Chapter 10

Animal Resource Utilization and Assemblage Formation Processes at Keatley Creek

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Introduction

The goals of this chapter are, first, to describe animal resource utilization and, second, to discuss faunal assemblage formation processes at the Keatley Creek site. Analysis of the faunal assemblage from the Keatley Creek site has provided extensive information concerning the subsistence strategies of the inhabitants of Keatley Creek and adds to our knowledge of subsistence practices and resource use at winter village sites in the region. Until recently, faunal studies in the southern British Columbia Interior Plateau have been limited to cursory comments which note that salmon and deer form the largest components of the assemblages (Sanger 1963, 1970; Stryd 1972; Rittenberg 1976). More recent analyses have begun to provide information concerning prehistoric subsistence practices (Stryd 1981; Lepofsky et al. 1987; Kusmer 1987, 1990) but, prior to the present work, there has been only one detailed faunal study of sites in the Lillooet region (Langemann 1987). Langemann (1987) analyzed the faunal assemblages from seven housepits at five sites near Lillooet. Although detailed provenience information was not available for these assemblages, her study yielded the first good archaeological information concerning subsistence of winter village inhabitants in the Lillooet area. The Fraser River Investigations of Corporate Group Archaeology research project at Keatley Creek provides the good provenience control and collection techniques for faunal remains lacking of earlier excavations at Lillooet and allows an opportunity to test previous and current ideas concerning Lillooet winter village subsistence practices and economic organization within villages and housepits. Faunal data from Keatley Creek were obtained from total excavation of four housepit floors, partial excavation of 19 other housepits, and excavation of 23 small cultural depressions, including cache pits. Based on these data, the utilization of animal resources at the Keatley Creek site is discussed below.

The Fraser River Investigations of Corporate Group Archaeology research project also examined taphonomic processes involved in pithouse construction, occupation, and abandonment. It was recognized that a major problem confronting Interior British Columbia archaeology is the difficulty of interpreting housepit excavations because of the extremely complex site formation processes underlying pithouse sites (Wilmeth 1977; Fladmark 1982). A taphonomic approach was also needed to evaluate the potential for obtaining a reasonably secure faunal database from housepits before the broader research goals of the project (concerning regional cultural history and socioeconomic inequalities among complex hunter/gatherers) could be addressed (Vol. II, Chap. 7). Thus, a large part of the zooarchaeological research at Keatley Creek was directed towards describing and explaining the attributes and distributions of faunal remains at the site within a taphonomic framework. Within this framework, the faunal data were used to aid in the definition of intact

living floors, to develop criteria to help distinguish floor from roof deposits, and to attempt to explain the patterning of remains within floor deposits. In addition, the presence and condition of faunal remains in all other major deposits (roof, rim, pits, potential pit or midden areas outside of housepits) were investigated. Results of this analysis are described below.

Environmental Setting

The location of the Keatley Creek site on benchlands above the Fraser River gorge allows access to a variety of animal and plant resources because of the range of biotic zones available within a short distance of the site. The vertical zonation provides close access to stream, grassland, and forest habitats. During the Kamloops occupation of the site anadromous salmon (*Oncorhynchus* sp.) were abundant in the Fraser River and the Lillooet area contained exceptional fishing spots and salmon drying conditions. The more extensive grasslands present at that time would have provided better habitat for deer and, possibly, elk than occurs today. Deer (*Odocoileus* sp.) were available on the benches in open forests and thickets near grassy meadows and bighorn sheep (*Ovis canadensis*) grazed on the grassy benches in the winter. Grasslands and parklands in the higher elevations would have offered summer grazing and browsing for deer, bighorn sheep, and elk (*Cervus elaphus*). A variety of small fur-bearers and game birds, such as snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), weasels (Mustelidae), fox (*Vulpes vulpes*), lynx (*Lynx* sp), and grouse (Tetraonidae), were available in the open forests and aquatic animals, such as beaver (*Castor canadensis*) and muskrat (*Ondatra zibethica*), and freshwater shellfish were available in some streams and ponds, particularly Seton Lake. See Alexander (1992a) for a more detailed discussion of fauna available in the various biogeoclimatic zones around the site.

