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Subsistence Change and Emergent Social Inequality in an Early Complex Hunter-Gatherer Winter Village: A Zooarchaeological Assessment of the Bridge River Site (EeRL4), Middle Fraser B.C.

Eric S. Carlson

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Subsistence Change and Emergent Social Inequality in an Early Complex Hunter-Gatherer Winter Village: A Zooarchaeological Assessment of the Bridge River Site (EeRI4), Middle Fraser B.C.

By

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Thesis Paper

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This thesis is dedicated to my father - Lawrence A. Carlson.
ABSTRACT

Carlson, Eric S., M.A., Spring 2010

Anthropology

Subsistence Change and Emergent Social Inequality in an Early Complex Hunter-Gatherer Winter Village: A Zooarchaeological Assessment of the Bridge River Site (EeRl4), Middle Fraser B.C.

Chairperson: Dr. Anna Marie Prentiss

Analyses of faunal material from the 2008 excavations at the Bridge River Site (EeRl4) show that reliance on stored anadromous salmon (Oncorhynchus sp.) remains the primary food staple from early occupations of the village (1550bp) until its abandonment (1100bp), and indeed intensifies through time. Second, taxonomic diversity in food resources declines through time, signifying a diachronic process of resource specialization. The presence of large mammals in the diet, notably deer (Odocoileus sp.), declines through time. Also, while equal distributions of cranial and post-cranial carcass elements are present during early phases of the village, through time they shift to primarily post-cranial elements by the late Bridge River 3 Period. Inferences of local resource depression of such secondarily-ranked resources can be drawn from the data, a plausible outcome for fragile ecosystems supporting a large semi-sedentary human population. It is proposed that by utilizing mass harvesting technology, processing and storage of salmon, and supplemented with roots and deer and a diversity of other food resources, inhabitants of the Bridge River village flourished over their early history. However, the gradual overexploitation of secondary food resources such as deer left the community susceptible when salmon runs failed or fluctuated during a markedly dry period beginning around 1100bp. In contrast, the more productive ecosystem of the Keatley Creek village area, a contemporaneous site in the region, allowed for that community to withstand a decline in salmon numbers by resorting to extensification of secondarily ranked food items, such as deer, other ungulates, medium-sized mammals, and roots. This signifies that each community may have had a different response to shifting ecological conditions, a response determined by their own unique histories.

Additionally, results of increasing variation in the spatial distribution of deer specimens across the Bridge River site suggest late-emerging socioeconomic differentiation (late Bridge River 3 Period). Further, the association of scarce deer elements in the later phases with prestige artifacts suggests the emergence of deer as a prestige food, though not before 1275bp. The growing scarcity of deer coupled with the availability of surplus salmon may be mechanisms through which deer meat may have emerged as a prestige food during the late phases of Bridge River 3 Period, which continued into the ethnographic period, initiating the emergence of a sociocultural institution which associated deer meat and deer hunting with the elite. Deer is the main prestige food during potlatch ceremonies in ethnographic accounts of the Interior Plateau and Coastal groups, and deer hunters and deer stewards exhibited elevated occupational prestige.
“...archaeological understanding of the long term is built up from traces of the smallest and least significant of acts.”  

Ian Hodder (2000:21)

“I am certain there can be no comprehension of the present without the past, just as I am certain the past is not past. And there can be no comprehension of the present without all the tribes, human, animal, floral, and stones, river and dry wash, at the table taking part in the talk.”  

Charles Bowden (2009:18)

1. Introduction

This thesis is designed to assess two interrelated aspects of emergent complex hunter-gatherer societies across the Northwest Coast and Northern Plateau areas of North America: subsistence change and social inequality. Models of culture change have revolved around these central concepts and are seen as critical in explaining the dramatic prehistoric shift throughout the region from relatively small, mobile egalitarian foraging groups to large, sedentary villages often supporting over 1000 inhabitants and exhibiting institutionalized social inequality (Ames 1994; Chatters and Prentiss 2005; Hayden 1997; Matson and Coupland 1995; Prentiss et.al. 2007, 2008). Late prehistoric forms of these complex societies lead directly into the rich and varied ethnographic cultures of today such as the Tlingit, Haida, and Kwakiutl along the Coast (deLaguna 1960, 1972; deLaguna et. al. 1964; Moss et.al. 1989) and the St’át’imc (Upper Lillooet), Shuswap and other Interior Salish speaking groups of the Canadian or Northern Plateau (Hayden 1997; Prentiss and Kuijt 2004; Teit 1906). Often it has been assumed that a combination of climatic change, sea level stabilization, population packing, and technological innovations fostered a new collector-based settlement-subsistence strategy in the region, characterized by a stored anadromous salmon economy and the establishment of larger
and more sedentary villages, thereby setting an inevitable course towards social complexity through the necessary management of larger populations (see Butler and Campbell 2004; Matson and Coupland 1995). Recent publications (Hayden 1997; Kuijt and Prentiss 2004a; Price and Feinman 2005, Wiessner 2002) suggest that such a general and functional explanation is inadequate to account for the particular aspects and individual motivations that such a restructuring of society would require. As Feinman (1995:259) notes, “resource abundance, scarcity, and risk can all create opportunities and stresses. But these factors do not provide a necessary and sufficient explanation for the significant restructurings that characterize the institutionalization of inequality.” Vague explanations attributed to population packing and resultant circumspection, territorialism, sedentism, and risk-reduction strategies (Binford 2001), and/or managerial necessities (Ames 1994) need to be replaced with particular case studies and fine-grained empirical approaches which take into account specific processes of culture change and historical contingencies, in order to determine what precise mechanisms drove such change.

Indeed, explanatory theoretical frameworks which take into consideration aspects of human decision-making (Jochim 1978), the roles of individual agents/practice theory (Bourdieu 1972; Hayden 1995, 1997), society’s willingness to allow institutionalized inequality (Wiessner 2002), and even Darwinian evolutionary explanations which move beyond models of intentionality and directed adaptation (Chatters and Prentiss 2003; Dunnell 1976; Leonard 2001; O’Brien et. al.1998; Prentiss and Kuijt 2004b; Prentiss et.al. 2007, 2008), are needed to expand our thinking beyond mere ecological/functional determinism (Hodder 1982). In the current study, evidence is presented for the emergence of deer meat as an important food associated with prestige and a growing elite
class, a trend which exists into the ethnographic period. Occupational prestige is associated with the hunting of deer and the stewardship of deer hunting territories, and the ownership of deer-hunting fences, ceremonialism, often linked to powerful families. Such occupational status may have its roots in processes beginning as early as 1300 BP at the Bridge River site.

The following study seeks to provide such a fine-grained, detailed assessment of processes which contributed to subsistence change, residential sedentism, and emergent socioeconomic differentiation throughout the region through an analysis of the archaeofauna from the prehistoric Bridge River Site (EeRl4), a well-stratified aggregated winter village comprised of over 80 pithouses located in the Mid-Fraser Region of southern British Columbia, near the modern town of Lillooet. I will argue that throughout the early history of the village, inhabitants of the Bridge River site relied heavily on stored salmon (*Oncorhynchus sp.*), supplemented with a diversity of other food resources. Through time secondarily-ranked food resources such as deer (*Odocoileus sp.*) declined significantly in the diet, and may be a result of localized resource depression. As deer became more scarce in the Bridge River diet, growing variation is seen in its distribution across the site and deer meat comes to be correlated with prestige items such as nephrite adzes and copper ornaments. This data suggests that differential access to deer meat (i.e. emergent inequality), happens no earlier than 1275BP at the site, and is thus a phenomenon that develops throughout the history of the village. Ethnographic sources reveal that deer meat was a prestige food served at potlatches and that deer hunters and deer stewards exhibited occupational prestige
(Romanoff 1992; Teit 1906). This study reveals the process by which this cultural institution may have developed.

The study is presented in 7 chapters. The introduction (Chapter 1) is followed by Regional Background (Chapter 2) which consists of physiographic, paleoenvironmental, the Bridge River environment, and flora and fauna subsections. A cultural context is presented in Chapter 3, comprised of prehistoric and historic context subsections, a St’át’imc ethnology, and a discussion of the natural characteristics and cultural importance of the three main food staples of the traditional St’át’imc people: anadromous salmon, deer, and roots. Theoretical perspectives are presented in Chapter 4, including sub-section discussions on complex hunter-gatherers, resource intensification, and egalitarianism and social inequality, with a review of previous research conducted at the Bridge River Site and details of the current excavations conducted at the site by the University of Montana. Analysis is presented in Chapter 5, and is comprised of research hypotheses and methods subsections. A discussion of the findings is presented in Chapter 6. Conclusions are presented in Chapter 7.
2. Regional Background

2.1 Introduction

The following chapter details the physiographic and paleoenvironmental background of the Mid-Fraser region. A bio-environmental and geographic assessment of the Bridge River Site locality, including local flora and fauna, is then presented.

2.2 Physiography

The Mid-Fraser Region, where the project area is located, is roughly delineated by the rugged environs bordering the Fraser River between the modern towns of Lytton, and Cache Creek, British Columbia (Figure 2.2.1). It is situated within the larger geographical and culture area designation known as the Canadian Plateau (Northern or Interior Plateau) encompassing an area of south-central British Columbia bounded on the west by the eastern flanks of the Coast/Cascade Range and on the east by the Rocky Mountains. Burns Lake and Prince George define its northwest and northeast corners, respectively, while the southern boundary is located 15km north of, and parallels the international border (Rousseau 2004). Although dominated by
arid mountainous terrain, precipitous slopes and valleys deep and narrow (Chatters 1998),
great natural diversity in land and food resources are present, ranging from boreal
subarctic zones predominated by spruce forest of central British Columbia, to basin and
range province in the south. It is characterized by Chatters (1998:9) as “…an ever-
changing mosaic of habitats for human beings and the resources upon which they
depended.” Cultural groups throughout the Northern Plateau share a common focus on
anadromous salmon, deer, and root crops as primary subsistence items (Walker 1998).
These resources often determine settlement patterns and help form aspects of religion and
even social identities amongst the Plateau peoples. The common language spoken
throughout the Northern Plateau is Interior Salish, which is in the same linguistic family
as Coastal Salish speakers from the Gulf of Georgia Region. Sahaptin is spoken by
cultures in the Southern Plateau and Kootenai, a language isolate in the Algonquian-Wakashan phylum, is spoken at the eastern extremes of the Plateau (Kinkade et. al 1998). The Chilcotin, who border the study area to the north, speak an Athabaskan tongue. The Northern Plateau has been defined as an ethnoscape/interaction sphere characterized by intensive contact and sharing of cultural/social knowledge between groups (Rousseau 2004; Hayden and Schulting 1997).

The aridity of the region is a result of the rain-shadow (or orographic) effect created by the Coast Range. Here, easterly flowing moist weather fronts generated in the Pacific Ocean, particularly the Aleutian Low pressure system and the Subtropical Pacific High, are effectively slowed by the high mountains along the coast and pushed upwards in elevation where they are cooled and release moisture in the form of rain or snow. This results in significant rainfall in the coastal environs on the western side of the mountains and dry conditions on the east, where the project area is located. Dry and cool Continental air masses flow into the Northern Plateau from the Arctic, further contributing to arid conditions. The resulting climate in the Canadian Plateau consists of unusually warm dry summers, and severely cold winters. Annual rainfall in the Plateau is 30-40cm (Chatters 1998:32), and 31.5cm in Lillooet (Ryder 1978). For comparison, on the western side of the Coast Range yearly rainfall is 345cm in the Vancouver area. Lillooet receives most of its moisture in the form of high mountain snow during the winter, which then melts throughout the summer months to feed the drainages of the lower valleys. June usually experiences heavy rain, but abruptly gives way to hot-dry temperatures in July and August.
The rugged topography of the Canadian Plateau is a result of a combination of past geologic processes which include most saliently, the dynamics of Cretaceous mountain-building and subsequent uplift events, later molded by Pleistocene glaciation, and post-glacial erosional down-cutting. The 95 million year old collision of the Wrangellia terrane and the Western edge of North American continental plate caused the folding, thrusting, and uplift of metamorphosed granitic rock resulting in a mountainous geologic zone known as the Coast Belt, extending, from coastal southeast Alaska to Central Oregon (1000km) and inland 100-200km (Mathews and Monger 2005). Subsequent lateral slide-cut faulting and overlaying of volcanic deposits have contributed to more extreme topography of the southeastern Coast Range, within which the project area is located. The generally north-south trending Fraser and Yalakom faults cross through the Lilooet area, forming the boundary of Coast and Intermontane Belts. The Bridge River terrane forms the west side of the Fraser River Valley today and is comprised of Carboniferous to middle Jurassic ocean floor basin, overlain by late Jurassic and early Cretaceous marine sandstone and shale (Mathews and Monger 2005:95). Methow terrane forms the eastern flanks of the Fraser Valley near Lilooet and consists of Permian oceanic crust, on which were deposited marine and mainly arc-derived shale, sandstone, and conglomerate of Mesozoic age (Mathews and Monger 2005:95). Local outcrops of dacite, shale, basalt, ochre, limestone and chert were important minerals utilized for functional and social/ceremonial reasons by the Lilooet Indians (Hayden 1997; Teit 1906). A natural belt of serpentine greenstone or nephrite important for adze making and prestige display (Teit 1906), occurs in the Pavilion Range,
extending from Seton Lake area north into the Bridge River valley (Clark 2005; Mathews and Monger 2005).

The topography of the Coast Belt was later sculpted by glacial movements of the Cordilleran ice sheet during multiple glacialiations throughout the Wisconsin Glaciation (75,000bp to 11,000bp) (Fulton 1984), the latest ice age in which global temperatures dropped to 10-15 degrees C below today’s temperature means (Gastes 1976). Deep valley cutting and smoothing by glaciers was especially extensive along the western edge of the Coast Range below 2000m, where ocean moisture generated the thickest and fastest moving icesheets (Choquette 1991). Dramatic fjords, long narrow fractilian topography along the British Columbia and Southeast Alaskan coasts is evidence of the effects of glacial sculpting. Lobes of the Cordilleran sheet also extended east into the Canadian Plateau, following localized valleys. By the late glacial maximum (18,000-15,000bp), ice sheets covered all of British Columbia and the southern Yukon to depths of 2450m, and extending north into the Wragell-St.Elias Range of southern Alaska. At this time, the Cordilleran ice sheet fused with the Laurentide ice sheet of eastern Canada, effectively covering all of Canada with the exception of pockets of ice-free refugia along the western Pacific coast (Dixon 1999). Choquette (1991), however, emphasizes the variability of the Cordilleran Ice Sheet east of the Coast Range during the Pleistocene, and calls on the cessation of viewing all of southern BC as covered in one massive glacier. The latest localized glaciation of the Mid-Fraser region is called the Fraser Glaciation (30,000-10,000BP).

Glacial movements are responsible for depositing massive amounts of glacial till and creating extensive moraines and complex drift benches within the Canadian Plateau.
The U-shaped valleys within the study area (Seton lake, Lillooet Valley, Bridge River Valley) and valley benches comprised of depositional till are testament to the eastwardly flowing glacial forces. Craggy spires of granitic stone on the highest mountain peaks such as Mount Brew reveal some of the only landforms above the thick glaciers.

Warming trends and subsequent deglaciation between 15,000-11,000bp further affected the geomorphics of the Lillooet area. The highest peaks were exposed first and rapidly carved through downwasting, while glacial tongues remained in the valley bottoms, including the Bridge River and Fraser valleys. Catastrophic events such as ice dam bursts and flooding episodes were common during this period and contributed to the morphology of the region. By 11,000bp, the Lillooet region was completely free of ice (Ryder 1978:63).

During the early Holocene, subsequent rapid erosion of the landscape occurred as global temperatures warmed as much as 5 degrees Celsius (Clague and Mathewes 1992). Rapid melting of ice sheets caused massive alluvial downcutting especially within the Fraser River valley and the Bridge River Valley, resulting in the formation of benches along canyon walls later utilized for Late Prehistoric villages. Waterflow processes re-worked and sorted glacial depositions throughout the Holocene. Mass wasting events, slope failures such as landslides and surface creep are signs of continued postglacial settling and stabilization processes. The region is currently experiencing degradation of the sediments through continued river downcutting.

Relatively current geologic events continue to have profound consequences for the Lillooet area of the Mid-Fraser. Two catastrophic landslides occurred within the Fraser Canyon, 16km south of Lillooet. The first occurred sometime between 5000 and
2000 BP at Texas Creek. Seventy-four million cubic meters of granitic shale slide from the western slope of the Fraser River into the canyon bottom (Mathews and Monger 2005). A second slide releasing 4 million cubic meters from the canyon wall occurred at the same location at 800 BP. Both of these slides were large enough to block the flow of the Fraser for an indeterminate time, and, according to (Mathews and Monger 2005), resulted in the flooding of the Lillooet Valley and multiple other valleys upriver, including Bridge River. The large lakes which are believed to have formed from the two slides resulted in the deposition of silts within the Lillooet Valley, adding to the extensive terraces and river benches. Eventual release of the backed-up water into the Fraser Canyon downstream of Texas Creek caused rapid erosional scouring producing deep and narrow canyons. Valley floors upstream, extending north of Lillooet to Fountain Creek on the Fraser, remained relative wide and shallow in comparison.

Slide events such as these would be catastrophic to anadromous salmon populations which need to pass through the Lillooet area in order to spawn in high mountain lakes and small tributaries. Hayden (1997) attributes the collapse of Late Prehistoric villages in the Middle Fraser Region to the destruction of the salmon economy caused by the second slide at 800bp (see Kuijt 2001; and Kuijt and Prentiss 2004 for counter view). Importantly, the Texas slides reveal the dynamic, often fragile interrelations between the environment, natural food resources, and human populations in the Mid-Fraser. Indeed, fluctuations in the natural environment, including salmon abundance, deer populations, and natural root productivity are the natural order of things in the region.
2.3 Paleoenvironment

Post-glacial environments in the Northwest Coast and Interior Plateau reflect shifting climatic regimes, trending generally from cold erratic episodes prior to 11,000bp to warmer, more stable patterns post 11,000bp. Cold and moist post-glacial environment 15,000-11,000bp supported tundra-like conditions, dominated by heath, lichen, moss, and grasses with groves of birch, similar to the present day Engelman spruce-subalpine fir biogeoclimatic zone (Krajina 1965). Fauna included Pleistocene animals such as mammoth, horse, and ground sloth, as well as a variety of smaller mammal and avian species.

