no 1.

Ryder, J.M., R.J. Fulton, and J.J. Clague

- 1991 The Cordilleran Ice Sheet and the Glacial Geomorphology of Southern and Central British Columbia. *Geographie Physique et Quaternaire* 45(3):365-377.

Ryder, J.M., M.J. Bovis, and M. Church

- 1990 Rock Avalanches at Texas Creek, British Columbia. *Canadian Journal of Earth Sciences* 27:1316-1329.

Scott, W.B. and E.J. Crossman

- 1973 *Freshwater Fishes of Canada*. Bulletin 184, Fisheries Research Board of Canada, Ottawa.

Smith, M.

- 1877a Report on Surveying Operations in the Mountain Region During the Year 1874. Appendix F in *Report on Surveys and Preliminary Operations on the Canadian Pacific Railway up to January 1877*, edited by S. Fleming, pp. 107-136.

- 1877b Report on the Surveys in British Columbia During the Year 1875. Appendix I in *Report on Surveys and Preliminary Operations on the Canadian Pacific Railway up to January 1877*, edited by S. Fleming, pp. 107-136.

Souther, J.G., J.J. Clague, and R.W. Mathewes

- 1987 Nazko Cone: a Quaternary Volcano in the Eastern Anahim Belt. *Canadian Journal of Earth Sciences* 24:2477-2485.

Souther, J.G., and M. Souther

- 1994 The Ilgachuz Range and Adjacent Parts of the Interior Plateau, B.C. Bulletin 462, *Geological Survey of Canada*, Ottawa.

Spafford, J.

- 1997a *An Archaeological Impact Assessment Study in Seven of TimberWest Forest Ltd.'s Cutting Permits in the Chilcotin Forest District, Southcentral B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

- 1997b *An Archaeological Impact Assessment of Weldwood of Canada Limited's Proposed Timber Harvesting Blocks and Associated Access Roads in Cutting Permits 980, 981, 982, and 983 in the Chilcotin Forest District, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism, and Culture, Victoria.

Spafford, J. and M.A. Klassen.

- 1995 *An Archaeological Impact Assessment of Michel's Garden, A Twenty-Five Hectare Property Near Redstone Flat in South-Central B.C.* Archaeology Branch Permit No. 1995-054. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

Spalding, David

1990 The Early History of Moose (*Alces alces*): Distribution and Relative Abundance in British Columbia. *Contributions to Natural Science* 11:1-12.

1992 The History of Elk (*Cervus elaphus*) in British Columbia. *Contributions to Natural Science* 18:1-24.

Spooner, I.S., L.V. Hills, and G.D. Osborn

1997 Reconstruction of Holocene Changes in Alpine Vegetation and Climate, Susie Lake, British Columbia. *Arctic and Alpine Research* 29(2):156-163.

Steen, O. and D.A. Demarchi

1991 Sub-Boreal Pine Spruce Zone. In *Ecosystems of British Columbia*, edited by Meidinger, D. and J. Pojar, pp. 195-207. Special Report Series 6, Research Branch, Ministry of Forests, Victoria.

Steward, J.H.

1960 Carrier Acculturation: The Direct Historical Approach. In *Culture in History: Essays in Honor of Paul Radin*, edited by S. Diamond, pp. 732-744. Columbia University Press, New York.

Stryd, Arnoud

1997 *Culturally Modified Trees of British Columbia: A Handbook for the Identification and Recording of Culturally Modified Trees*. Province of British Columbia Ministry of Forests, Vancouver Forest Region.

Stryd, A.R. and M.K. Rousseau

1996 The Early Prehistory of the Mid Fraser-Thompson River Area. In *Early Human Occupation in British Columbia*, edited by Roy L. Carlson and Luke Dalla Bona, pp. 177-204. UBC Press, Vancouver.

Swannell, F.

1961 Lieutenant Palmer Makes a Survey. *The Beaver* 20:33-38.

Teit, J.A.

1909 The Shuswap. *Memoirs of the American Museum of Natural History* 4:7:447-758.

Tiedemann, H. O.

1862 Journal of the Exploration for a Trail from the Head of Bute Inlet to Fort Alexandria in the Year 1862. Unpublished manuscript on file, B.C. Archives.

Thomson, S. and J. Mekechuk

1982 A Landslide in Glacial Lake Clays in Central British Columbia. *Canadian Geotechnical Journal* 19:296-306.

Tipper, H.W.

1971a *Glacial Geomorphology and Pleistocene History of Central British Columbia*. Geological Survey of Canada, Bulletin 196. Department of Energy, Mines and Resources, Ottawa.

1971b Multiple Glaciation in Central British Columbia. *Canadian Journal of Earth Sciences* 8:743-752.

Tobey, M. L.

1981 The Carrier. In *Handbook of North American Indians, Volume 6: The Subarctic*, edited by June Helm, pp. 413-432. Smithsonian Institution, Washington, D.C.

Tranquillini, W.