Account of Taxa Present at Site EeRl 7

A summary of the taxa recovered from the Keatley Creek site follows. See Table 1 for the locations and deposits in which each taxon was found.

Freshwater shellfish remains (only *Margaritifera falcata* was identified) were found in low amounts at the site. The evidence of limited use of freshwater shellfish is similar to information available from other pithouse sites in the Lillooet Region (Langemann 1987). In this area, freshwater molluscs appear to have been utilized in small numbers throughout prehistory. Shellfish were more heavily exploited in the South Thompson area (Mohs 1981) and in the Columbia Plateau (Lyman 1980; 1984). Evidence from the Columbia Plateau suggests shellfish were largely exploited during early spring (Lyman 1984). Thus, it is possible that shellfish were collected and discarded away from winter villages in Lillooet. However, the greater abundance and quality of salmon in the Fraser River near Lillooet and superior conditions for drying salmon (Romanoff 1992a) seems to have led to less reliance on alternate dietary sources. It is likely that the few remains found at Keatley Creek are fragments of artifacts such as shell spoons and pendants (a number of valves have holes cut in them).

Eight dentalium shells (*Dentalium* sp.) were found at the site. *Dentalium* are found along much of the Pacific Coast, usually in deep water with sand or mud bottoms although they can occur in the intertidal zone (Barton 1991). Ethnographically, they were obtained on coastal British Columbia islands by picking them up where they washed up on beaches and by using special dentalium fishing rakes and spears (Barton 1991). They were highly prized and a valuable trade item.

One dogwinkle (*Nucella* sp.) shell and one purple-hinged rock scallop (*Hinnites giganteus*) artifact, possibly a bracelet, were found at the site. Dogwinkles are marine molluscs common along rocky, intertidal foreshores along southern British Columbia coasts. Rock scallops are large, marine bivalves found in low densities in intertidal, rocky areas. Dentalium, dogwinkle, and rock scallop are rarely recovered from Interior sites.

Fish (*Oncorhynchus* sp.) bones were the most common faunal remains found at Keatley Creek. Radiography was used to speciate some of the *Oncorhynchus* vertebrae and they have all been identified as species of Pacific salmon (Vol. II, Chap. 8). Thus, all the fish remains are assumed to be salmon. The distribution of species of *Oncorhynchus* present in the housepits and fish bone distribution are discussed in Volume II, Chapters 7 and 8.

Bird remains are very limited at the site. Grouse (Tetraonidae) were probably obtained for food, as most body parts have been recovered. The other bird bones probably are the remains of birds obtained for ritual or decorative purposes. Long-tailed hawk (*Accipiter* sp.) and short-tailed hawk (*Buteo* sp.) are represented by wing bones only. These are probably the remains of animals collected primarily for their feathers. One crow (*Corvus* sp.) wing bone was found. One bald eagle (*Haliaeetus leucocephalus*) mandible fragment and four common loon (*Gavia immer*) bones (3 ulnae and 1 fibula) were found in one housepit. Common loons are found in freshwater lakes and large open rivers during spring,

Table 1. The Location and Type of Deposit from Which Taxa were Recovered

The first number in each line is the number of specimens (NISP) for that taxon. Bone/antler artifacts are included. See Volume II, Chapters 7 and 10 for deer, fish, and dog locations.

Freshwater shellfish
(some identified as Margaritifera falcata)
2 - EHP 8 (cache pit, level 2)
3 - EHP 11 (occupation level)
2 - HP 1 (rim)
11 - HP 3 (floor, roof, pit)
63 - HP 7 (floor, roof, rim, pit)
18 - HP 9 (all floors, roof, pit)
2 - HP 47 (floor and refuse dump)
2 - HP 58 (floor)
2 - HP 101 (most recent floor)

Dentalium sp. (dentalium shells)
3 - HP 7 (rim, pit)
4 - HP 9 (second and last floors)
1 - HP 109 (stratum VI)