Studies of pollen, glacial geology, fossil timberline reconstructions, rates of rock spall deposition in caves, and indirectly from vegetation distributions, indicate that four marked climatic transitions occurred following the Late Pleistocene (Chatters 1998:43). These transitions are covered below (Table 2.3.1):

11,000bp to 9500bp – These years are the warmest and driest period of the Holocene with years marked by cold, dry winters and hot, moist springs and summers. Regional flora was dominated by grasses and other steppe plants. Open pine, fir, and juniper forests existed only in small patches above 1,300m elevations. Fauna included elk, bison, deer, big horn sheep, and pronghorn. Now extinct species include *Bos antiquus*. By 11,000bp, glacial ice had melted from all but the highest peaks.
9,500bp to 6,400bp - This period marks the beginning of an increase in precipitation. Forests show a downslope shift, with open Ponderosa pine and Douglas fir forests replacing the earlier grasslands. This trend is possibly the result of a shift from continental to maritime climatic patterns, characterized by warmer, wetter winters. Cedar forests dominated the Fraser Canyon at this time. 7800 to 7500bp sees a dramatic shift in the flora as a result of the eruption of Mt. Mazama, and subsequent ash fall, no doubt resulting in the deaths of many humans and animals in the Northern Plateau.

6,500bp to 4,500bp – This period sees widespread warming of the region and an increase in effective moisture and vegetation densities. Forest understories of grass are over-come by dense forests of Douglas fir and pines, continuing the trend of forest expansion from the last period. Drainages experience increased frequencies of flooding, and later spring freshets, resulting in more productive salmon fisheries and increased berry production (Chatters 1998:47).

4,500bp to 2,800bp - Climate abruptly cooled beginning at 4,500bp and remained very wet throughout this period. There is a sharp decline in river temperatures, and increased spalling in rock shelters hints at colder winters (Chatters 1998). Douglas fir forests in the Fraser Valley reach their maximum density (Chatters 1998:45), and even encroach into the open lowlands in the southern Plateau (first and only time). Rivers and streams were generally clear and cold with gravel bottoms, while spring freshets occurred later and lasted longer than any other time. Such conditions were perfect for anadromous salmon production, “resulting in short, spectacular runs” (Chatters 1998:48). Climate at
this time was the coldest and wettest of the Holocene, with possibly 30% more moisture than historic averages (Mehringer 1985). Terrestrial game production, however, was at its minimum especially in the north and east due to closed forests, and short productive seasons.

2,800bp to present – This period sees a warming trend between 2,800 and 1,900bp, and the establishment of modern vegetation distributions. Subalpine forests retreated upwards in elevation, opening up lowlands once again. Forests also became less dense, and increased forest fires may have elevated big game populations. Dense shrub steppe was overcome by bunch grasses. There is evidence that the region experienced severe drought and summer-only precipitation. Extreme siltification and warming of streams and rivers contributed to lower salmon productivity. There is little evidence of major environmental change in last 2000 years. Even the Little Ice Age (AD1400-AD1840) had little impact on flora of the region.

The three main dietary staples of peoples across the Plateau, salmon, deer, and geophytes (Chatters 1998; Hayden 1992b), were greatly impacted by even the slightest of climatic variation. According to Chatters (1998), aboriginal food resource productivity varied according to two dimensions of climate: effective moisture and temperature. Changes in moisture effect density of forest/steppe environments in turn effecting resource patches within. Foraging areas are expanded from forest retraction during times of decreased moisture. Also, dry conditions result in less vegetation cover flanking riverine areas, increasing the amount of silt entering drainages and warming the water,
both detrimental to local fish populations. Temperature affects the relative length of warm and cold seasons, specifically longer winters mean less productivity of forage in the warmer parts of the year, affecting abundance and distribution of other animals reliant on the forage (Chatters 1998:46). Warmer conditions allow game animals to spend more time in the highlands, and are thus more dispersed, and more difficult to hunt. Salmon are adversely affected for a variety of reasons. Warm waters increase risks of bacterial growth on adult salmon and fungal growth on spawned eggs. Secondly, it produces an earlier, shorter freshet diminishing the out-migration success of young trying to reach the ocean. In contrast, colder conditions result in more condensed, intense, and predictable spawns of anadromous salmon. There is a narrower window in which spawning conditions are favorable, a characteristic of northern salmon streams (whereas spawning streams to the south are characterized by a wider spawning window and subsequently a less concentrated frenzy of reproduction).

Table 2.3.1 Summary of paleoclimate and effects on certain food resources. (based on Chatters 1998).

<table>
<thead>
<tr>
<th>Period</th>
<th>Climatic Conditions-Effect on Salmon/Deer/Geophytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,000bp to 9,000bp</td>
<td>Following Younger Dryas. Warm and dry; grasses and other steppe plants prevail</td>
</tr>
<tr>
<td>9,500 to 6,400bp</td>
<td>Increase in precipitation; expanding forests</td>
</tr>
<tr>
<td>6,400bp to 4,500bp</td>
<td>Continued warming and increased moisture</td>
</tr>
<tr>
<td>4,500bp to 2,800bp</td>
<td>Abrupt cooling and very wet; perfect salmon conditions (intense and spectacular runs); dense forests; peak Neoglacial period</td>
</tr>
<tr>
<td>2,800bp - present</td>
<td>Warm and dry; lower salmon productivity; high root productivity; siltification of streams (Little Climatic Anomaly 1250-700; Little Ice Age: 700-200bp)</td>
</tr>
</tbody>
</table>

The period between 1550 BP and 1200 BP, roughly the dates of the early BR 2 Period occupation of the site, would have seen moderate productivity in the numbers of spawning salmon reaching the Mid-Fraser Region. Warming trends beginning during the Little Climatic Anomaly (1250-700 BP) are believed to have resulted in an abrupt decline in salmon productivity. Warmer water would have resulted in increased fungal and
bacterial growth, and increased slope erosion would have added sediment to the streams and rivers. Conversely, warmer, drier environment especially in late summer would have been ideal for the successful wind-drying of salmon.

It is important to note that subregions of the Plateau were affected differently by climatic changes - as one area was experiencing a decline in productivity another may have been increasing. In cultural terms, all resource fluctuations are local (Prentiss, personal communication). For example, Alexander (1992) emphasizes the poor resource abundance of the Bridge River Valley in terms of deer populations, while the Pavillion area near Keatley Creek village has abundant ungulate resources. There exists in the regional environmental history a shifting balance between ideal conditions for terrestrial and aquatic resources.

2.4 Bridge River Village Environment:

Bridge River site area is located on a discreet narrow terrace comprised of Quarternary deposited glacial till above the north side of Bridge River, approximately 5km upstream from its confluence with the larger Fraser River (Figure 2.4.1). A steep granitic exposure of the Camelsfoot Range (3000m) rises dramatically from the north edge of the site. Equally extreme terrain of the Pavilion Range (2000m) rises up out of the southern edge of the river drainage. These mountains define a long narrow valley rising westerly into the Coast Range, spotted with lakes and a lusher environment at its higher elevations. Peaks of the Clear Range are visible to the east, flanking the east side of the Fraser River Valley. The Fraser Valley is a deep winding trench flanked by
high mountains, and steep slopes rising 1500-1800m out of the drainage (Ryder 1978:56). Access to the Fraser River is limited to a few places in which natural rock outcrops extend into the water. Not surprisingly, prehistoric communities are clustered in these areas (Rousseau 2004, Hayden 1997), ensuring access to abundant salmon runs. The lower slopes of the Fraser River Valley and Bridge River Valley are comprised of extensive benchlands of glacially-deposited till many meters thick and overlain by thin deposits of aeolian (or wind-blown) fine sand and coarse silts. Alluvially deposited fans of fine silts and clay from side drainages overlay the bench forms as well. Valley side-slopes above the benchlands are mantled by ground moraine or colluviums, or consist of bedrock outcroppings and talus slopes. Rubbly colluvial material covers steep forest slopes which is often underlain by the glacial till.

Figure 2.4.1. Aerial photograph of the Bridge River Site (EeRl4). (From Google Earth.com).
Figure 2.4.2. Aerial photograph of 6-Mile Rapids (Sxetl). (From Google Earth.com).

The clear water of the Bridge River empties into the Fraser River east of the site at the confluence known as Sxetl, or 6-mile Rapids, six miles north of Lillooet B.C., and is the most productive fishery in the Northern Plateau (Romanoff 1992). Teit (1906) talks of the cultural importance of Sxetl during the spring runs of Chinook (Onchorhynchus tshawytscha) and the late August sockeye (Onchorhynchus nerka) runs. Aboriginal groups from across the region would congregate at the rapids to mass-harvest, process, and wind-dry salmon. It was also an important location for trade, settling disputes, and marriage proposals (Fraser 1960; Teit 1906). Today at 6-Mile Rapids indigenous people still practice traditional dip-netting and gill-netting, and wind-drying racks cover the cliff edges above the raging waters of the river.

Bridge River valley is currently dominated by a bio-environment known as Ponderosa Pine-Bunchgrass zone (Krajina 1965:8-15) characterized by an open and
semi-open forests forest of ponderosa pine (*Pinus ponderosa*) with a shrubby or herbaceous understory, and by semi-arid areas of bunch grass, sagebrush (*Artemesia tridentata*), and bitter brush (*Purshia tridentata*), all on glacial till (Krajina 1965). Additional dominant plant species in the study area include vine maple, cottonwood, and huckleberry and saskatoons, chokecherry, lodgepole pine, snowberry, bitterbrush, big sagebrush, Idaho fescue, blue wildrye, bluebunch, and wheatgrass. Edible plants include balsamroot, wild onion, yellowbells, salsifies, and *triteleias*. Stands of quaking aspen, serviceberry, chokecherry, hawthorn, dogwood are present in the riparian zone. Krajina (1965) characterizes all of the Fraser Plateau as one dominated by Cariboo Aspen-Lodgepole pine biogeoclimatic zone - a species-poor forest typical of environments exhibiting harsh extremes of cold winters/hot summers. Today, the Lillooet region experiences hot and dry summers and cold winters. Average temperature in January is 20 degrees Fahrenheit while July and August see this temp 90 degrees Fahrenheit. Precipitation is highly seasonal, with most moisture accumulating in the winter as snow, then a wet month in June with fall dry periods.

The Mid-Fraser region is comprised of seven sharply demarcated environmental units, “each of which are internally uniform in terms of culturally important resources” (Alexander 1992:47) contributing food and natural resources/social concerns to land-use patterns of aboriginal inhabitants (Hayden 1992b). Based on work of Krajina (1965, 1969) who uses climate as a parameter to define unit and (temperature and rainfall for more refined “zone” designations, the seven environmental units include: 1) alpine, 2) montane parkland, 3) montane forests, 4) intermediate grasslands, 5) intermediate lakes,
6) river terraces, and 7) river valleys. Each characterized by variation in physical geography, climate, and seasonal abundance of important traditional food items.

2.5 Flora and Fauna:

“In discussing the flora and fauna of the region, it is important to emphasize not only their presence or abundance, but to consider their seasonal migration patterns, seasonal availability/recognition, etc. for it is this variation in abundance and availability that has resounding significance in how pre-historic peoples in the Mid-Fraser organized their communities, social relations, and practiced subsistence patterns.” (Hayden 1992b:15)

**Flora:** A wide diversity of plants are found in the Mid-Fraser, often determined by the environmental zone. The Bridge River Village, considered to be in the River Terrace zone (Alexander 1992), supports Ponderosa Pine and lodge pole pine floral environment with an understory of shrubs. Riverine environment below the site includes cottonwoods, vine maple and alders. Upper mountain environments dominated by lichen, spruce, etc. Traditional plant foods within this environment include roots, nodding onion, balsam root, mariposa lily, glacier lily, western spring beauty, bitterroot, tiger lily, to name the highest-ranked species (Lepofsky and Peacock 2004). Berries include Saskatoon, black huckleberry, red raspberry, wild strawberry, chokecherry, and soapberry to name the highest ranked. Other important foods include greens from balsamroot, fireweed, thimbleberry, cow parsnip, and pricklypear cactus. Pine nuts, hazelnuts, and seeds of balsamroot also utilized; as was tree cambrium from ponderosa and lodge pole pines, cottonwoods, spruce and pine.
**Fauna:** The Mid-Fraser currently supports a wide diversity of species, indeed one of the more diverse areas of the West (Chatters 1998). The Plateau supports typical north temperate mammalian fauna, which includes nine species of ungulates. Deer and elk occur in groups, particularly in winter, and then move to lower elevations to avoid deep snow (Wallmo 1981). Large mammals include elk, moose, white-tail and mule deer, big horn sheep, mountain goat, brown and black bears. Medium sized mammals include beaver, fishers, marten, wolf, coyote, wolverine, weasel, porcupine, marmot, and rabbit. Small mammals include a variety of mice, shrews, voles, ground squirrels, tree squirrels, etc. In addition to subsistence, these species also provided skins and hides for clothing and bedding, bones for tools, teeth for carving tools, claws for pendants, and other items for prestige display. Four species of anadromous salmon occur in the region including Chinook, coho, sockeye, and pink. Sturgeon, white fish, and various species of trout are also present. Local bird species include spruce grouse, ptarmigan, raptors, and waterfowl such as ducks and geese. Amphibians include a variety of toads, frogs, and lizards.

3. Cultural Context

"The culture history of the Canadian Plateau during the last 7000 years is characterized by a remarkable series of social, economic, technological, and behavioral achievements and transitions. From early big game hunting, to opportunistic foraging, and on to the eventual emergence and intensification of logistical collecting..." (Rousseau 2004:21)

3.1 Introduction

This chapter contains a detailed prehistoric context followed by ethnographic data on the St’át’imc (or Upper Lillooet) Indians, descendents of the late prehistoric peoples of the
Mid-Fraser (Hayden 1997; Kennedy and Bouchard 1978; Teit 1906). Attention is focused on aspects of St’át’imc subsistence activities including their seasonal round, and the cultural significance of salmon, deer, and roots, main staples of their subsistence economy. Equally important is the establishment of a context for a discussion on social organization, including an assessment of mechanisms used to establish and maintain prestige, status inequality, and at the least, socioeconomic differentiation. Important in this discussion is the awareness and defining of an ancient and sustained foraging pattern based on high residence mobility, small groups, and egalitarian social organization, which dominated the prehistoric cultures of the Middle Fraser for nearly 6000 years (10,500-4500bp). The foraging lifeway, indeed, has been the predominate way of life for the history of humanity as a whole, a span of two million years (Bettinger 1987; Hayden 1997). Assessing the region-wide transformation of such a long-established way of life in the Mid-Fraser, including the supplanting of deep-seated social institutions for maintaining egalitarianism, to a new pattern which saw the intensification of a salmon-based economy, and the formation and maintenance of large aggregated villages are themes of this study.

3.2 Prehistoric Context:

Human colonization of the Americas is believed to have occurred by foraging groups originating in eastern Siberia from such sites as Dyuktai and Ushki who crossed over the Beriginian Land bridge into Interior Alaska around 13,000bp (Hoffoeker and Elias 2009; Matson and Coupland 1995). These early groups are believed to have later
bifurcated, with one subgroup traveling southeast into what is today Southeast Alaska by 10,500bp (Ackerman 1968; Dixon 2001; Fladmark 1979; Matson and Coupland 1995). The other group is believed to have continued east and south through interior Canada via the ice-free corridor, and emerged into the High Plains. Here new adaptations lead to the development of the Clovis culture by 12,500 B.P., a highly mobile “high tech foraging” adaptation focused on the hunting of big game, including mammoth and *Bos antiquus*, which utilized a unique tool kit including fluted spear points. An alternate coastal route for colonization has been proposed by Dixon (1999,2001), Erlandson (2006), and Fladmark (1979), and is gaining acceptance as more early sites are discovered.

**Paleoindian Period: (10,000-8,000 BP)** The first evidence of human occupation on the Canadian Plateau occurs during post-glaciation, circa 10,000 BP (Rousseau 2004). This period follows the recession of the Cordilleran Ice Sheet which had covered the entirety of British Columbia during the Late Glacial Maximum (17,000 BP), excepting a few isolated coastal refugia. The earliest inhabitants of southern British Columbia survived in a tundra-like environment and practiced a highly mobile settlement pattern, relying on a range of food species from mammoth, bison, musk oxen and other megafauna, to squirrel, rabbit and migratory waterfowl (Fladmark and Alexander 1985). Paleoindian peoples in the region possessed a unique tool kit which consisted of bifaces exhibiting collateral flaking, and basal grinding; large unifacial scrapers; large expanding flake tools; and burins. Cache-mounds of frozen meat and bones often marked with mammoth tusks were situated throughout a group’s foraging area. Multiple Clovis sites are found south of the project area and include East Wenatchee Clovis cache (11,000 BP) in eastern...
Washington, the Simon Cache and Jaguar Cave in Idaho, Connley Cave, Cougar Mountain, and the Dietz sites in Oregon, and the Anzick site in Montana. Paleoindian sites to the east are concentrated in the Peace River Valley, and Rocky Mountains of western Alberta.

Two sites of note located near the project area are Charlie Lake Cave and Vermillion Lake. Charlie Lake Cave (Fladmark and Alexander 1985), situated in an upland environment northeast of the Lillooet area in the Peace River Valley, contained a fluted point, microblades, a stone bead and a diverse faunal assemblage that included ground squirrels, arctic hares, and migratory waterfowl. This site may be evidence of a northern migration by post-Clovis paleoindian peoples. Contemporaneous sites east of Charlie Lake Cave reveal a subsistence strategy focused more on the hunting of large game such as mammoth, equids, camel, elk, musk oxen. Pollen analyses from the site reveal a dynamic climate in which a tundra environment dominated by shrubs, mosses, grasses, and sedges (12,000 to 11,700 B.P.) gave way to a deciduous tree-shrub-herb assemblage (11,700 to 11,300 B.P.) (White 1983). Following this was the establishment of patches of coniferous forests dominated by spruce and pine trees by 10,500 B.P.

Vermillion Lakes (Fedje et. al. 1995) (10,800-9,000 B.P.) is a multicomponent site exhibiting Clovis-like and Early Stemmed Point Tradition assemblages. The site contains evidence of a possible shelter or windbreak as well as multiple hearths and stone cooking slabs (Fedje et al. 1995). Wedge-shaped microblade cores are present suggesting Denali Complex antecedents. Inhabitants of the site practiced a selective subsistence strategy which targeted bighorn sheep, with notable shifting strategies in animal procurement through time. Lithic tools include large chopping tools as well as large
lanceolate-shaped bifaces and stemmed points. Fedje et al. see similarities with the Goatfell Complex of the Kootenai area south of the project area. These trait similarities include a “…preference for fine-grained siliceous sedimentary stone… a lithic technology oriented primarily to production of large expanding flakes with low angle striking platforms and large bifacial cores and a tool kit dominated by large bifaces, large discoidal unifaces, and large unifacial flake tools,” (Choquette 1982).

Matson and Coupland (1995) define a later Protowestern Complex throughout the interior Northwest Coast, including the Canadian Plateau, that is known for a variety of large stemmed/lanceolate points considered derivatives of the Clovis tradition. These groups show an adaptation to Pleistocene lakeshore environments, and are possibly associated with Western Pluvial Lakes Tradition of the northern Great Basin. The Marmes Rockshelter in southeastern Washington contains Windust Culture deposits with dates ranging from 10,500bp to 9000. Subsistence patterns at these sites show a shift away from reliance on big game and a general broadening of the diet to include a variety of smaller mammals, fresh water mussels, fish and birds (Matson and Coupland 1995). There is evidence that paleogroups from the Northern Plains such as Agate Basin, and Foothills Mountain complex peoples may have also penetrated the area.