- 1979 *Physiological Ecology of the Alpine Timberline: Existence of High Altitudes with Special Reference to the European Alps*. New York: Springer Verlag.

Tyhurst, R.

- 1984 The Chilcotin: An Ethnographic History. Draft of an unpublished Ph.D. dissertation. Manuscript on file at Arcas Consulting Archeologists Ltd., Coquitlam, B.C.

- 1995 Fish Lake Heritage Resource Study: Report on the 1993 Archaeological Survey of the Fish Lake Mine Project and Access Corridor in South Central British Columbia. Report on file, Culture Department Library, Ministry of Small Business, Tourism, Culture, Victoria.

VanStone, James W.

- 1993 Material Culture of the Chilcotin Athapaskans of West Central British Columbia: Collections in the Field Museum of Natural History. *Fieldiana: Anthropology*, N.S., No. 20:1-29.

Waddington, Alfred P.

- 1868 On the Geography and Mountain Passes of British Columbia in Connection with an Overland Route. *Journal of the Royal Geographic Society* 37:118-128.

Walde, K.

- 1996 *An Archaeological Impact Assessment Study of Proposed Forestry Operations Conducted in the Beef Trail Creek, Charlotte Lake East, Kappan/Hotnarko, and Corkscrew Operating Areas in the Chilcotin Forest District*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Will, M., J. Spafford, M. Klassen, and M. Rousseau

- 1997 *An Archaeological Impact Assessment for Riverside Forest Products Limited's Proposed Timber Harvesting Blocks in CP 740, 741, 763, 767, 768, and 772; and Silviculture Treatment Areas in CP 4Y Block 2-3, 11Y Block 2, 84Y Block 2, 88Y Blocks 1-3, and 91Y Block 5 in the Chilcotin Forest District, South Central, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Wilmeth, R.

- 1969a Excavations at Anahim Lake, B.C. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

- 1969b The Potlatch Site, British Columbia: A Preliminary Report. *Newsletter of the Kansas Anthropological Association* 14(7):1-9.

- 1970a Excavations at Anahim Lake, B.C. *Newsletter of the Archaeological Society of British Columbia* 2:2-3.

- 1970b Chilcotin Archaeology. *Canadian Archaeology Association Bulletin* 2:42-43.

- 1970c Excavations at Anahim Lake, B.C. *The Midden* 2(2):2-3.

- 1971a Historical Chilcotin Archaeology at Anahim lake, British Columbia. In *Aboriginal Man and Environments on the Plateau of Northwest America*, edited by Arnoud Stryd and B.A. Smith, pp. 56-69. Calgary Archaeological Association, Calgary, Alberta.

Wilmeth, R.

- 1971b Field Season of 1971 at Anahim Lake. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.
- 1973 1973 Survey at Anahim Lake. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.
- 1975 The Proto-historic and Historic Athapaskan Occupation of British Columbia: The Archaeological Evidence. *Western Canadian Journal of Anthropology, Athapaskan Archaeology*, 5(3-4): 4-20.
- 1977a Chilcotin Archaeology: The Direct Historic Approach. In *Problems in the Prehistory of the North American Subarctic: the Athapaskan Question*, edited by J. Helmer, S. Van Dyke, and F. J. Kense, pp. 97-101. Calgary Archaeological Association, department of Archaeology, University of Calgary, Calgary, Alberta.
- 1977b Test Excavations of the Nukwantlun Site (FdSi 11). Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.
- 1978 *Anahim Lake Archaeology and Early Historic Chilcotin Indians*. National Museum of Man, Mercury Series, Archaeological Survey Paper 82, Ottawa.
- 1979a 1979 Field Work near Anahim Lake, British Columbia. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.
- 1979b An Athabascan Hypothesis. *Canadian Journal of Archaeology* 3:33-40.
- 1980 Excavations at the Nakwantlun Site (FdSi-11): A Report to the Heritage Conservation Branch. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Wilson, I.R.

- 1994 *Archaeological Resource Inventory and Impact Assessment CP946, FL A45024 Gay Lake*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Wilson, M.

- 1983 *Once Upon a River: Archaeology and Geology of the Bow River Valley at Calgary, Alberta, Canada*. Archaeological Survey of Canada, Paper 114. National Museum of Man, Ottawa.

Winram, P., and L. Thomas

- 1977 *Northwest Regional Survey Cariboo Region, Summer 1977*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Yip, A.

- 1996 *Archaeological Impact Assessment of Nu Chugh Beniz and Gwe Da Ts'ih Provincial Campground, and the Fishem Lake Lot on the Chilcotin Plateau*. Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Zacharias, S.

- 1990 *Archaeological Resource Inventory and Impact Assessment at FdSi 1 and Vicinity, Anahim Lake, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.

Zacharias, S.

1994 *Archaeological Inventory and Impact Assessment of Block B, D, L. 404, CDR3, Anahim Lake, B.C.* Report on file, Culture Department Library, Ministry of Small Business, Tourism and Culture, Victoria, B.C.