Two distinct regional foraging traditions eventually emerge in the Northwest Coast and Northern Plateau areas derived from the Paleoarctic Tradition which significantly influenced subsequent adaptations within the project area. These are the North Coast Microblade Tradition (NCMT) and the Old Cordilleran tradition. NCMT has antecedents in the Dyuktai and later Denali Complex populations from interior Alaska and was situated in the northern Northwest Coast, in what is now Southeastern Alaska.
Characterized by a microblade-based technology and high residential mobility, people lived in small groups of between 25-40 individuals, exploited a variety of coastal resources and terrestrial mammals. Evidence of their high mobility may be drawn from the fact that no shelters have been located in the archaeological record.

The Old Cordilleran Tradition, as defined from such sites as Glenrose Cannery (Matson 1976) and Bear Cove (Carlson 1979), was focused along the lower Fraser River near the Gulf of Georgia, and extended up the Fraser as far as the Milliken site near the project area. Old Cordilleran is characterized by a pebble tool dominated lithic assemblage. Sites are situated on terraces above the lower Fraser and subsistence combined the hunting of large terrestrial ungulates and marine mammals with pelagic and anadromous fish resources.

What follows is a culture-chronology of the Middle Fraser region from 7000bp to Contact (200bp) based primarily on the work of Richards and Rousseau (1978), Rousseau (2004), and Prentiss et al. (2005). The Mid-Fraser chronology follows broader regional trends encompassing much of the Northwest Coast and Plateau culture areas. Two cultural traditions define the Mid-Fraser transition from generalized foragers (as per Binford 1980) to complex collectors practicing logistically organized collecting, use of storage, and semi-sedentary residence in large aggregated winter villages: the Nesikep and Plateau-pithouse traditions, each is further sub-divided into phases and horizons.

**Nesikep Tradition: (7,000-3,500bp):** As originally defined by Sanger (1969,1970), and later refined by Stryd and Rousseau (1996), the Nesikep tradition acquires its earliest
dates from the Lehman site, Zone II, though there are possible earlier pre-Mazama dates (c.a.8,500 BP) for the Landels site (Rousseau 2004). Nesikep peoples are characterized by small, highly mobile groups of foragers practicing a wide diet breadth, though the hunting of large ungulates and acquisition of trout and anadromous fish resources were of primary importance. Nesikep groups maintained low population densities and resided within a relatively warm and dry climate with abundant and predictable food resources. Tool technology is dominated by microblades and large, well-made bifaces. Nesikep tradition is subdivided into the Early Nesikep Period, the Lehman phase, and the Lochnore Phase (as per Prentiss and Kuijt 2004b).

**Early Nesikep Period (7,000-6,000bp):** This period represents “highly mobile, hunting/gathering/fishing, opportunistic forager-type adaptive strategy that developed *in situ* as a unique and widespread Canadian Plateau cultural and archaeological entity by at least 7000bp and possibly earlier,” (Rousseau 2004:8). Small groups lived in residential camps occupied for only a few days or weeks, often located on sandy river terraces at river confluences and often near salmon fisheries. Field camps are found in all environmental zones and altitudes signifying high residence mobility.

Tools of the Early Nesikep Period, which include micro-blades and well made large lancelote-shaped bifaces exhibiting high multifunctionality and flexibility, are indicative of extremely mobile groups. Sophisticated technical skill is exhibited in both common tool types. Micro-blades are thought to have been introduced from central or southern Northwest Coast regions as early as 9000 or 10,000bp (Carlson 1983), and are common to mobile groups practicing a basic opportunistic foraging strategy, especially in
regions where little good-quality stone was immediately available. The eruption of Mt. Mazama (6,800bp) and subsequent ash fall in the region no doubt had profound effects on large mammals and humans, as well as potentially decimating salmon populations (Rousseau 2004).

*Lehman Phase (6,000-4,500bp)*: This phase is based primarily on Rattlesnake Hill and Oregon Jack Creek sites near Ashcroft, as well as others in the Highland Valley. Similarities in technology, subsistence practices, lithic tool repertoires and radiocarbon dates reveal a continuation from the Early Nesikep Period (Rousseau 2004:9). A continued drier and warmer climate with vast grasslands and even desert in the valley bottoms, supported reliable and abundant ungulate and small mammal food resources.

Settlements are commonly found on river terraces and are usually small, short term deeply buried containing medium to high density scatters of lithics, bone, and freshwater mussel shell. Stratified layers suggest long hiatus between revisits. Low site densities and small site sizes indicated low regional population. However, slow gradual population increase does typify the period. These highly mobile, egalitarian groups are believed to consist of 25-30 members, with no more than 100 total people in the Middle Fraser Region (Rousseau 2004:10). No pithouses are found from this period, probably obviated by warm weather.

Lehman phase groups practiced generalized broad-spectrum opportunistic foraging, with elk and deer being preferentially targeted. Salmon increased as a food resource after 5000bp. Trout, an easy highland elevation protein source, was harvested at
narrow on channels between lakes. or in gravelly sections of smaller streams. Such fishing locations exhibit many microblades.

The material culture is characterized by obliquely notched bifaces and the common use of dacite (vitreous fine-grained basalt), and various cryptocrystalline silicates from non-local sources such as Arrowstone Creek, Cache Creek, Hat Creek, and Maiden Creek.

**Lochnore Phase (4,500 – 3,500 bp):** This terminal period of the Nesikep sees significantly cooler and wetter conditions corresponding with a major Neoglacial event that later climaxed around 3300bp and ended at 2500bp, with major impacts on the regional environment, ecosystems, and cultural patterns (Hayden 1997; Kuijt 1989; Kuijt and Prentiss 2004; Prentiss and Kuijt 2004b). The Lochnore settlement pattern is characterized by relatively small hamlets situated in areas of rich and diverse resources. Inhabitants utilized primarily broad spectrum opportunistic foraging subsistence strategy which included deer, elk, waterfowl, beaver, migratory fowl, freshwater mussels, among others. As noted above, many see this trend as a result of ideal climatic conditions in which cold wet climate expanded forests, increasing biological carrying capacity therein. No storage facilities are known from this time and there is no evidence for intensified harvesting of anadromous fish resources, though Rousseau (2004) suggests that some drying and storage of salmon and roots was surely possible. Groups are still considered foragers, though logistical collecting is being experimented with.

Residential and field camps are often located on edges of upper river terraces and along the sides of main river valley bottoms, often at confluences with smaller drainages.
Field camps are also at times situated in mid-valley contexts beside small lakes and streams for short periods of time and occupied by 10-20 individuals.

Material culture includes Lochnore side-notched points with convex bases, end scrapers, concave-edged scrapers, micro-blade technology, edge-battered, ground and abraded cobbles, pebble tools/choppers, predominant use of local dacite, antler wedges/points/worked rodent incisors, drilled animal tooth and eagle clay pendants. Barbed points and marine shell beads attest to interaction with Charles Culture peoples of the Lower Fraser coastal area (Matson and Coupland 1995).

Wedge-core microblades exit the region abruptly at 3500 BP, possibly a result of increased semi-sedentary settlement patterns and subsequent acceptance of lesser quality but local materials for expedient stone tool manufacture (Rousseau 2004), signifying the end of high mobility and opportunistic foraging. The end of the Nesikep period sees the possible abandonment of the region and the later incursion of Coastal groups or at least their technologies penetrating the area (Prentiss and Kuijt 2004b), characterized by the growing reliance on stored food, and scheduled seasonal resource exploitation, i.e. collector-based pattern.

**Transition from Lochnore to Plateau-Pithouse Tradition: (3500-3000 BP):** This transition period sees the emergence of the first collector-based economies in the Middle Fraser Region, characterized by semi-sedentary pithouse hamlets, food storage, and salmon intensification. Researchers have correlated this remarkable culture change with profoundly cooler and wetter climate, and the expansion and lowering of pine forests
(Chatters 1998; Prentiss et. al 2005, 2007, 2008). Temperature changes caused greater seasonal climatic variation in the region, resulting in the more predictive and intensely concentrated seasonal migrations of both anadromous salmon and terrestrial resources. Instead of large catchment areas, it became easier to relocate settlements in valley bottoms in proximity to highly productive anadromous fish resources and forest/grassland ecotones where additional resources were abundant, diverse, and snow cover less severe. Rousseau emphasizes the importance of increasingly cold winters and deep snow which would have inhibited movement of people, forcing once highly-mobile groups to construct semi-permanent winter pithouses to remain warm. The appearance of small pithouses at this time may also be a response to increased environmental prosperity and resource diversity, abundance and availability, or new technological innovations (Hayden 1992c; Kuijt 1989; Prentiss and Kuijt 2004b). In such an environment, groups were able to experiment with variations in socioeconomic systems such as serial foraging, low mobility foraging, and logistically-oriented behaviors (Chatters and Prentiss 2005).

Initially, macroregional trends on the northern Northwest Coast saw development of collector-based groups practicing more sedentary settlement strategy, food storage, and logistically organized behaviors. Inhabitants of the northern Plateau were later introduced to these lifeways possibly through diffusion of cultural traits, and the new socioeconomic strategy by way of other groups along the Lower Fraser who pushed upstream into the Mid-Fraser following salmon runs (Lawhead and Stryd 1985; Rousseau 2004:11). Such interaction resulted in beneficial exchange of technology, knowledge, lifeways, language, and genetics (Salish Incursion Model). Early Plateau-Pithouse tradition pithouses in the Mid-Fraser, use of sophisticated subsistence technologies and
some scheduled resource collection, represents a mutual acculturation and melding of these two groups and supports Elmendorf’s model of Interior Salish origins and migrations based on linguistic data.

A summation of possible factors in the cultural transition between 3500-3000bp include: 1) seasonal incursion of Coast Salish peoples and exchange of information, materials, language and genetics with Shuswap phase people, 2) intercultural (Coast-Plateau) exchange of technologies and subsistence practices which led to greater logistical collecting behavior in interior regions; 3) prolific, abundant, and varied food resource base available at this time; and 4) the increasingly cooler climate, with greater seasonal variation and deepening snow falls starting around 5000bp, which seriously curtailed winter movements and necessitated the construction and use of simple, shallow pithouses around 3500bp.

Prentiss and Chatters (2003) and Chatters and Prentiss (2005) take a macro-evolutionary approach to explain the transition to collector-based economies throughout the region. The remarkable abundance and diversity of resources available to prehistoric coastal groups during the climatic optimum beginning at 5000bp allowed a florescence of cultural experimentations with new settlement and subsistence practices. Foraging groups prior to 5000bp practiced a pattern of high residence mobility and limited breadth of prey choice items (Matson and Coupland 1995) confined primarily to large terrestrial ungulates. With improving climatic conditions (wetter and cooler) forests expanded increasing abundance and diversity of mammals and salmon became seasonally available in concentrated numbers. Additionally, isostatic rebound of the coastal landscape increased the surface area for shellfish beds greatly expanding the productivity of this
food resource. Within such ideal conditions and with increased sedentism, population increased within the region. However, an abrupt downturn in climatic conditions adversely affected the abundance and diversity of food resources in the coastal environments, effectively weeding out most settlement/subsistence strategies. One strategy was successful and was selected for, this being the collector-based strategy marked by semi-permanent winter villages, storage of resources, and logistically-organized forays. Within a few generations, this successful pattern spread throughout most of the Northwest Coast and, according to Prentiss and Kuijt (2004b), later moved into the Mid-Fraser Region by 3500bp, supplanting earlier Interior peoples.

**Plateau Pithouse Tradition: (3,500-200bp)**

The Plateau-pithouse Tradition (Ppt) begins with the earliest evidence of subterranean pithouses in the Mid-Fraser region and sees the gradual formation of large pithouse villages. Socioeconomic inequality and later ascribed status inequality emerge late in this period (post 900bp (Prentiss et al. 2007) (though others believe inequality emerged as early as 2400bp (Hayden 1997; Lepofsky et.al 1996)). Regional subsistence economies see the gradual intensification of salmon harvesting, processing and storage. Trade networks are well established and period sees the emergence of an elite social class, based on household corporate groups. Differential access to food resources becomes common (Lepofsky et al. 1996). Ownership of resource localities occurs for the first time in the region (Hayden 1997). There is evidence of ceremonial feasting, i.e. potlatches.
The late prehistoric phase (Kamloops horizon) sees the cultural transition/articulation into the ethnographic culture of the St’át’imc (Upper Lillooet), who currently reside in the area. The Plateau Pithouse Tradition is divided into 3 periods: the Shuswap Horizon, the Plateau Horizon; and the Kamloops Horizon.

**Shuswap Horizon (3500bp-2400bp):** The Shuswap Horizon sees the rapid emergence of true collector-based lifeways with a logistically organized collector adaptation. More food storage and regular winter residency in pithouse villages are both established, and helped sustain steady population growth. Groups exploited a variety of abundant foods. Houses were small and usually exhibited no rim or midden areas. Usually only a single central hearth was present in the structures suggesting residents lived as a single, egalitarian, economic unit (Prentiss et al. 2005). Culture changes are correlated with the initiating of extremely cool and wet Neoglacian conditions across the region which increased the abundance and consolidation of anadromous salmon to specific and predictable seasonality (Chatters 1998; Rousseau 2004) making possible the mass harvesting of this resource. The Neoglacian conditions expanded forest growth, maximizing biological carrying capacity while grasslands contracted. Such conditions forced ungulates to forage in the only available open land in river bottoms, and along shorelines making them easier to hunt. The Shuswap horizon was a time of plenty which allowed small catchment area foraging and collecting (Rousseau 2004).

Both foraging and scheduled collecting for a wide selection of food resources was initially made possible by low population stresses (Rousseau 2004). With time, however, increasing sedentism resulted in exponential population growth. Delayed
consumption behaviors such as salmon storage were initiated during this time, though they appear not to be excessive as a variety of other food resources were abundant. Deer meat continued to comprise a substantial portion of the diet. Isotope analyses of human skeletal material show sharp increase in salmon consumption from earlier periods (Chisolm 1986). Rousseau (2004) estimates that there existed 3-5 sites in each valley within the Mid-Fraser, each consisting of 3-10 pithouses. Population growth was most dramatic between 3000 and 2400bp and then peaked during the subsequent Plateau horizon.

According to Hayden and Spafford (1996), lithic technology centered around a core and flake-based industry called the “winter-village lithic organization.” Noted by high degree of variability in material quality from local sources. Collection of core material was embedded into logistical forays to be later utilized during gearing-up periods over the winter months (Hayden 1997). There is an increase in bone and antler technologies in such forms as leister tips, harpoons, needles, bone awls, and needles. Projectile point forms primarily stemmed points, also contracting and expanding stems. Some note their similarity to Oxbow and McKean-Hanna-Duncan complex atlatl dart points, suggesting contact with Plains groups (Rousseau 2004). Key-shaped unifacial scrapers for use on thick spear shafts, abruptly disappear with the introduction of the bow and arrow at 1200 BP (Rousseau 2004), or possibly earlier around 1600-1800 BP (Prentiss 2010, personal communication).

Chatters and Prentiss (2005) suggest that technologies and importantly a new socioeconomic system are brought in from the Coast, either through cultural transmission or displacement of peoples, specifically by the late Charles or early Locarno Beach
groups in the Gulf of Georgia region. The Shuswap horizon terminates with the warming and drying of the region, producing conditions similar to today’s. Prentiss et al. (2005) suggest that socioeconomic complexity is not simply a process of small groups coalescing, and then developing complex social organizations featuring social inequality. Rather, a more fundamental change in socioeconomic structure may indeed be driving such change. The establishment of large multi-family households permitted the “control of resources and intensive simultaneous harvesting of diverse, simultaneously available resources,” (Prentiss et.al 2005:219).

Adaptation to highly abundant but clustered resources, such as spawning salmon offers huge rewards for groups who are able to mass harvest and store salmon. Such ecological and technological conditions which existed during this period may have allowed complex collecting to emerge within the rigid social confines which would otherwise reject such change in less productive, more risky environments (Prentiss et.al 2005).

**Plateau Horizon (2400bp-1200bp):** The Plateau Horizon saw the emergence and expansion of large complex aggregated winter villages, some containing over 100 pithouses and exhibiting a high degree of labor organization and status differentiation (Prentiss et al. 2005). These changes are correlated with intensification of a stored salmon economy supplemented with root and deer resources. An increase in ground slate tools, believed to be for fish-processing, further supports this trend. The multi-family (or corporate group) household emerges as a socioeconomic institution. This allowed the efficient organization of labor, effectively utilizing a “group of families with
complementary areas of expertise,” (Prentiss et al. 2007). Firm evidence for logistical 
mobility is seen in contemporaneous special-use sites in upland areas associated with 
hunting and root collecting. Ownership of deer hunting territories and quarries emerges 
(Hayden 1997). Only after 1300bp is there evidence of status inequality (Prentiss et. al. 
2005, 2007). Population throughout the region reached its peak by 1200bp followed by 
an abrupt collapse and abandonment of the villages. The early dates for the Bridge River 
occupation (BR2 and BR3 periods) (1800bp-1100bp) fall within the latter half of the 
Plateau Horizon.

The emergence of the Plateau Interaction Sphere (PIS) (Hayden and Schulting 
1997), an inter-regional trade network, occurs at the onset of the horizon and is 
coincident with the emergence of the Marpole phase cultural florescence in the gulf of 
Georgia region. This is possibly a result of enterprising elites looking after their own self 
interest, or possibly a collective need to establish and maintain interregional movement of 
important food and raw materials and high-quality lithic materials, including nephrite and 
nephrite adzes. Hayden suggests that slavery is associated with nephrite adzes because of 
the time investment necessary for their manufacture. Rousseau sees the emergence of the 
Plateau Interaction Sphere as a risk-reducing strategy established by the collective groups 
of the region. Elites, he continues, will emerge organically as interregional trade became 
formalized.

Craft specialization develops in the Mid-Fraser during the Plateau Horizon, 
including the first occurrence of the Interior Plateau art tradition. A well-developed 
antler and bone tool industry emerges. The bow and arrow are adopted possibly leading 
to the reorganization of ungulate hunting parties and hunting strategies (Rousseau 2004).
High population numbers resulted in depression of localized food resources, leading to the intensification of fish/roots and other secondary foods (Rousseau 2004).

*Kamloops Horizon (1200-200bp):* A highly logistically organized subsistence and settlement strategy was maintained throughout the Kamloops Horizon, continuing a pattern of winter pithouse villages and upland basecamps. There is a continued heavy reliance on salmon supplemented with deer and small animals as well as the use of plant resources. Interregional trade (PIS) is maintained as is the continuation of unique plateau art tradition. What distinguishes this Horizon from the previous one is increased variation in sizes and floor plan configurations of pithouses, the appearance and continuance of Kamloops style arrow points and complete absence of side-notched points by 1000bp, and the significant elaboration of mobile art traditions including the decoration of utilitarian items. There is a marked decline in the frequency and intensity of root resources, and a notable reduction in population densities, particularly after 1000bp (Rousseau 2004).

Regional populations collapsed between 800-1000bp, with all the major villages being abandoned. Hayden (1997) attributes the Texas Creek landslide and the subsequent blockage of salmon runs as the cause of regional cultural collapse. Citing macroregional population decline, Prentiss et. al (2005) suggest a broader systemic decline due to the abrupt warming/drying of the climate and the subsequent impact on salmon and root resources. Others attribute the broad collapse to the overexploitation of upland resources, primarily roots and deer (Rousseau 2004). The Kamloops Horizon terminates with the arrival of Euro-Americans in the region 200 years ago.
According to Prentiss et. al (2005), and very important to this study, institutionalized inequality (as per Wiessner 2002) developed out of the complex collector economy. Keatley Creek site sees prestige goods unevenly distributed only after 1200bp, 1000yrs after its inception. Similarly, the Bridge River Site provides evidence for inequality only in the last 200 years of its 700 year history (Prentiss et. al 2009). In both cases, it seems that inequality emerges with a possible reconfiguring of the resource base, such that only a few localities could support large groups (Arnold 1993, 2004). The Keatley Creek community asserted greater control over resources and ideologies, possibly leveraging their position to attract larger kin groups and clients and thus enhancing their socioeconomic position, and incorporating marginalized groups (such as the Bridge River community) who were unable to maintain their community with the decline in salmon abundance (Prentiss et. al 2008).

3.3 Historic Context: (200 BP-Present)

Russian America was ceded to the British after 1805, and the Hudson’s Bay Company took over operations along the Northwest Coast, eventually moving inland as coastal fur-bearing animals became exploited and establishing forts in Vancouver, and Prince Rupert. Lewis and Clark's Corps of Discovery reached the West coast, at the mouth of the Columbia in 1806, further clearing the way for settlement from the East. Early explorers in the Mid-Fraser include Mackenzie who travelled downstream on the Fraser as far as Alexandria (near modern Quesnal) in 1793, before altering course
towards Bella Coola. Other explorers included David Thompson and Simon Fraser. Fraser passed through the Lillooet area in June of 1808, and noted items of non-Indian manufacture amongst the St'át'imc “particularly, a new copper tea kettle, and a gun of large size and which, perhaps, are of a Russian manufacture,” (Fraser 1960: 83). Fraser traded a file and tea kettle for two canoes which were then used to descend the Fraser River, downstream of Lillooet. St'át'imc ethnohistories recount first contact with Simon Fraser, remembering him with a tattoo of the sun on his forehead and the moon on his chest (Kennedy and Bouchard 1978:42-43). He is believed to have transformed Beaver into a human being and raised a man from the dead to accompany his party down the river, during which time the earth “trembled”. (Kennedy and Bouchard 1978:52). The St'át'imc called Fraser and his party "drifters", sons of the Sun and Moon.

A series of gold rushes drew masses of Euro-Americans, Chinese, and other groups to the West beginning first in Denver in 1841, and then in northern California near Sacramento. The Fraser Canyon Gold Rush 1858-59 followed the Sacramento boom, and extended from the town of Yale to Lillooet. The Cariboo Gold Rush of 1862, located within the project area, continued to attract new settlers into the region, primarily British and Canadian, further stressing relations between indigenous groups and the newcomers. Construction of military forts and the Caribou Wagon Road were built to assert control over the region and assist the miners.

Newcomers, specifically “Boston men”, are known to have ravaged Indian rootcrops, cattle, and horses (Begbie 1861:242-243). Such contact affected the St'át'imc profoundly. Indigenous inhabitants were devastated by newly introduced diseases such as small pox, tuberculosis, and venereal diseases. A smallpox epidemic depleted the
Lillooet population in 1863, killing as many as 170 St'át'imc, and pithouses were filled with corpses (Kennedy and Bouchard 1978).

The first missionaries to arrive in Lillooet were the Anglicans in 1860 and later, the French Catholics. Subsequent mineral finds occurred in the Bridge River Valley and mining is still conducted today. A Japanese internment camp was established in Lillooet during the “relocation” period of WWII.

3.4 St'át'imc

The St'át'imc, or Upper Lillooet Indians, are linguistically classified as part of the Interior division of the Salishan language family. They are bordered culturally by the Shuswap and the Thompson on the north and east who are also Salish speakers. Their southern border is with Mainland Halkomelem Coast Salish language groups. To the west are the Squamish, Sechelt, and Mainland Comox, also Coast Salish speakers. Their northwest border is with the Chilcotin Athabascan language groups. The St'át'imc are located within the larger culture area known as the Plateau defined by Kroeber (1939) which encompasses a region extending from northern British Columbia south to the Lower Columbia River, and between the Cascade/Coastal Ranges and the Rocky Mountains. Interior Salish is spoken across most of region, with Sahaptin speakers on the Lower Columbia, Algonquin speakers in the eastern areas of the Plateau and some Athabaskans on the north. Cultures within the Plateau share a common subsistence base
of stored anadromous salmon, roots, and ungulates. Hayden and Schulting (1997) suggest that peoples of the Plateau were traditionally highly integrated through extensive trade networks, or interaction spheres, resulting in macroregional cultural commonalities.

According to informants, the Lillooet have been divided since time of the mythical Transformers by Upper and Lower Lillooet divisions. St'át'imc designates the Upper Lillooet residing in a territory extending from modern town of Lytton north to Pavilion Creek, as well as those living around Seton and Anderson Lakes. The St'át'imc are more affiliated with the Plateau cultures and is the group residing within the current project area. The Lower Lillooet belong to the Northwest Coast culture area (Bouchard and Kennedy 1978).

Ethnographic records indicate that 54 winter villages were known throughout the region during the late 1800’s (Bouchard and Kennedy 1978). St'át'imc winter villages are situated on river terraces located strategically near productive salmon spawning rapids, usually near constrictions of the Fraser where spawning salmon naturally accumulate below rapids. Village locations were also chosen dependent on fresh-water streams, loose deep sediment, and nearness to clay outcrops important as both a roofing material and flooring material for dwellings.

Winter villages were comprised of dense concentrations of semi-subterranean pithouses ranging from 5 to 20m in diameter. Houses were approximately 1.2 m (4ft) deep with a substantial wooden superstructure which was covered with pine boughs, matting, soil, and capped with clay. Entrance down a notched log ladder was through an opening in the center of roof. Interior features of pithouses included low log or earthen benches along outer wall, covered in pine boughs and skins for bedding and sitting.
Baskets of goods were stored underneath it and in the rafters (Hayden 1997). The entrance ladder end was carved or painted with the clan totem of the owner. Pithouses were fully occupied from December through February, and then only by the old and infirm throughout the remainder of the year, as others dispersed on seasonal rounds. Pithouse superstructures were burned at intervals and then re-built and re-occupied.

Excavations from the 2008 Bridge River field season indicate that floors were re-laid every 15-40 years directly over older floors, and that super structures were burned every 100 years (Prentiss et al. 2009). Importantly, the large and medium sized pithouses were often multifamily structures, exhibiting repeating suites of domestic features occurring around the periphery of the inner structure (Hayden 1997). These domestic subgroups are defined archaeologically by the presence of a hearth, storage features, sleeping area, and domestic artifacts. Up to six sub-groups (families) may have resided together in the larger houses, often with a total population exceeding 40 people and dogs (Hayden 1997; Prentiss et. al. 2005). The multi-family or corporate household functioned as a discreet socioeconomic unit, allowing optimal acquisition of multiple, simultaneously occurring food resources in different areas (Hayden 1997, Prentiss et. al 2005).

Storage of roots, salmon, berries and deer meat was primarily in underground storage caches located within the pithouses. Bark lining of the cache pits and layers of pine-needle beds protected the stored food resources from rodents and bacteria. In ethnographic times, storage facilities were often located just outside of the house (Kennedy and Bouchard 1978). Food was also stored in wood boxes or baskets on elevated platforms or in the rafters of the pithouse.
Summer houses consisted of mat lodges, erected at resource procurement locations such as salmon fisheries, upland hunting camps, or root collecting grounds.

Material culture of the St'át'imc consisted of a variety of coiled and imbricated cedar root, spruce, pine and cotton basketry forms used for stone-boiling food, carrying, and storing. Birch bark containers were also commonly used. Mats made of sewn cattail and tule were very common for use as roof covering for mat lodges, flooring material, bedding and clothing. Blankets were woven of mountain goat wool sewn into dog hair of small, white curly haired dogs raised for this purpose (Teit 1906:210-212, 215). Wooden dishes were common, often made of hollowed-out birch or maple. Wedges for wood working were made from elk and deer antler as well as yew wood. Knives, scrapers, and chisels were made from stone. Bone awls were important. Nephrite adzes were used for wood-working purposes.

**Seasonal Round:** Traditionally, the St'át'imc practiced a seasonal round which took them to different physiographic zones throughout the year to procure a diversity of food resources. Following sedentary winters spent subsisting on stored foods within large aggregated villages, families dispersed in the spring to collect and process plant foods for winter storage. These included the young stalks of Indian rhubarb, stinging nettles, balsam root, and fireweed. In summer and fall roots of mariposa lily, yellow dog-tooth violet, and nodding onion were dug with digging sticks. Berry habitat was often burned in the spring to encourage/foster accelerated growth in the fall. Other spring resources included trout in highland lakes and early runs of Chinook salmon caught from fishing platforms along the Fraser.
Salmon was the main staple of the Lillooet (Hayden 1992b; Kennedy and Bouchard 1978; Teit 1906). In addition to the Chinook run was the August run of sockeye occurring during a period of lower river discharge in which mass harvesting of the resource could occur. Hayden (1992b) notes the importance of the August sockeye run as a time for trade, marriage exchanges, and ceremonialism (see also Fraser 1974). Salmon were and continue to be mass-harvested with dip nets, set nets and float nets by both men and women from cliff-edges above 6-mile Rapids (Sxetl), at the confluence of Bridge and Fraser Rivers. Dip nets are long-handled round nets, often with a draw string which closes the net top. Dip netters swept the nets down-stream in silty water, into masses of fish swimming up-stream. Set-nets are rectangular gill-nets attached to long poles extending out over the river. Float nets consist of a rectangular gill-net with a large float tied to one end with a length of rope which the current pulls out into the river, leaving the near end of the net fixed to the shore.

With the arrival of sockeye in August, 1000’s of fish are mass-harvested, processed and then hung in the many drying racks in the cliffs above the rapids. Once dried, the salmon can be stored for over a year. Salmon filets and spine are later consumed by pounding the remains into a dried powder and mixed with berries and fat or oil (Sam Mitchell cited in Romanoff 1992:485). According to Kew (1992), and Hayden (1992b), each individual would need to harvest and successfully wind dry at least 300 sockeye salmon to survive the winter. Surplus salmon beyond subsistence was a significant economy of the St’át’imc, which could be traded for a variety of items including deer hides and eulochon oil, or prestige goods such as guns, iron, and copper.
In the fall, following the late summer salmon spawns, hunting parties spread into the mountain uplands to communally hunt deer and other large ungulates. Mule deer (*Odocoileus hemionus hemionus*), was the most important land mammal food resource. They were caught through a variety of ways including deadfall traps, snares, fences, spears, clubs, and bow and arrows. Specially trained hunting dogs would help run down deer and black bear. Other animals hunted for meat and hides include black bear, mountain goat, Rocky Mountain elk, California bighorn sheep, American beaver, whistler and snowshoe hare. Waterfowl included swans, ducks, geese, and grouse and ptarmigan, hunted at various times of the year.

By late December, dried salmon, roots, and deer meat were stored in houses at the aggregated villages. Families remained at the villages until spring.

Critical non-food species important to the St'át'imc included porcupine for teeth and quills, raptors for feathers, loon bones for shamanistic healing tools, fur-bearing animals for clothing including wolf, marten, fisher, weasels, fox, cougar, and coyote, shells for decoration, avian bones for gaming pieces, and carnivore teeth/claws for pendants. Plants, deer, and anadromous salmon, the most important food staples for the St'át'imc, will be covered in more detail below.

**Social Organization:** It is believed that all inhabitants of a village were originally the descendents of a common first ancestor. This belief functioned to bind the community together through knowledge of a common origin myth and helped establish identities through membership in clan communities and descent groups. Origin myths are associated with these first ancestors and include the Fountain community’s belief that
they are descended from Coyote and that the Bridge River Band is descended from Bear. The sociopolitical unit is the band, comprised of two or three villages, often associated with or defined by a river. As noted above, band or clan totems are sometimes carved and/or painted on the tops of housepit ladders.

The St’át’imc are considered one of the most culturally complex groups on the Plateau (Schulting 1995). Their sociopolitical system is considered intermediate between ranked and stratified forms, and is often termed transegalitarian (Hayden 1992c; Romanoff 1992:494). Status and influence for individuals were acquired through wealth, oratory, or generosity or a man could be noted for his skill as a hunting or war leader. High status was also gained through inheritance and could later be validated by strong spirit acquisition and by feasting events (Romanoff 1992:495). Wealth, however, was the surest pathway to power, and was made possible through the accumulation of large surpluses of salmon, often through the stewardship or ownership of resource localities.

"Those families considered wealthy resided in large houses and maintained slaves. Such households include a fringe of poor relatives who provided services in exchange for protection and food." (Romanoff 1992:248).

The elite wore expensive clothing such as deer or goat skins and displayed more personal ornamentation; had many wives who were producers; dominated trade networks; and endeavored to maintain the support of corporate group through feasting events of deer meat and distribution of gifts (see Sebastian 2006). This system was similar to big man organization in which a combination of heredity and achievement was used as a pathway to power.

Across most of the Plateau and Northwest Coast, wealth was transferred to prestige through distribution of special foods and coveted items during the potlatch.
(xelitxal) ceremony. The potlatch means “calling the people together” Teit (1906:258). It was a formal feasting and redistribution event hosted by a household which was used primarily as a means of validating and maintaining status of the family. The Upper Lillooet exaggerated this process, often using hostile gift-giving as a means to power. Competitive potlatches were often held between chiefs (Teit 1906:258).

“Dried deer meat was the predominant gift at potlatches,” (Romanoff 1992:474). Goat hair blankets were also commonly distributed (Kennedy and Bouchard 1978). Dried salmon was not a potlatch food, but, importantly it allowed for the purchase of deer meat. Condition of the potlatch was that deer meat served to participants, either acquired by hunters and accumulated over a year. Sometimes a whole deer carcass was thrown into a pithouse during a potlatch where a "scramble" ensued, being randomly butchered by the guests (Kennedy and Bouchard 1978).

Although less extreme than the coastal potlatches, potlatches among the St’át’imc contained similar characteristics such as validation of status and prestige, marked distinction between the host group and guests, extraordinary and sometimes hostile giving, and inclusion of trade goods among the gifts,” (Romanoff 1992:474). Kuijt (2002) emphasizes the function of ceremonial feasts and funerary potlatches as institutions which allow the negotiation and creation of social identities, and act to unify dispersed communities through symbolic tasks performed by members of opposing clans or moieties (see Jonaitus 2004). Such large potlatches marked changes of status or claims of superiority…included events such as honoring the memory of the dead, to give ancestral names to children, merely to increase the status of the host, for prepubescent
eldest son of a deceased “clan” chief, and for the same boy when he became a man. There were feasts when a man assumed a name or after a death.

High prestige was afforded to hunters who produced highly-desired deer meat and hides for potlatches. According to Romanoff (1992), the potlatch institution functioned as a defense against fluctuations and failures in salmon spawns by preserving the importance of deer hunting, and the importance of maintaining necessary training and skills to accomplish it. Deer was a safety food which could be relied on if and when salmon spawns failed or if stored salmon was in poor condition. Deer meat provided important saturated fats that salmon do not, and was unlikely to go rancid when stored (Romanoff 1992).

Slaves were kept in large numbers by the St'át'imc, but only for short periods as they were mainly used for trade and bargaining. The town of Lillooet was main trading center of the region, and saw aggregations of Coastal, Shuswap and Thompson groups during the spawning runs of late summer (Fraser 1974; Teit 1906). Lillooet offered wind-dried salmon, while coastal groups traded dentalium/abalone/eulachon oil, mountain goat blankets, and dyed inner red cedar bark.

**Cosmology:**

According to the St'át'imc, the world was originally inhabited by “animal people” who had both animal and human attributes. Coyote (or trickster) was sent by “Old Man” to put world in order for the coming people. Four transformers assisted Coyote in the task, and in the process rid the region of people-eating monsters, leaving metamorphosed rocks in the form of animals and people as proof of their deeds and travels. Heavenly
bodies were animal-people who visited the Upper World and become transformed. Old Man travelled through Lillooet and is still revered, being addressed by adolescents in their invocations to Him during puberty rites.

The Dusty trail of the Dead into the West leads one to land of Dead. Old men along the road turn back those not ready for death. The Dead and Old Man sit on stone wall separating worlds of living from the dead. Souls inhabited a large 4 room stone house located at the end of the Trail of the Dead. Souls that have not yet entered into the third room may be brought back to life by a shaman.

**Ceremonialism:**

Potlatch, guardian spirit dance, and circle dance dominated the ceremonialism of the area. Clan masks which represented the first ancestor of a descendent group are displayed during the potlatch, or some event of the first ancestor. However, the host never wore mask as it represents the dead, an old man, instead was hired to wear the mask, sing the clan songs, and dance or act the clan legend.

The “Letting down” festival involving an exchange of gifts, usually lowered down into a pithouse from roof entrance on the end of a rope or crooked stick. “Guardian Spirit” dance in which young men and women expressed their possession by guardian-spirit in song and dance during winter ceremonials. “Often dances were accompanied by displays of power such as the dancer causing deer meat or fresh out of season berries to occur.” (Teit 1906:286).
Ghost or religious circle dances were initiated by people carrying messages from the land of the dead (Teit 1906:283-285). During the ceremony, Old Man was prayed to for protection from harm by ghosts, for long life and health.

Shamanism played an extremely important role in the past. Shamans acquired powers through a spirit helper (raven, golden eagle, mink or owl). Their training required a more vigorous vision quest than others. Their transitional/transformational nature and liminal status within society aided in his or her ability to cure, fortune tell, travel to the land of the dead, communicate with spirits and ghosts, and aid in hunting. Such power was often suspect within a community and balance between good and evil (shamanism vs. witchcraft) was often blurred, shifting, and political.

The St'át'imc have had a history of conflict with the Chilcotin, an Athabaskan group bordering them to the northwest who would raid the Lillooet area to acquire wind-dried salmon and slaves. Palisaded villages were used by the St'át'imc for defense, though they also maintained a wide-ranging trade of surplus salmon to diffuse tensions. Warriors painted faces and wore armor of rawhide and wood, and wrapped marmot skins around left arm to ward off blows. Blood feuds were common between communities, often resulted in the decimation of a village (Teit 1906:236). Disputes were often settled through intermarriage, or by exchange of gifts.
3.5 On the Nature, Variation, and Social Importance of the Three Main Food Resources of the St'át'imc:

**Salmon:** The importance of anadromous salmon to cultures of the Northern Plateau since 3500 BP cannot be overstated (Walker 1998) (Figures 3.5.1-3.5.3). Salmon was and is important not only as a primary food resource, but is interwoven into the culture, mythology and identity of indigenous groups. Precision of annual spawns of sockeye and Chinook salmon have structured much of the lifeways of the later ethnographic cultures (Schalk 1977). Major prehistoric villages of the region, beginning in the Plateau-pithouse tradition (3500bp) are situated at fishing grounds, and were centers of trade, marriage, slave exchange, and ceremonials during the height of spawning season. Bridge River Village itself is strategically situated in proximity to the 6-mile rapids, the most

Figure 3.5.1. Processing salmon for wind-drying.
productive fishery in the Mid-Fraser whose late August sockeye run averages 1 million fish. Ethnographic and prehistoric cultures within the Mid-Fraser were reliant on a stored fish economy, supplemented with deer meat and roots (Teit 1906). Variation, however, in the abundance of this resource, as well as precise conditions required for proper drying of the fish necessary for winter storage, are often over-looked as risks for communities who grow reliant on this resource (Hayden 1992b).

Anadromous salmon in the project area are hatched in freshwater streams of the upper Fraser, in the gravels of high mountain lakes or secondary tributaries. The young remain in these environments throughout the winter until grown to finger-sized fry, at which point they follow stream currents out to the open ocean during spring freshets/discharge. In the salt water, they spend the majority of their lives and fatten-up exponentially. All young salmon born within a particular tributary/lake environment in a particular year are a genetically distinct breeding population or “race.” Depending on the species of salmonid, after anywhere from 1 to 4 years the race of salmon return to their natal stream to spawn and die, traveling upstream many miles, over falls, in remarkable numbers. The timing of their return is genetically programmed at birth to maximize conditions favorable to reproduction and survival of the young. In the higher latitudes of the Northwest Coast and Northern Plateau, the timing of the annual spawning migration is often precise, occurring within a few days of the same time each year, and patterned in such a way that multiple races from various streams return to same river system, such as the Fraser, yearly.

Anadromy, like many forms of migration (caribou, waterfowl, etc.) is an evolutionary response for coping with highly seasonal environments. Conditions must be
precise for spawn to occur. According to Schalk (1977), salmon are sensitive to even smallest of changes in temperature. In northern latitudes often a confluence of optimal conditions occurs for a limited time, condensing the runs into an intensified mass, occurring within a 10 day period. Cold clear water is ideal for salmon reproduction in riverine environments. Cold water is oxygen-rich promoting healthy growth and it is cold enough to be “food-scarce”, prohibiting the secondary predators/secondary biomass who would otherwise feed on the fingerlings. Warm riverine water has an inverse affect, which is often detrimental to reproduction. Bacteria and fungus attack the eggs, fry, and spawning salmon. Regional climate effects the temperature of the water and thus the structure of this fish resource. Rises in atmospheric temperature obviously raise the temperature of the water, but also widens the window in which salmon may spawn. Colder temperatures and less evapotranspiration result in later spring freshets and earlier freezes in the fall, compressing the time of spawning into a short/very intense/precisely timed period, usually in late fall. Finally, salmon, including those of the Fraser River system operate on four-year cycle of fluctuating abundance. According to Kew (1992), studies indicate that first year of the cycle is most abundant, second year numbers drop by a half. Third year less again, then a slight increase during the 4th year to a little less than half of the first year.
Within the Mid-Fraser, two main runs of salmon occur annually: the spring Chinook run and the late August sockeye run. The Chinook run occurs during spring freshet of the Fraser River, when the river is swollen and violent from rapidly melting winter snowpack. Spawning Chinook average 20lbs and are very oily and fatty, and not conducive to drying and storage. Traditionally, Chinook was considered a prestige food due to its high fat content and palatable flesh (Hayden 1992b; Teit 1906).
The sockeye run is much more extensive and more important to the indigenous groups of the area, including the prehistoric Bridge River community. This is the largest run on the Fraser and the greatest producer of salmon production in North America. Importantly, a coalescing of natural factors make the Mid-Fraser a perfect location for the mass harvesting, processing and drying of the resource. These factors include, first, the late summer relative calming/stabilizing of the Fraser River as snow melt from the mountains subsides allowing easier and safer access to fishing locations. Lower water also means that fish are more condensed into narrow channels, constricted areas within the river corridor, making them easier to harvest. Secondly, the salmon arrive with exact precision, within a few days of the same time each year, subsequently, scheduling of
logistical fishing/foraging/hunting/social activities can usually be relied upon. Third, upon entering freshwater rivers to spawn, anadromous salmon stop eating, relying upon stored fat to provide energy needed to navigate to upstream localities and spawn. By the time sockeye salmon reach the Lillooet area (a distance of 500 river miles from the ocean), their fat content is nearly depleted. The lack of fat and oil in their meat makes them perfect for preserving through wind-drying, and less prone to rotting during storage. Lastly, weather conditions during the arrival of the sockeye in late August are generally warm, dry, and windy. Ideal for the wind drying of this food resource. When all of these factors are favorable, mass harvesting and drying of sockeye occurs in a wild frenzy during the 10 days of the run. In this period, individuals ideally harvest and dry 300 salmon (Kew 1992; Hayden 1992), which would then be stored for winter consumption. With new technologies for mass harvesting, processing, and drying of salmon, coupled with a socioeconomic strategy involving extended households collectively sharing workload, made semi-sedentary, aggregated villages possible beginning 3500bp in the region. However, if any of these factors end up being not so favorable, catastrophic circumstances may ensue for communities reliant on a salmon-based economy. Climatic change which warms the river water may decimate a spawn, resulting in a missed spawn 4 years later. If it rains during the run or winds don’t come, salmon may not be dried properly and will rot later in storage. Also, scheduling conflicts may result in a group not making it to the river in time, raiding may occur with devastating effects for winter sustenance, bad leadership. Catastrophic events such as landslides may block the river, keeping salmon from making it up. Natural 4 year fluctuations may be extreme. Historical accounts detail failed runs in the Lillooet area and the devastating/far-reaching
famine which ensued, not only impacting the local community, but trading partners such as the Thompson and Shuswap who had come to rely on traded salmon surplus.

According to informant interviews, salmon runs are variable from year to year (Table 3.5.1). Cycles of plentitude and destruction of salmon populations documented in fisheries statistics.

Table 3.5.1 Fluctuations of salmon during four year cycle.

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Salmon Available Model Estimate (1000’s of kilograms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>69,194</td>
</tr>
<tr>
<td>2</td>
<td>19,163</td>
</tr>
<tr>
<td>3</td>
<td>24,698</td>
</tr>
<tr>
<td>4</td>
<td>32,731</td>
</tr>
</tbody>
</table>


In sum, as Kew (1992) and Schalk (1977) note, anadromous salmon are not a stable resource, but are instead highly variable, affected by a variety of environmental factors. “Differences in the character of the fish resource within and between regions are central to an understanding of both archaeological and ethnographic variability throughout a very substantial portion of earth’s northern hemisphere,” (Schalk 1977:210). A salmon-based economy reliant on the coalescing of multiple environmental factors, often beyond the control of humans, makes for an insecure/precarious existence, susceptible to a variety of factors. These variables must be combined with technological factors to fully understand the importance of human predation and salmon/human relations.
**Deer:** Like salmon, white-tailed deer (*Odocoileus virginianus*) and mule deer (*Odocoileus hemionus*) are believed to fluctuate in abundance throughout the region indirectly and directly in response to climatic events (Chatters 1998). Increasing moisture and cooler temperatures expand forests, increasing the habitat of the species and thus its abundance. More directly, severe winters are known to decimate a population of deer, often taking years to re-establish their numbers (Kuijt and Prentiss 2004; Rousseau 2004). Deer would be taken in the fall as well as the spring (Alexander 1992), and their subsistence round was organized around the acquisition of this highly valuable resource.

Early in the prehistory of the Mid-Fraser, before the transition to collector-based economy, white tail and mule deer made up the majority of the indigenous diet. Sites occupied during the Nesikep and Lochnore periods reveal a diet focused on deer meat. Later in prehistory, with introduction of bow and arrow and deer fences hunting became more efficient, and, coupled with increasing regional populations, made deer scarce in certain sub-regions.

The importance of deer in the ethnographic period is substantial. Deer is considered a prestige food by the St'át'imc and was the primary potlatch food. Deer meat is considered a sign of prestige/elite status. Socially, deer meat was associated with elites. Household elite would hire hunters, including specialized hunt leaders, to procure deer meat for elaborated feasting events (potlatches), acquired over years for one event. High status individuals called deer stewards (Romanoff 1992; Teit 1906) were in charge of organizing, regulating the hunting of deer in specific highland environments. Hunters usually had several wives, commanded a following, wore high-prestige deer hide or buck skin clothing, and were considered “rich” (Romanoff 1992:470). “Hunting
chief” term used for high-status hunter (Teit 1906). Hunting techniques favored cooperative behavior. Men who led hunts were trained, acquired a spirit, and acted as a kind of redistributor, and indirectly received rewards according to general norms of Lillooet society (Romanoff 1992:470).

Hunting chiefs scheduled hunts and would call on “professionally trained” hunters to hunt for them. These hunters were highly trained and knowledgeable of the local geography and of deer behaviors. They were well-trained with the bow and arrow and, importantly, were said to have acquired powerful spirit helpers such as bear, lynx, wolf and wolverine which aided them during the hunt. Their strenuous training included early morning runs, and bathing in cold streams. Runs familiarized the child with geography and the imbeddedness of myths into the landscape, specifically those stories relating to Coyote.

Distribution of meat on the hunt was obligatory and roughly egalitarian (Romanoff 1992:474). Among the Lillooet, the act of giving confirmed status or gave prestige to the giver (Romanoff 1992:474). Often giving and consequent creation of inequality was mitigated by face-saving devices, such as giving food through children or women, or leaving scraps. Importantly, once the meat was dried, it was not shared. Romanoff claims that hunter’s prestige was associated with ecologically adaptive functions, related especially to the inconsistencies in salmon dispersal and abundance, and as noted above, problems with preservation conditions. As Romanoff (1992) notes, hunting complemented fishing.

Deer hunters employed deer fences, snares, dogs, and bow and arrows, as well as hunting knives, clubs, canoes, and multiple moccasins (Romanoff 1992). Deer were
hunted from early September, just after salmon harvest, to the first full moon in
November when deer begin to rut. This was a time when male deer were fat, slow and in
general, easier to hunt.

Hunting parties would camp in the mountains for a few months in the fall. Deer
meat was cut into large portions (front quarter, ribs, etc.) and staked around a fire to dry
and then smoked on wood platforms built over fire. The dried or smoked meat was then
transported back to villages where, if properly stored, would last up to six months. For
meals, meat was chopped up and put in stews. Bones of deer were used as tools, and
stomach contents were used as ointment and a condiment.

**Geophytes:** Of particular importance to the inhabitants of the Mid-Fraser was the
utilization of wild roots (or geophytes) (Hayden 1992b; Kuijt and Prentiss 2004;
Lepofsky and Peacock 2004; Teit 1906; Turner 1992). Roots supplemented an otherwise
protein-dominated diet and was a critical stored food resource for surviving the late
winter months in the village (Kuijt and Prentiss 2004). Intensification of this resource
correlates with the establishment of large prehistoric villages during the Plateau-Pithouse
Tradition in the project area, and may have been a result of sedentism, increasing regional
population, and experimentation with sedentism. Archaeological evidence for such
intensification is seen in the abrupt increase in root digging-stick handles, root storage
caches, and root roasting ovens. Across the region, early phases of village life saw root
roasting ovens as communal features, located outside of house pits in public sphere.
Through time, root-roasting ovens and storage caches were moved inside of structures.
Root crops are located in upland environments. Near to the Bridge River site is Potato Mountain, an important root harvesting locale in the ethnographic period, exhibiting the highest productivity in the early spring through mid-summer when plants can be identified by their flowers. Often root roasting occurred at the harvesting location, and the processed material was then transported back to village site for storage (Alexander 1992). Root collecting may have been done in tandem with hunting excursions, allowing added safety to root collectors (see Prentiss et al. 2005).

Roots, like salmon and deer, are affected by fluctuations in temperature and rainfall. During wetter cooler periods, root-producing meadows are overcome by forest expansion substantially lessening their productivity. Inversely, warmer and drier periods result in the expansion of open meadows and thus increased productivity of roots. Between 1800-800 BP, the early dates of Bridge River, more root-roasting facilities are found within regional villages and tend to be larger. After 800, there is a trend towards more and smaller root-roasting facilities. According to Kuijt and Prentiss (2004), these trends may be linked to climatic changes. Warmer drier conditions allowed aggregated villages to flourish by supplementing a salmon-based diet with roots. After 800, however, wetter conditions depleted root productivity, and forced communities to disperse into smaller mobile groups.
4. Theory

4.1 Introduction

This chapter begins with a definition and review of complex hunter-gatherers and then explores two important theoretical concepts utilized and assessed by the current study. One involves resource intensification, a model often associated with human behavioral ecology (HBE), used in explaining the choices hunter-gatherers make to target and consume certain prey species. Second, in terms of sociocultural changes that occur at the site, a discussion of processes important in the transition from egalitarian systems to institutionalized inequality is presented. A review of previous research conducted at the Bridge River site concludes the chapter.

4.2 Complex Hunter-Gatherers:

Amid growing recognition of the diversity and variation across ethnographic and prehistoric hunter-gatherer societies (Kelly 1985), complex hunter-gatherers are becoming the focus of increasing archaeological research and inspiring movements in new theoretical directions (Ames and Maschner 1999; Arnold 1996; Bar-Yosef 2007; Bar-Yosef and Cohen 1991; Habu 2002, 2004; Hayden 1997; Prentiss and Kuijt 2004; Price and Feinman 1995). Often termed transegalitarian (Hayden 1997), or transitional societies (Arnold 1996), complex hunter-gatherers maintain semi-sedentary or sedentary settlement strategies; utilize food processing and food storage technologies allowing for
the accumulation of surplus food resources; occupy large, aggregated communities; often maintain private ownership of food and food resource locations; utilize non-kin labor; and most notably, often exhibit ascribed social inequality (Arnold 1996). These societies are correlated with a florescence of art traditions (Jomon), prestige goods and foods (Northwest Coast, Plateau); ritual structures (Poverty Point); and even incipient experimentation with plant cultigens (Natufian). To cite an example, the emergence of prehistoric complex hunter-gatherers along the Northern Northwest Coast (often called the Developed Northwest Coast Tradition (Matson and Coupland 1995)), shows the presence of elaborate prestige items, notably copper breastplates and chilkat blankets; food storage features; and a formal artistic style, as well as a three-tiered social structure comprised of slaves, commoners and elites. The Developed Northwest Coast Tradition led directly into the rich and varied ethnographic cultures of the region including the Tlingit, Haida, Coast Salish, Tsimshian, and Kwakiutl and interior groups such as the St’át’imc, Thompson River, and Carrier (Matson and Coupland 1995; Prentiss and Kuijt 2004b).

What is remarkable about the emergence of complex hunter-gatherers is that they mark the interruption of a highly mobile, egalitarian socioeconomic strategy (Bauplan) that had been in place across the globe for over two million years (Hayden 1997; Wiessner 2002). Breaching this threshold enabled a sequence of profound cultural changes. In the Near East, Natufian complex hunter-gatherers were the necessary transitional step between mobile foraging groups and the first farming communities (Bar-Yosef 2007), eventually giving rise to state systems. To Renfrew (2001:131), the first complex hunter-gatherer experiments with sedentism may have even brought about a
change in human consciousness and cognition, as more sedentary groups established new
relationships with the material objects around them and grew to be defined through them.

Theories that have been proposed for the emergence of complex hunter-gatherers
include human agency theory (specifically aggrandizer theory) (Hayden 1990, 1995,
1997), as well as Marxist theory, seen in the discussion of conflict between class relations
and in the exploitation of nonkin labor within the Chumash (Arnold 2001, 2004). Ames
and Maschner (1999) see the necessity of higher levels of managerial organization in
increasingly complex cultural systems of the Northern Northwest Coast as the driving
force for such change.

Chatters and Prentiss (2005), Prentiss et. al (2005), and Prentiss and Kuijt (2004b)
use Darwinian evolutionary theory to explain the emergence of complex hunter-gatherers
in the Mid-Fraser, B.C. After 8000 years of highly mobile foraging settlement patterns,
the Plateau saw the sudden emergence in 3500 bp of large aggregated villages, as well as
the development of a rich material culture that included prestige items such as nephrite
adzes and anthropomorphic mauls, and trade items such as dentalium shell from the
coast. There is evidence of ceremonial feasting events similar to those held at funerary
potlatches of the ethnographic period (Hayden 1997), and by 1200 bp there emerged the
beginnings of institutionalized social inequality (Prentiss et. al 2007).

The late-occurrence of this remarkable culture change in the Northern Plateau and
Northwest Coast allows the archaeological record to be supplemented with ethnographic
data, enriching greatly our understanding of the past. The continuing contributions by
living First Nations peoples still residing in the region and practicing many traditional
lifeways continue to benefit archaeologists. Western north American Complex Hunter-
gatherer cultures, including those of the Mid-Fraser and the Southern California Chumash (Arnold 1996), are critical to our understanding of similar, older cultural transitions across the world and which occurred deeper in time such as the foraging to farming transition occurring in the Near East 12,000 BP and the emergence of the Jomon culture on the Japanese archipelago 10,000 BP.

4.3 Resource Intensification:

The emergence of complex hunter-gatherer societies is often correlated with an intensification of local food resources (e.g. Arnold 1996; Broughton 1994; Hayden 1991,1997; Prentiss and Kuijt 2004b). Some see this as a response to increased population within a region, and subsequent circumspection and restricted mobility (Broughton 1994). Others view technological innovations which enable the mass harvesting of r-selected species characterizing times of abundance (Hayden 1991). Other factors may include the disappearance of primary food resources and the subsequent necessity of targeting more local and less optimal food resources. The subsistence choices which the inhabitants of the Bridge River Site made throughout the history of the village may be framed in these terms.

Human Behavioral Ecology (HBE) (Bettinger 1987; Cronk 1991; Jochim 1976; Kelly 1985; Smith and Winterhalder 1992; Winterhalder and Smith 1981) is a theoretical framework often used to explain the behaviors and decision-making strategies of hunter-gatherers. Drawing on microeconomic studies, HBE maintains that foraging behavior is patterned and predictable when viewed in terms of cost-benefit analysis. It is in our
genetically determined behavior to weigh costs and benefits when making foraging decisions, optimizing our food resources in terms of which foods we choose (prey choice), how diverse a diet we choose (diet breadth), how mobile we choose to be, or how long we reside within a food patch before moving to another (patch choice).

The prey choice model asserts that there are optimal food resources within an ecosystem that, if targeted, maximize a foraging group’s pay-off in calories, while minimizing search time, danger, and other costs in acquiring that food. These optimal food resources are ranked in these terms, with usually the largest-sized animal in an environment being the most highly ranked. Early in prehistory, it is deer, elk, and moose which are the highest ranked food species within Northern Plateau environments, requiring little search time and with massive meat/caloric rewards. Later with technological change, the efficient mass harvesting of anadromous salmon with nets, elevated salmon to the highest-ranked food resource, providing the most amount of calories for the least cost (Hayden 1992b; Kew 1992; Schalk 1977).

Resource intensification is a process by which human groups are able to produce more food calories within a relatively smaller catchment area, often through expending more energy in harvesting and processing (Boserup 1966; Broughton 1994). Often this is associated with a decline in the residential mobility of groups, possibly due to increased regional population and resultant circumspection or territoriality. In such conditions (like a sedentary village at Bridge River), high-ranked food resources may easily become over-exploited forcing communities to intensify the collection/processing of lower-ranked food species, requiring more energy expenditure in search and processing costs. The Archaic period throughout North America (ca 6000-2000bp) is considered to be a period
of intensification of resources as large game disappeared from the landscape and human population growth was exponential (Prentiss et. al. 2008). Explanations for the emergence of agriculture in the Near East are often couched in terms of resource intensification, a forced response to high populations which limited mobility coupled with the shrinking of foraging areas due to postglacial rising of the Mediterranean and flooding of western Levant (Bar-Yosef 2007; Bar-Yosef and Cohen 1991). This situation required that lower-ranked/high cost early cultigens be used to ensure survival. Only later did cultigens such as wheat and barley develop into optimal food resources.

In a form of resource intensification called *extensification*, human groups who have lost access to their primary food resource, resort to an increased diversity of lower-ranked species. Resource extensification has been recorded prehistorically by Broughton (1994) in the Sacramento River area. Through time, smaller and more diverse fish and mammal species were relied upon for subsistence whereas earlier sites show more reliance on larger-sized and less taxonomically diverse food species. Broughton suggests that such changes were brought about by increasing regional populations which limited residential mobility and over-exploited the larger sized and higher ranked food resources. Prentiss et.al (2007), see a similar occurrence of resource extensification at the Keatley Creek site, a large aggregated winter village contemporaneous with the Bridge River site, and located only 10 miles away. Prentiss et.al (2007) note an abrupt decline in the dominant, highest-ranked food resource, salmon, at the village at 1200bp. Subsequent faunal deposits show a shift to a more diverse food base, consisting of medium and large-sized terrestrial mammals. Such a form of intensification allowed the community to survive without reliance on salmon for 200-300 years.
Another important variant of resource intensification in our discussion is *specialization* (Butler and Campbell 2004), and may correlate with the shift from more mobile settlement patterns to sedentary ones across the Northern Plateau. Unlike *extensification* which occurs in times of stress, resource *specialization* tends to be associated with times of plenty. *Specialization* entails the narrowing of the resource base to only a few subsistence staples and is often associated with new technologies which allowed the mass harvesting and storage of a food item. In the Northwest Coast and Northern Plateau, specialization of anadromous salmon occurs as early as 4000bp. This allowed the intensification of food resources within a limited catchment area, and contributed to more sedentary residential patterns, and in many ways, has grown to define these cultures.

4.4 Egalitarianism and Social Inequality:

Much of this study concerns the prehistoric cultural transition from egalitarian socio-economic systems to systems exhibiting status inequality, as they can be identified through an analysis of the fauna. As stated above, mobile foraging groups practicing egalitarian social organization lived in the region for 7000 years before the abrupt shift to large semi-sedentary aggregated villages and later institutionalized social inequality c.a. 1200bp. This section will attempt to better understand what is meant by these concepts. Most studies of complex hunter-gathers are concerned with this transition, and consider emergent complexity or transegalitarian societies a gateway to regional polities and even state societies (Arnold 1996).
Egalitarianism, the dominant social organization of mobile foragers across the world, is defined simply by Wiessner (2002) as equal access to food resources. Archaeologically, this should be seen in the equal distribution of all food resources across a community. Such a system encourages safer existence in uncertain environmental situations. An ethos of sharing, strong kinship ties, unrestricted movement, and equal access to foods lessens these uncertainties (Lee 1993). Egalitarianism coupled with high residence mobility has been the primary cultural lifeway since the appearance of anatomically modern humans 2 million years ago (Bettinger 1987; Binford 1980; Hayden 1997). Many previous studies incorrectly view egalitarianism as a simple institution characterized by a lack of structure, a natural sociocultural default. According to Wiessner (2002), citing Tiger and Fox (1970), humans and most other primates are naturally stratified species, i.e. it is in our nature to generate status hierarchies. Egalitarianism then is an active and complex system designed to mitigate social inequalities which may naturally arise within hunter-gatherer groups and which may be detrimental to overall survival of the community. An egalitarian ethos characterized by the equal distribution of food resources, reciprocal sharing, intermarriage, and free ranging movement are thus adaptations to survival. Rules of behavior focus on the suppression of greed, personal aggrandizement, inequality are embedded into the social behavior of groups at the earliest of ages, constructing habitus, or structureless structure (Bourdieu 1977) within which individuals live their lives, and ensures survival in a relatively mobile foraging social environment. “Habitus generates perceptions, expectations, and practices that correspond to the structuring properties of earlier socialization. An individual’s habitus is an active residue of his/her past that functions
within the present to shape his or her perception, thought, and bodily comportment,” (Swartz 2002:617). As Wiessner (2002) affirms, egalitarianism is itself a complex system of structureless structure, thought to be embedded into a suite of evolutionarily selected behaviors within hunter-gatherer societies. Any threat to such a system, especially as it concerns aggrandizing, hoarding or ownership of resources, would be immediately curtailed. Any attempted change to such a system would encounter much resistance, and indeed would be seen as a rejection of society and a threat to a group’s survival.

In the archaeological record throughout the Plateau, egalitarian social organization was embedded into a highly mobile settlement-subsistence pattern from the earliest prehistoric inhabitants at 11,000 BP up to 3000 BP, fostering a climate in which social and material discretion was the rule. Egalitarianism in the Northern Plateau allowed elaborate forms of cooperation, including networks of mutual support based on kinship that extended far outside the local group.

According to Hayden (1991,1995), transitions away from egalitarianism must occur within select environmental conditions that include abundant, even inexhaustible food resources coupled with the technology to both mass harvest and store the foods. Such rich conditions, often focused on r-selected resources, begin to break down the sharing ethos as an abundance of food lessens the stress of a community, opening the door to an allowance of wealth accumulation and the eventual transference of wealth into prestige, possibly through feasting events such as potlatches.

Ground-breaking work by Lepofsky et. al (1996) uses the distribution of faunal material to identify emergent inequality within three housepits at the Keatley Creek site, a
contemporaneous village site 10 miles from Bridge River Site. As indicated above, social inequality is often correlated with the unequal distribution of food resources across a community. In the larger pithouses at Keatley, it was revealed that faunal material was unequally distributed between the various domestic sub-areas/activity areas across the floor surface. Such areas are thought to represent discreet family groups residing in a common house, i.e. making up the components of a household corporate group. Deer bones were concentrated in the southwestern area of the house, and correlated with presence of prestige items such as nephrite adzes, ornaments, etc. Chinook salmon remains were also concentrated in this portion of the house, whereas sockeye salmon remains were more evenly distributed across the house. Though there is some disagreement about their dates (Prentiss et.al. 2007), Lepofsky et. al (1996) conclude that social inequality was present within the house, and that an elite family resided in the southwestern portion of the structure. Medium and smaller pithouses in their study exhibited little socioeconomic differentiation in the distribution of faunal material. The research conducted in the current study is largely inspired and modeled after the work of Lepofsky et al. (1996).

Lepofsky et al.’s findings correlate with other studies seeking to identify complexity in the archaeological record, including analyses of mortuary features by Schulting (1995), regional trends in the Upper Columbia region by Goodale et. al. (2004), and regional over views by Prentiss et.al 2005). All studies indicate the dominance of an egalitarian forager pattern until roughly 3500 BP, at which point a collector-based economy is put into place characterized by logistically-organized forays, increased sedentism, and storage of food items. Soon thereafter occurs the emergence of
complex societies throughout the Northern Plateau sometime between 2000 and 1500 BP, exhibiting various levels of increased social inequality. By the late prehistoric period and continuing into the ethnographic period, social inequality is deeply embedded in societies throughout the Northern Plateau and the Northwest Coast.

4.5 The Bridge River Site

Bridge River Site (EeRI4) is a large aggregated prehistoric village containing over 80 circular housepit depressions (Figure 4.5.1). It is situated on a flat river terrace rising from the north edge of Bridge River, approximately 5km upstream from the confluence of Bridge River and the Fraser River. As noted above, the confluence area is a prime fishing location known as Six Mile rapids (Sxetl), just downstream from Fountain rapids. Together, these fishing locations are the most productive fishery in the Canadian Plateau (Kennedy and Bouchard 1992; Kew 1992; Romanoff 1992). Housepits at the site are grouped tightly together, often with rim edges in contact with one another. Substantial midden-rims have accumulated around the edges of the pithouses. Housepits vary in size from 5 to 16m in diameter and extra-mural roasting pits are
Figure 4.5.1. Planview of Bridge River Site. Excavated houspits in grey.

scattered intermittently across site. It is one of nearly 20 similar and contemporaneous prehistoric villages in the region that include Keatley Creek site, Bell site, and McKay Creek site. The Bridge River village is identified on early maps and apparently was occupied during the ethnographic period (Ryder 1978).

Initial site testing and recording of the Bridge River site began in 1974 with Arnoud Stryd. The University of Montana 2003, under the leadership of Dr. Anna Marie Prentiss began a long-term analysis and excavation of the site in collaboration with the
Bridge River Band. The current study is a continuation of this program. In the 2003 and 2004 field seasons, crews excavated 50cmx50cm probes in all 80 of the pithouses at the site to acquire datable materials from floor contexts and established a chronology, or history, of the village. Four periods were identified in the testing phase: Bridge River 1 (BR 1), BR 2, BR 3, and BR 4 (Table 4.5.1 and Figure 4.5.2). BR 1 includes the inception of the village at 1800bp, and is characterized by a loose cluster of seven housepits. Bridge River 2 sees an expansion of the village and a marked increase in numbers of housepits to 17. Population at the village reaches its apex during BR3, with 29 housepits in use at the same time. Interestingly, it appears that housepits cluster into two U-shaped arrangements, possibly representing two clan groups (Prentiss et.al 2008). The village is abruptly abandoned at the terminus of BR3, 1100bp. Following a hiatus of 200 years the village is re-inhabited at 400bp, but occupations are sparse and non-intensive. Field work during both 2008 and 2009 have confirmed the dates established in the 2008 publication.
Figure 4.5.2. Bridge River chronology (taken from Prentiss et.al 2008).

Geophysical surveys conducted by Cross in 2005, identified activity areas within specific houses which were then chosen as locations for excavation blocks. These activity areas consist of hearth and storage features and are thought to represent discreet living areas of family groups residing within multifamily subterranean structures (Hayden 1997; Teit 1906). Multifamily residences, or corporate households, were common in the ethnographic period (Teit 1906) and are evidenced as early as 1700 BP at Housepit 7 at the Keatley Creek site (Prentiss et. al 2007).

Excavations at the Bridge River site during the summer field season of 2008, from which the current faunal assemblage was acquired, targeted activity areas within three housepits of varying size: housepits 20, 24, and 54. Houses 54 and 20 contained multiple
layerings of prepared floors, each comprised of fine hard-packed clay, while Housepit 24 contained only a single floor. Each floor surface from all pithouses contained abundant refuse including lithic and faunal material. Cache-pit features originated from many of the floor surfaces, and were commonly filled-in prehistorically with floor refuse prior to the resurfacing of the next floor. One cache pit in housepit 54 had an estimated volume of 1,360,012 cm³. Often fire-pits were placed over the filled-in cache pits. Burned and collapsed roof deposits occur throughout the stratigraphy separating clusters of floor deposits. Moreover, micromorphology studies and C-14 dating has indicated that floors were used for an average of 15-45 years, before being over-laid by a later floor. Roof-collapse and house-burning episodes occur approximately every 100 years (Prentiss et. al 2009).

Table 4.5.1. Bridge River Chronology.

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of</th>
<th>Date Range</th>
<th>Housepits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge River 4 (BR4)</td>
<td>610-145 cal. B.P.</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Bridge River 3 (BR3)</td>
<td>1275-1100 cal. B.P.</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Bridge River 2 (BR2)</td>
<td>1552-1326 cal. B.P.</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Bridge River 1 (BR1)</td>
<td>1797-1614 cal. B.P.</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Pre-Bridge River (Pre-BR)</td>
<td>2538 cal. B.P</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Housepit 20 is a large housepit located in the center of the site measuring 18m in diameter and exhibiting a substantial rim midden. Two excavation blocks were placed over subsurface activity areas. Three floors are associated with BR2 deposits, and 3 were associated with BR3. All floors contained faunal material.
Housepit 24 is a large-sized housepit located on the southern edge of the site. It measures 16 meters in diameter with a low rim midden. The housepit contained only a single floor surface dating to BR3. Three excavation blocks were excavated over activity areas.

Housepit 54 is a medium-sized housepit located on the northwestern edge of village. Excavations in three excavation blocks revealed 14 floor surfaces spanning BR2, BR3, and BR4. Five floors are associated with BR2, five with BR3, and four with BR4. Since the current research is focused primarily on the BR2 and BR3 phases, only data for these phases will be presented. The excavated volume sediment for each of the archaeological contexts is presented in Table 4.5.2 (and in Appendix A).

Table 4.5.2. Total cubic meters excavated for BR2 and BR3, 2008.

<table>
<thead>
<tr>
<th>Housepit</th>
<th>Total (m3)</th>
<th>By Bridge River Phase (BR):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>for BR2,BR3</td>
<td>BR2</td>
</tr>
<tr>
<td>20</td>
<td>1.88</td>
<td>.94</td>
</tr>
<tr>
<td>24</td>
<td>2.11</td>
<td>n/a</td>
</tr>
<tr>
<td>54</td>
<td>3.24</td>
<td>1.21</td>
</tr>
<tr>
<td>Total:</td>
<td>2.15</td>
<td>5.08</td>
</tr>
</tbody>
</table>
5. Analysis

5.1 Introduction

Measurements of faunal abundance and diversity are used to test hypotheses concerning shifting trends in subsistence behaviors as well as environmental resource depression, and emergent social inequality at the Bridge River site. It is argued that secondary-ranked food resources such as deer and other terrestrial mammals declined in abundance and in richness throughout the subsistence history of the village and may be attributed to local resource depression. Reliance on anadromous salmon (*Onchorhynchus nerka*) remains the dominant food resource, comprising 96% of the identified fauna.

The second part of the analysis is concerned with emergent social inequality. Increasing variation in the spatial distribution of deer elements indicates differential access to certain food resources beginning in BR3. Correlation between deer elements and prestige items grows in BR3. What follows is a discussion of the three hypotheses and counter-hypotheses used for this study, followed by the methods of analysis, and the results of the analysis.

5.2 Hypotheses:

1) *Inhabitants of the Bridge River site intensified salmon as a primary food resource throughout the history of the village, resulting in a narrowing of diet breadth. A counter-hypothesis is that resource extensification occurred, characterized by the broadening diet breadth of local, lower-ranked food resources.*
2) Human population growth within the Bridge River site during BR3 coupled with the region’s first experiments with sedentism resulted in resource depression of local deer populations. A counter-hypothesis is that the village had no impact on the deer populations within the local environment.

3) Social differentiation emerged late in the history of the Bridge River site, a result of contingent evolutionary processes (Prentiss et al. 2007, 2008). Faunal indicators of complexity include unequal distribution of general food items and the emergence of prestige foods (food items associated with prestige goods). Faunal variation is expected to grow more pronounced through time both between pithouses and between domestic sub-groups within multifamily structures. A counter-hypothesis is that social inequality was present at the onset of the Bridge River village (see Hayden 1997, 2005).

Through an analysis of the Bridge River fauna recovered during 2008 excavations, this research was conducted to test the hypotheses and counter-hypotheses posited above: (1) track subsistence change, (2) identify resource depression, and (3) discern evidence of emergent social inequality throughout the 700 year history of the complex hunter-gather village.

The current study tests whether inhabitants of the Bridge River site practiced intensification of food resources, characterized by a narrowing of prey choice items, resulting in a salmon-based subsistence economy (Hypothesis 1). Butler and Campbell (2004) call this process specialization and note that it often signifies an increase in foraging efficiency. A counter-hypothesis is that instead of a narrowing of prey choice through time, there was a broadening in the richness and evenness of the lower-ranked species consumed, a concept called extensification often characterized by a decline in foraging efficiency. This counter-hypothesis is modeled after the work of Broughton (1994) (see Chapter 3).

If Hypothesis 1 is correct, it is expected that the earliest occupations at the Bridge River site contain fauna with higher levels of richness and evenness. Through time, it is
proposed that inhabitants practiced intensification and narrowing of the subsistence choice, towards a reliance primarily on salmon and roots (Prentiss and Kuijt 2004b). Across the Northwest Coast and Northern Plateau, specialization was made possible by technological innovations in the mass harvesting, drying and storage of salmon and by foraging shifts to logistically organized forays targeting specific taxa (Hayden 1992b; Matson and Coupland 1995; Prentiss et. al 2005). In such cases, mass harvested prey items become the highest ranked prey choice, supplanting larger-bodied terrestrial species in importance. A shift in prey choice may also be the result of resource depression of certain food items.

One factor which may have contributed to the subsistence change within the community is that deer and other terrestrial mammals were gradually over-exploited within the local environment (Hypothesis 2). Effects on the local ecosystems from expansion of large aggregated villages and increased regional populations during the Plateau-pithouse tradition (Goodale et. al. 2004; Hayden 1992, 1997; Prentiss et. al 2005, 2007, 2008; Rousseau 2004) must have been severe, especially considering that these were the first experiments with sedentary life in the history of the area, where small mobile groups had long predominated. Butler (2000) discusses growing resource depression within the adjacent Northwest Coast culture area during the late Prehistoric period as large winter villages also increased in size and abundance. In both the Northwest Coast and the Northern Plateau, salmon populations were generally predictable and at times inexhaustible, while deer and other terrestrial mammals were more susceptible to resource depression (Butler 2000). Resource depression, it should be
noted, often operates as a local phenomenon for prehistoric communities (Prentiss 2010, personal communication).

At the Bridge River site, it is hypothesized that given the less productive deer habitat of the local area (Alexander 1992; Kew 1992; Prentiss 2009), such a large village may not have been sustainable given the increasingly extreme fluctuations in yearly salmon spawns (Kew 1992; Romanoff 1992), possibly associated with the warming of the region beginning at 1100bp (Bochart 2005). Specialization, which was initially a successful subsistence adaptation, may have inadvertently led to resource depression of lower-ranked/secondary terrestrial resources throughout the 700 years of history. With a late period decline in salmon populations, there were insufficient food resources to fall back on. In other words, localized events of resource depression of secondary food resources may have had catastrophic results for communities, like Bridge River, which grew too narrowed in their subsistence strategies.

**Hypothesis 3** is concerned with emergent social complexity. Variation in spatial patterning of faunal material, an indication of unequal access to certain foods, is expected to increase with time at the Bridge River site, not only between houses but between domestic sub-groups residing in the multi-family structures. As noted above, Lepofsky et.al. (1996) were able to discern evidence of social differentiation through an analysis of the distribution of fauna at the Keatley Creek site, a village comparable to the Bridge River site in size and period of occupation. Indicators that they identified and which are assessed in the present study include: 1) unequal distribution of faunal abundance between pithouses and within multi-family pithouses, 2) spatial patterning of prestige
foods, and 3) association of prestige foods with prestige items such as nephrite adzes and trade goods.

The current study tests the hypothesis that complexity was not present at the beginning of the Bridge River Village, but that it developed late in its history, just prior to abandonment. According to the hypothesis, Bridge River, then, signifies an in situ development of complexity, possibly explained by a combination of evolutionary and historically contingent factors specific to the history of the village (Prentiss et. al. 2007, 2008), and, as deer became more scarce in the region their status as a prestige food/potlatch food may have come into play. This would be seen archaeologically in the uneven distribution of deer parts, and the correlation with prestige items and elite activity areas late in the history of the village.

A counter-hypothesis based on Hayden’s (1995, 1997) aggrandizer model contends that complexity, indeed the complete regional shift to collector-based economies across the Northwest Coast and Northern Plateau, was driven by aggressive, power-seeking individuals (an agency-based theory). Through control of non-kin labor, such aggrandizers may have secured ownership of fishing locations and other resource localities, resulting in the unequal accumulation of abundant stored food surplus. Such wealth could then be transformed to prestige through competitive feasting events and complex debt manipulations, often manifested in potlatch ceremonies (Hayden 1995; Teit 1906). Support of this counter-hypothesis would be expressed in faunal evidence of socioeconomic differentiation at the inception of the village and would be expected to remain constant throughout its history.
5.3 Methods

Faunal data for the current research were acquired from the broader faunal analysis completed for the 2008 excavations at Bridge River site (Carlson and Schremser 2009) (see Appendix B for database). Carlson and Schremser analyzed the assemblage at the Department of Anthropology lab facilities at the University of Montana, Missoula, MT. Comparative collections and critical assistance were provided by David Dyer, curator of the Philip L. Wright Zoological Museum at the University of Montana. In their analysis, 100% of the faunal material was analyzed for taxonomic class, species, and element. Where possible, specimens were identified down to sub-species classifications. Human modification to bones was assessed, which included identifying evidence of butchering and processing techniques such as burning, cut-marks, chopping, hacking, and fragmenting morphology (Reitz and Wing 1999). Additional human modification of fauna was recorded and included alterations to bones for use as formal tools such as awls, needles, ornaments, etc. or various stages of their manufacture. Non-fish faunal material fragments were categorized into 6 size grades (1-9mm, 10-19mm, 20-29mm, 30-39mm, 40-49mm, 50-59mm, and 60+mm). Variation in size grades of fauna through time and across space may indicate shifting trends in butchering and processing techniques (Figure 5.3.1). Diameters of complete Oncorhynchus sp. vertebrae (thoracic, precaudal, and caudal) were recorded. Other fish elements were not measured. In addition, all fauna were weighed by taxonomic class for each archaeological context.
In the current study, measuring faunal abundance was done through the standardized practice of determining number of identified specimens (NISP) and bone weight (Cruz-Uribe 1984; Grayson 1979, 1984; Lyman 1979; Reitz and Wing 1999). NISP is a number count of each bone fragment classified by taxonomic category. NISP was calculated for all identified species, and separated into size-grades. For those bones not identifiable to species, specimens were assigned to broader animal-size categories: small, medium and large-sized mammals. Small sized mammals include mouse and squirrel-sized animals. Medium-sized mammals include dog to rabbit-sized animals. And large mammals include deer and elk-sized animals. Excavation techniques allowed for all NISP to be separated by stratigraphic layer, excavation area, and housepit.

Grayson (1979, 1984) has determined that NISP is the most appropriate way to quantify archaeofaunal material. Other techniques, such as relying on MNI (minimum number of individuals), produces unwarranted variation based on the defining of contexts/analytical units that it is not applicable at the Bridge River site. Two factors are illustrative. The faunal material was highly fragmentary in nature, and relatively few specimens were able to be categorized by element and side. Secondly, sample size was so small, both at the house level and site-wide, that a fair assessment of any given
context, however that may be defined, was unattainable. Short-comings in the use of NISP have been highlighted by Lyman (1979). He states that variation in bone densities between species as well as within a single skeleton affect their rate of preservation, thereby biasing what survives into the archaeological record. Differential densities and variation in weathering conditions effect how fragmented bones may become (i.e. highly weathered bones are more prone to breaking into multiple pieces, each piece then being counted singularly. Following Lyman (1984), we determined that element frequencies for Bridge River Phases 2 and 3 were not correlated with bone. Better preserved elements are less likely to break down into multiple NISPs). Lastly, different species may have parts which are more likely to survive than others. The carapace of a turtle is more likely to survive buried conditions (and fragments severely). Teeth survive, while soft collagenous vertebrae often do not.

The second measure of faunal abundance is weight (Grayson 1979, 1984; Lyman 1979; Reitz and Wing 1999). Quantifying fauna by weight attempts to overcome some of the fragmentation issues of NISP, and is best done as a supplemental measure to NISP calculations (Grayson 1979, 1984). Weight was measured by class for all contexts in the current study, and was used to reaffirm trends seen in NISP. Lyman (1979) notes the one major shortcoming of weighing fauna is that variation in mineralization/weathering stages of fauna can greatly skew the results. Often mineralized specimens weigh more than non-mineralized items. Calcined bone is often lighter than non-calcined, and advanced weathering of bone lightens the composition through depletion of water weight.

The recording of taphonomic characteristics also aided in highlighting awareness of possible confounding variables or “background noise” inherent in site formation
processes (Gifford 1981). Such characteristics included assessing the degree of bone weathering. Following Behrensmeyer’s (1978) criteria, bones are separated into five categories of increasing weathering stages. It was found that deposits from the later phases (BR4), showed more weathering than earlier, more deeply buried deposits (BR2 and BR3). As noted above, this may be a result of earlier deposits being more protected by subsequent layering of later clay floors which acted to seal faunal material in relatively anaerobic environments. Later stratigraphic contexts nearest the ground surface are susceptible to a combination of ground water leaching down into the sediment as well as surface disturbances such as rodent burrowing, roots, and looting. Importantly, little variation in weathering stages is noted between BR2 and BR3, the phases compared in this study. (Figure 5.3.2).
In order to account for biases occurring when comparing faunal material from two contexts of unequal volume, cubic volume excavated (m³) was divided into each faunal measure of NISP (see table 4.5.2 for volume of sediment associated with housepits and phases; Appendix A for a complete breakdown of volume excavated by stratum). Such a calculation produces a relative density of NISP occurring within a standard volume of sediment which can then be compared across contexts.

Measures of taxonomic diversity were used to assess the hypothesized narrowing of the diet between BR2 and BR3. This procedure was intended to test for the gradual specialization of the Bridge River diet, often associated with an abundance of the primary food resource. Taxonomic richness was calculated for each housepit by occupational period. This is simply a count of each of the species represented in a sample (Reitz and Wing 1999). Secondly, the Shannon-Weiner index developed by Pielou (1966) was used to measure taxonomic evenness for each housepit by phase. Evenness takes into consideration the relative abundance of each of the species represented within a sample.
For example, high evenness is seen if three species were identified in a sample, each occurring 5 times. Low evenness is seen if three species were identified in a sample with one occurring 13 times and the other two, one each. For the Bridge River assemblage, measurements of faunal diversity directly relate to the diet of the inhabitants. High evenness and high richness would suggest a varied diet in which different food resources were equally utilized signifying a broad diet breadth. Alternately, low evenness and low richness would suggest reliance on a dominant food staple with few supplemental foods, and indicating an highly-targeted pursuit strategy (Chatters 1987).

In the current study, utility indices for deer elements were used to assess local resource depression. Mammal utility indices have been established to rank the Kcal return for various portions of hunted mammals. Originating with Binford's General Utility Index (GUI) (1978), and later Modified General Utility Index (MGUI), meat weight, grease content, and marrow volume were calculated for various bones of prey animals. Thus the bones surviving into the archaeological record can be seen to represent more than simply the taxonomic species hunted, but can reveal decision making processes of individual hunters concerned with optimizing balance between caloric return benefits and costs. Subsequent studies have refined Binford's MGUI (Metcalfe and Jones 1987), and calculated economic utility for additional prey items such as deer (Madrigal and Holt 2002). The idea being that the complete deer carcass of an animal hunted locally would be transported back to the site, and be represented archaeologically in the complete skeleton comprised of high, moderate, and low utility portions (Based on Madrigal and Holt 2002). If resource depression occurred, hunters would theoretically be
forced to travel farther distances to kill a deer, and would then transport only high-utility portions the long distance back to the village.

More detailed insight of utility indices can be derived from an examination of Minimum Animal Units (MAU). MAU is a measure of NISP which takes into consideration Minimum Number of Individuals (MNI) for any faunal assemblage. MAU is derived by dividing the number of elements in an assemblage for a particular species by the total number of that element as it occurs in a complete skeleton.

Lastly, assessments are made of co-occurrences between deer elements and prestige goods such as nephrite adzes, anthropomorphic mauls, ornaments, copper, and trade items from the Coast such as dentillium shell for BR2 and BR3. Teit (1906) and Hayden (1997:130), assert that prestige items were an important aspect of traditional St’át’imc society and were used as symbols of power, often defining social relations by establishing visual cues to separate status groups within a community (Binford 1962). At the Bridge River site, five items were identified as being prestige items and thus possibly associated with elite families. These are nephrite adzes, bone ornaments, beads, art objects, and metal items.

Confounding factors for the study include most saliently the small sample size. Approximately five percent of each housepit floor was sampled and used for the current study. Also, only three housepits were sampled. Ideally, a larger representation of houses and floor deposits should be used. The current research, then, may be viewed as an initial attempt at understanding faunal material and associated behaviors at the Bridge River site. The recognition of trends in the current study needs to be assessed and refined through additional field work at the site. Recent criticism of the Bridge River
excavations by Hayden and Mathewes (2010), has pointed out these very issues. However, his faulting of the excavations for not penetrating into outer rim deposits is unfounded. The layered floor deposits and the abundant cultural material contained on them at the Bridge River Site are indeed sufficient for studying diachronic culture change.

6. Findings

6.1 Introduction

Results of the analysis are presented in three parts corresponding to the three hypotheses. The first section assesses subsistence change throughout the entire early history of the Bridge River Village. Second section assesses resource depression and how that may have influenced subsistence change. And the third section assesses emergent status inequality through the distribution of fauna at the site.

6.2. Subsistence Change (Hypothesis 1):

Analysis confirms that salmon is indeed the primary food resource throughout the 700 year early history of the village (BR2, BR3) (Table 6.2.1; Appendix B). This is seen in the relative abundance of salmon to other taxa across the site. When salmon remains are isolated and assessed diachronically, however, they appear to decline. These findings
are in contrast to other evidence for increasing salmon intensification at the site, notably
dramatic increases in the volume of salmon storage cache pits, increases in abundance of
salmon processing lithic tools, and exponential growth in village size seen in BR3.
Cultural explanations may account for the discrepancy between these factors.
Ethnographic accounts by Teit (1906) describe typical winter meals of the St’át’imc as “a
handful of dried, powdered salmon mashed between stones, mixed with berries.” Seen
archaeologically, this behavior would have profound effects on the preservation of the
salmon bones. Secondly, salmon remains would inevitably be exhausted by the end of a
long winter for such a large population, and ethnographic data recount episodes of
starvation in the early spring (Kuijt and Prentiss 2004). The fact that “forgotten” stored
salmon remains are recovered from the bottoms of large storage caches in both BR2 and
BR3, beneath re-deposited floor sweepings, supports the notion that these caches were
primarily for salmon storage (Prentiss et. al 2009).

Table 6.2.1 Identified Faunal Specimens (NISP) for Housepit 20 by stratigraphic layer.

<table>
<thead>
<tr>
<th>Taxonomic ID</th>
<th>HP20:</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IId</td>
<td>Vd</td>
<td>IIc(1)</td>
</tr>
<tr>
<td>Oncorhynchus sp. (salmon)</td>
<td>151</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Odocoteus sp. (deer)</td>
<td>8</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Beaver</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Squirrel</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fisher</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aves</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Rabbit</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elk</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rodentia</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Large-sized mammal</td>
<td>43</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Med/lg mammal</td>
<td>53</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Medium-sized mammal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Stratigraphy with “II” prefix designates floor surfaces, and “V” roof collapse
episodes. The tables are arranged so that the earliest occupations occur on the left (IId)
and the latest on the right (Va).
Table 6.2.2 Identified Faunal Specimens (NISP) for Housepit 24 by stratigraphic layer.

<table>
<thead>
<tr>
<th>Taxonomic ID</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
</tr>
<tr>
<td>Oncorhynchus (salmon)</td>
<td>3391</td>
</tr>
<tr>
<td>Odocoileus sp. (deer)</td>
<td>18</td>
</tr>
<tr>
<td>Rabbit</td>
<td>2</td>
</tr>
<tr>
<td>Rodent</td>
<td>8</td>
</tr>
<tr>
<td>Canis (dog)</td>
<td>75</td>
</tr>
<tr>
<td>Ursus (bear)</td>
<td>1</td>
</tr>
<tr>
<td>Large-sized mammal</td>
<td>52</td>
</tr>
<tr>
<td>Med/lrg mammal</td>
<td>159</td>
</tr>
</tbody>
</table>

The increase in volume of salmon storage caches between BR2 and BR3 as well as the numbers of salmon processing tools, may be more appropriate measures of the importance of salmon in the Bridge River diet (Figure 6.2.1).

Table 6.2.3 Identified Faunal Specimens (NISP) for Housepit 54 by stratigraphic layer.

<table>
<thead>
<tr>
<th>Taxonomic ID</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
<td>Ia</td>
</tr>
<tr>
<td>Oncorhynchus (salmon)</td>
<td>157</td>
<td>558</td>
</tr>
<tr>
<td>Odocoileus sp. (deer)</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Beaver</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Squirrel</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mollusca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aves</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Toad/frog</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fisher</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Canis (dog)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mink</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Rodent</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Large-sized mammal</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Med/lrg sized mammal</td>
<td>27</td>
<td>52</td>
</tr>
<tr>
<td>Medium-sized mammal</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 6.2.4 Percentage Totals of Identified Taxa

<table>
<thead>
<tr>
<th>Taxa</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmon (Oncorhynchus sp.)</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Deer (Odocoileus sp.)</td>
<td>3%</td>
<td>1.50%</td>
</tr>
<tr>
<td>Dog (Canis familiaris)</td>
<td>*</td>
<td>1.60%</td>
</tr>
<tr>
<td>Beaver (Castor canadensis)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Squirrel (Tamiascurus sp.)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Fisher (Martes pennantes)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Bird (Aves)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Elk (Cervus canadensis)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Rodent (Rodentia)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Amphibia</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Bear (Ursus sp.)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Rabbit (Lagomorph)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Mink (Mustela sp.)</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

(* Less than 1% of Total)

Figure 6.2.1 Salmon NISP divided by volume and Cache pit volume by phase.
The presence of deer and large mammals in the diet declines significantly between BR2 and BR3 (Figure 6.2.2). These results are seen in the distribution of NISP for deer and large-mammal sized specimens separated out by Bridge River Phase.

The diversity of food items declines slightly from BR2 to BR3. The richness of subsistence species declines from 8 in BR2 to 5 in BR3 (Table 6.2.2). Results do not significantly correlate with sample size (BR2: n/a; BR3: \( r = -0.4, p = 0.16 \)). The fact that
richness did not increase, indeed it declined some, suggests that resource extensification did not occur at the site (as per Broughton 1994). It appears, instead that specialization as a form of resource intensification developed (or at least increased). The diet breadth appears to have narrowed substantially by end of BR3, resulting in a salmon-dominated diet. Secondary food items in the local environment appear to gradually decline in the diet.

Table 6.2.5 Taxonomic richness of subsistence species.

<table>
<thead>
<tr>
<th>Taxonomic Richness of Subsistence Species</th>
<th>HP20</th>
<th>HP24</th>
<th>HP54</th>
<th>Mean:</th>
<th>Mean/m3:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR3</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>1.18</td>
</tr>
<tr>
<td>BR2</td>
<td>7</td>
<td>n/a</td>
<td>9</td>
<td>8</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Breakdown of Species:
- Hp20/BR2: odocoileus sp, oncorhynchus, beaver, fisher, bird, squirrel, elk
- Hp20/BR3: odocoileus sp, oncorhynchus, beaver, rabbit, bird.
- Hp24/BR2: n/a
- Hp54/BR2: odocoileus sp, oncorhynchus, beaver, fisher, bird, squirrel, rodent, frog/toad, mollusca

Additional support for a continued salmon-based economy through BR2 and BR3 is seen in measurements of evenness (Figure 6.2.3). Results do not significantly correlate with sample size (BR2: n/a; BR3: $r = -1.00$, $p = 1$). Results indicate relatively similar and low evenness scores for each phase, suggesting that the Bridge River diet was dominated by a primary food resource: anadromous salmon.
6.3 Resource Depression (Hypothesis 2):

Support for the assertion that resource depression may account for subsistence change is seen in diachronic variation of deer element abundance. Analyses reveal that in the earliest phases of the village site, all parts of the deer occur in relatively equal percentages (Table 6.3.5). Cranial, axial, and pelvic limb bones are present. By BR3, however, only lower limb bones are represented in the fauna. Results suggest that deer in the earlier phase were locally abundant and that hunters were able to transport the complete carcass from the kill site back to the village. By BR3, however, deer had become scarce locally, possibly through overexploitation. Consequently, hunters were required to travel farther distances to make a kill and then make decisions about transport costs. As noted above, utility indices have been developed based on optimization models which predict the outcomes meat transport costs. It is expected that the farther away a...
kill is made, the more optimal (high utility value) will be the portions and bone parts that make it back to the village from the hunting site (Alexander 1992, 2000).

In the current analysis, results are different for the different housepits. Housepit 20 sees equal distributions in the BR2 phase and a significant shift to lower limb bones in BR3 (Table 6.3.1). Distributions of deer elements in Housepit 24 appear more evenly distributed in BR3 (Table 6.3.2).

**Table 6.3.1** Distribution of Deer Elements for Housepit 20 by stratigraphic layer.

<table>
<thead>
<tr>
<th>Element</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP20:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cranial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxilla frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-maxilla frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tooth</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Int.auditory meatus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertebral frag</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Rib frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scapula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innominate frag.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Femur frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humerus frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius frag</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Ulna frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tibia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metatarsal frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interdigital (undifferentiated)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Metatarsal frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metacarpal frag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tarsal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st phalanx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd phalanx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd phalanx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sesamoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vestigial phalanx</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Housepit 54 most clearly shows the shift in deer element distribution from the early to the later phases. BR2 sees equal cranial, axial, and limb parts. By BR3, however, there is a marked decline in the lower-value/utility parts such as those associated with the cranial and axial portions of the deer. As noted above, this may suggest that deer were abundant locally in the earliest occupations of the site, and the complete carcass was easily hauled into the village for processing. In BR3, hunters may have had to travel farther from the village to kill an animal. In such cases,

*Table 6.3.2* Distribution of Deer Elements for Housepit 24 by stratigraphic layer.

<table>
<thead>
<tr>
<th>HP24:</th>
<th>Element</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>II</td>
</tr>
<tr>
<td>Cranial</td>
<td>Maxilla frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-maxilla frag</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Tooth</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Antler frag</td>
<td>1</td>
</tr>
<tr>
<td>Axial</td>
<td>Vertebral frag</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Rib frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scapula</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innominate frag.</td>
<td>1</td>
</tr>
<tr>
<td>Upper Limb</td>
<td>Femur frag</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Humerus frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radius frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ulna frag</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Tibia frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fibula frag</td>
<td></td>
</tr>
<tr>
<td>Lower Limb</td>
<td>Metapodial (undifferentiated)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Metatarsal frag</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Metacarpal frag</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carpal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tarsal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st phalanx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd phalanx</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3rd phalanx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sesamoid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vestigial phalanx</td>
<td></td>
</tr>
</tbody>
</table>

99
only the limb parts (quarter-portions) would be brought back to the village while low-utility parts would be left at the kill or hunting camp (Daly’s Schleppe effect).

Toe bones and sesamoids in BR3 may be “riders” (Binford 1978), which are inadvertently attached to the more optimal butchered upper limb portion when transported back to the village. Prentiss (2009 personal communication) suggests that the toe bones and sesamoids possibly indicate that only hides were making it back to the village, possibly as trade items. As noted above, the distribution of bone fragments by size categories is identical between BR2 and BR3 (Figure 5.3.1), suggesting that no intensified butchering or bone processing is occurring in BR3 (This would be evidenced in a spike in smaller-sized NISP fragments).
Table 6.3.3. Distribution of Deer Elements for Housepit 54 by stratigraphic layer.

<table>
<thead>
<tr>
<th>HP54:</th>
<th></th>
<th></th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element</td>
<td></td>
<td>H k</td>
<td>H j</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cranial</td>
<td>Maxilla Frag</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pre-maxilla Frag</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Tooth</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occipital Condyle</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mandible Frag</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Axial</td>
<td>Vertebral Frag</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Rib Frag</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Scapula</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innominate Frag</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Upper Limb</td>
<td>Femur Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humerus Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radius Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ulna Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tibia Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fibula Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Limb</td>
<td>Metapodial (Undifferentiated)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metatarsal Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metacarpal Frag</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carpal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tarsal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st Phalanx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd Phalanx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3rd Phalanx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sesamoid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vestigial Phalanx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 6.3.4 Variation in Deer element frequencies (ratio scores) organized into utility based groups (utility designations derived from Madrigal and Holt, 2002).

<table>
<thead>
<tr>
<th>HP</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Utility (upper limbs)</td>
<td>Moderate Utility (axial, ribs, scapulae)</td>
</tr>
<tr>
<td>HP20</td>
<td>BR3</td>
<td>1 (17)</td>
</tr>
<tr>
<td></td>
<td>BR2</td>
<td>2 (9)</td>
</tr>
<tr>
<td>HP24</td>
<td>BR3</td>
<td>3 (19)</td>
</tr>
<tr>
<td></td>
<td>BR3</td>
<td>2 (13)</td>
</tr>
<tr>
<td></td>
<td>BR2</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Minimum animal units (MAU’s) computed for both BR2 and BR3 periods reveal that the fauna is dominated by moderately-ranked utility elements in both BR2 and BR3 (Table 6.3.4 and Figure 6.3.1). When cranial elements alone are taken into consideration, possibly a better indicator of local procurement of deer, BR2 sees significantly more than BR3 (Figure 6.3.2).

Table 6.3.5 Minimum Animal Utility Index (MAU) and %MAU for Housepit 20.

<table>
<thead>
<tr>
<th>HP 20:</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>MAU</td>
</tr>
<tr>
<td>Sesamoid</td>
<td>4</td>
<td>.5</td>
</tr>
<tr>
<td>Vertebral</td>
<td>8</td>
<td>.29</td>
</tr>
<tr>
<td>Ribs</td>
<td>1</td>
<td>.04</td>
</tr>
<tr>
<td>Sternum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scapula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humerus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Ulna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innominate</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Femur</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Tibia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpal/Tarsal</td>
<td>2</td>
<td>.07</td>
</tr>
<tr>
<td>Metapodial</td>
<td>11</td>
<td>2.75</td>
</tr>
<tr>
<td>Phalanx</td>
<td>6</td>
<td>.5</td>
</tr>
<tr>
<td>Fibula</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Cranial</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>
Table 6.3.6 Minimum Animal Utility Index (MAU) and %MAU for Housepit 24.

<table>
<thead>
<tr>
<th>HP 24:</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Sesamoid</td>
<td></td>
</tr>
<tr>
<td>Vertebra</td>
<td>15</td>
</tr>
<tr>
<td>Ribs</td>
<td></td>
</tr>
<tr>
<td>Sternum</td>
<td></td>
</tr>
<tr>
<td>Scapula</td>
<td></td>
</tr>
<tr>
<td>Humerus</td>
<td></td>
</tr>
<tr>
<td>Radius</td>
<td></td>
</tr>
<tr>
<td>Ulna</td>
<td>1</td>
</tr>
<tr>
<td>Innominate</td>
<td>1</td>
</tr>
<tr>
<td>Femur</td>
<td>2</td>
</tr>
<tr>
<td>Tibia</td>
<td></td>
</tr>
<tr>
<td>Carpal/Tarsal</td>
<td></td>
</tr>
<tr>
<td>Metapodial</td>
<td>4</td>
</tr>
<tr>
<td>Phalanx</td>
<td>3</td>
</tr>
<tr>
<td>Fibula</td>
<td></td>
</tr>
<tr>
<td>Cranial</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Table 6.3.7 Minimum Animal Utility Index (MAU) and %MAU for Housepit 54.

<table>
<thead>
<tr>
<th>HP 54:</th>
<th>BR2</th>
<th>BR3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>MAU</td>
</tr>
<tr>
<td>Sesamoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertebra</td>
<td>14</td>
<td>.52</td>
</tr>
<tr>
<td>Ribs</td>
<td>5</td>
<td>.21</td>
</tr>
<tr>
<td>Sternum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scapula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humerus</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Radius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulna</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Innominate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femur</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Tibia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpal/Tarsal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metapodial</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>Phalanx</td>
<td>5</td>
<td>.42</td>
</tr>
<tr>
<td>Fibula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cranial</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>
Figure 6.3.1. Deer Utility Indexes.
6.4 Emergent Inequality (Hypothesis 3):

Emergent inequality measured in terms of socioeconomic differentiation may be assessed given the conditions established above, in which there exists during BR3 an abundance of salmon and a growingly scarce yet critical resource: deer meat. As was made clear above, deer was the primary potlatch food in the ethnographic period and elite or proto-elite individuals would invest in procurement of meat by employing high-status hunters/deer stewards by payment of surplus salmon. Such status inequality would be represented archaeologically in the unequal distribution of deer parts across the site, and in the correlation of deer parts with prestige items associated with the elite.

Data show a slight correlation between the presence of deer remains and the size of the housepit during BR3 (Figure 6.4.1). Similar results are seen for BR2. This implies
that larger households may indeed have had differential access to deer meat and suggests inequality between houses based on house size.

![Deer NISP/m3 by Housepit Size](image)

*Figure 6.4.1 Deer NISP/m3 and housepit size.*

Lastly, data indicate that the distribution of deer elements between family groups residing within single multifamily pithouses varies between pithouses. In Housepit 20, distribution of deer became unequal between activity areas during BR3. Interestingly, Area 2, which has the majority of deer bones during BR3 also has the majority of prestige items.
Table 6.4.1 Spatial distribution of deer parts

<table>
<thead>
<tr>
<th></th>
<th>HP20</th>
<th></th>
<th>HP24</th>
<th></th>
<th>HP54</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1</td>
<td>A2</td>
<td>Total:</td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
</tr>
<tr>
<td>BR3</td>
<td>3</td>
<td>18</td>
<td>21</td>
<td>17</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>BR2</td>
<td>26</td>
<td>14</td>
<td>40</td>
<td>n/a</td>
<td>n/a</td>
<td>13</td>
</tr>
</tbody>
</table>

Table 6.4.2 Spatial Distribution of deer parts by volume (m³)

<table>
<thead>
<tr>
<th></th>
<th>HP20</th>
<th></th>
<th>HP24</th>
<th></th>
<th>HP54</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1</td>
<td>A2</td>
<td></td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
</tr>
<tr>
<td>BR3</td>
<td>5.36</td>
<td>47.37</td>
<td>19.77</td>
<td>8.9</td>
<td>20.3</td>
<td>14.1</td>
</tr>
<tr>
<td>BR2</td>
<td>57.8</td>
<td>48.6</td>
<td>n/a</td>
<td></td>
<td></td>
<td>30.2</td>
</tr>
</tbody>
</table>

Housepit 24 has an apparent unequal distribution of deer elements between activity areas in BR3, though not as pronounced as in Housepit 20. Housepit 54 shows no significant variation in the distribution of deer elements either in BR2 or in BR3.

The second assessment of inequality concerns correlations between the occurrence of deer NISP and prestige items. Prentiss et. al (2009) establish a generalized prestige index which was calculated for whole houses does not correlate significantly with deer NISP (Figure 6.4.2). Their prestige index included a variety of factors including prestige items, housepit size, and FCR counts (See Prentiss et. al 2009). However, when prestige items are individually singled-out and assessed by Area, there is a significant correlation with the distribution of deer NISP (Figure 6.4.3, Table 6.4.3). Area 2 in Housepit 20 and Area 3 in Housepit 24 show strong correlations between deer NISP and prestige items such as ground nephrite, copper rings, and art objects. No such correlations are evident, however, in Housepit 54.
**Figure 6.4.2** Comparison of deer parts/m3 and Prestige Item Index (Prestige Index taken from Prentiss et. al [2009]).

**Table 6.4.3** Distribution of Prestige Items (From Prentiss et. al 2009)

<table>
<thead>
<tr>
<th></th>
<th>HP20</th>
<th></th>
<th>HP24</th>
<th></th>
<th>HP54</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A1</td>
<td>A2</td>
<td>Total:</td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
</tr>
<tr>
<td>BR3</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>BR2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>BR3: A2-1 steatite pipe, 1 stone effigy</td>
<td>BR3: A1-7 beads, 1 groundstone cube, 1 groundstone ornament, 1 groundstone bowl frag; A2-1 nephrite adze; A3-1 nephrite scraper, 1 bead.</td>
<td>BR3: A1-1 copper ring; A3-1 copper bead, 1 painted stone tool, 1 spindle whorl, 1 stone bead, 1 nephrite adze frag, 1 chert scraper.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 6.4.3 Comparison of Deer NISP/m3 and Prestige Items/m3.

In order to test the significance of correlation between deer NISP and the abundance of prestige items, a Fisher’s exact test was run for the BR2 samples (SAS v.8
with “proc freq” command with “fisher” option:  \( BR\ 2\ \chi^2 = .6763; \ df=1; \ p = .4109 \).

These results suggest there is no correlation between deer and prestige items during BR2.

A Chi-Square test was run to test the significance of correlation between deer NISP and the abundance of prestige items (SAS v.8 with “proc freq” command: \( BR\ 3\ \chi^2 = 7.6297; \ df = 2; \ p = .0220 \)).  These results suggest there is a correlation between deer and prestige items during BR3.

6.5 Summary

Analyses of faunal remains from the 2008 excavations at the Bridge River village show that reliance on stored anadromous salmon remains the primary food staple at the village throughout BR2 and BR3, from 1800bp to its abandonment at 1100 BP, and indeed intensifies through time (evidenced in its abundance in relation to other food resources, low evenness scores, and inferentially in the increased size and abundance of salmon storage pits across the site).  Second, taxonomic diversity in food resources declines through time across the site, signifying a diachronic process of resource specialization.  The presence of large mammals and deer in the diet declines substantially through time.  Equal distributions of cranial and post-cranial carcass elements are present during early phases of the village, but through time shift to primarily upper and lower limb elements by late Bridge River 3 Period.  Inferences of local resource depression of secondarily-ranked resources can tentatively be drawn from this data, a plausible outcome for fragile ecosystems supporting a high-population, semi-sedentary community.  It is proposed here that by utilizing mass harvesting, processing and storage technologies
for anadromous salmon, in tandem with roots and deer, inhabitants of the Bridge River village flourished over their early history within a naturally rich and diverse environment. However, the gradual overexploitation of local secondary food resources left the community susceptible when salmon runs failed/or fluctuated likely beginning at 1100-1200 BP. Excessive processing of salmon remains documented ethnographically, which includes grinding of dried vertebrae, may have begun in late BR3 as a response to secondary resource depression.

Results of increasing variation in the spatial distribution of deer specimens across the Bridge River site suggest late-emerging socioeconomic differentiation (late Bridge River 3 Period). This is especially evident in Area 2 of Housepit 20 and Area 1 of Housepit 24. Housepit 54, the smallest of the houses, shows a continued even distribution of deer and prestige goods throughout BR2 and BR3. Further, the association of scarce deer elements in the later periods with prestige areas/prestige artifacts suggests the emergence of deer as a prestige food not before 1100 BP. The growing scarcity of deer coupled with the availability of surplus salmon may be mechanisms through which deer meat became a prestige or potlatch food, continuing into the ethnographic period.

7. Conclusion

The Regional florescence of large pithouse villages associated with a salmon-based economy throughout the Mid-Fraser was relatively short-lived. Emerging at 3500bp, all the major villages were abandoned by 800bp (Rousseau 2004). Following the collapse,
Mid-Fraser peoples dispersed and re-established more mobile settlement and subsistence patterns (Rousseau 2004). By the ethnographic period, the mobile groups had again begun to coalesce in large aggregated winter villages near salmon fishing locations, often re-occupying the older abandoned housepits of the earlier periods. The Bridge River site presents a context through which to show a specific account of culture change in this dynamic period of prehistory. The Bridge River village is one of the earliest experiments with sedentism in the Northern Plateau that was made possible by the intensification of a salmon-based economy. The data from the current study allows us a specific floor-by-floor account of culture change throughout the whole early history of the village, a span of 700 years.

The current study reveals that the earliest inhabitants of the village (or for these three pithouses anyway) lived within a rather rich environment with an abundance of terrestrial mammals available to supplement a primarily salmon-focused economy. The equal distribution of deer and large-sized mammal specimens across the site suggests an egalitarian social organization, a continuation of an ethos long established in the region during Paleoindian and Nesikep periods. This supports Prentiss et. al.s’(2005) notion of evolving socioeconomic systems, separate from hereditary inequality. Success with the new socioeconomic strategy involving salmon intensification, storage, and large aggregated winter villages, however, may have lead to the collapse of the village. Population growth was exponential within the community throughout BR3. Presence of such a large population, coupled with regional population increases limiting movement, may have lead to the depletion of local secondarily-ranked food resources including deer. As a result, these foods became scarce in the Bridge River diet during
late BR3, while salmon seems to intensify (evinced indirectly in the increasing volume of salmon storage pits). Excessive processing of salmon remains documented ethnographically, which includes grinding of dried vertebrae, may have begun in late BR3 as a response to these conditions.

This sets up a scenario in which the Bridge River community grew to be reliant on a primary food resource, anadromous salmon. Growing fluctuations in this resource due to climatic change or catastrophic landslides such as Texas Creek, would have had devastating effects on communities reliant on salmon alone. As noted by Prentiss et. al (2007), the Keatley Creek village was able to sustain itself throughout the decline in salmon by resorting to deer and other secondary terrestrial mammals for over 200 years, after the collapse of the Bridge River village.

Faunal material shows the possible development of socioeconomic differentiation late in BR3. Deer bones appear to cluster in certain areas of pithouses such as Housepit 20 and 24, and deer bones begin to co-occur with a suite of prestige items such as nephrite adzes and coastal shell beads. Ethnographic data reveals that deer meat was a prestige food and the primary food item served at potlatches (Teit 1906), and deer hunters had greater occupational prestige than those who fished (Romanoff 1992). Romanoff notes the important ecological considerations associated with the quest for deer meat, a necessary supplement to a salmon-only diet. He suggests that as Mid-Fraser economies shifted to ones dominated by salmon, the importance of deer increased as a culturally-important item. In order not to lose critical hunting knowledge, ownership of deer hunting fences, hunting territories, knowledge of local geography, and hunting magic became associated with certain families, thereby establishing and maintaining their elite...
status. Based on the economic importance of deer meat as a supplement to salmon, the maintenance of this system of emergent inequality was allowed so that this important knowledge would be continued inter-generationally (Romanoff 1992).

At the Bridge River site, the combination of gradually declining important food resource with a form of wealth (dried salmon surplus), may have been important factors in the emergence of institutionalized social inequality. Aspiring elites had a mechanism to transform wealth into prestige, buying deer meat with salmon, and in turn redistributing it in formalized feasting events such as potlatches, secondarily supporting elite families associated with deer hunting. Or, since deer seems to be associated with house size in BR3, maybe these larger households controlled access to deer hunting localities.

Culture change, then, may have been driven by a relationship between resource abundance (as per Hayden 1995), and resource depression (Ames 1994; Maschner 1999; Prentiss et. al. 2007). This would have allowed dramatic culture change late in BR3 as social mechanisms for maintaining egalitarianism loosened under both the constraints of sedentism and the freedom of surplus food. A gradual marginalization of those without access to deer emerged.
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Appendix A.

Total Volume Excavated for Housepits 20, 24 and 54 (2008).

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0.94

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1.2

HP Total: 3.24
Appendix B.

Total counts of fauna (2008).

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<td>88%</td>
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<td></td>
<td>24%</td>
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