Nucella sp. (dogwinkle)
1 - HP 7 (pit)

Hinnites giganteus (purple-hinged rock scallop)
1 - HP 7 (floor)

Gavia immer (common loon)
4 - HP 9 (second floor, pit associatied with second floor)

Accipiter sp. (long-tailed hawk)
2 - HP 7 (pit)
1 - HP 3 (pit)

Buteo sp. (short-tailed hawk)
1 - HP 3 (roof)

Haliaeetus leucocephalus (bald eagle)
1 - HP 9 (basal roof)

Tetraonidae (grouse)
7 - HP 7 (floor, roof, pit)
1 - HP 101 (most recent floor)
3 - HP 105 (pit)
1 - HP 110 (most recent floor)

Corvus sp. (crow)
1 - HP 8 (pit)

Lepus americanus (snowshoe hare)
1 - EHP 7 (rim)
1 - HP 3 (pit)
26 - HP 7 (floor, roof, rim, pit)
3 - HP 9 (basal floor, second floor, pit)
1 - HP 105 (refuse dump)
4 - HP 110 (earliest floor, pit)

Tamiasciurus hudsonicus (red squirrel)
2 - HP 7 (roof)
1 - HP 3 (roof)
1 - HP 58 (roof)
2 - HP 107 (floor)
1 - HP 110 (most recent floor)

Castor canadensis (beaver)
2 - EHP 6 (buried paleosol)
4 - HP 1 (floor, rim)
6 - HP 4 (floor, pit)
8 - HP 3 (floor, roof)
1 - HP 8 (pit)
58 - HP 7 (floor, roof, rim, pit)
21 - HP 9 (all floors, roof, rim, pit)
6 - HP 12 (floor, roof)
1 - HP 47 (refuse dump)
1 - HP 101 (most recent floor)
2 - HP 105 (pit)
2 - HP 108 (floor)
14 - HP 110 (earliest floor)

Ondatra zibethica (muskrat)
1 - HP 7 (rim)
1 - HP 58 (floor)

Vulpes vulpes (red fox)
2 - HP 7 (floor, roof)

Ursus arctos (grizzly bear)
1 - HP 7 (floor)

Martes pennanti (fisher)
2 - HP 7 (roof, rim)

Lynx sp. (lynx or bobcat)
1- HP 7 (roof)

Cervus elaphus (elk)
2 - HP 7 (floor, pit)
3 - HP 9 (second floor, pit)*chck lg antler from other floors*
2 - HP 12 (floor, roof)
1 - HP 90 (roof)
1 - HP 101 (dump assoc. with 1st occupation)
1 - HP 105 (pit)

Alces alces (moose)
1 - HP 7 (rim)

Ovis canadensis (bighorn sheep)
1 - EHP 7 (storage deposits of pit)
2 - EHP 10 (infill and refuse)
3 - HP 4 (pit)
11 - HP 7 (floor, roof, rim, pit)
18 - HP 9 (second and last floors, basal roof, pit)
5 - HP 58 (roof, refuse dump, pit)
4 - HP 101 (earliest floor, pit, most recent floor)
6 - HP 105 (pit)
3 - HP 110 (earliest floor)

cf. Oreamnos americanus (mountain goat)
1 - HP 58 (refuse dump)

summer, and fall. They migrate to coastal areas in B.C. for the winter. Usually only one breeding pair inhabits a lake, although large lakes may have two or more breeding pairs (Godfrey 1976). The loon bones (primarily wing bones) are probably the remains of loons obtained for some purpose other than food, such as for ornamental uses.

Small mammal remains other than beaver (*Castor canadensis*) and snowshoe hare (*Lepus americanus*) are uncommon at the site. Beaver are represented primarily by incisors (Table 2), which were commonly used as woodworking chisels ethnographically. These tools were probably curated and may represent remains from beavers caught during the summer or fall. Few post-cranial remains were found suggesting beaver were rarely hunted for food or pelts during the winter when they would have been relatively inaccessible. The beaver inhabits slow-moving streams, usually in forested areas, and spends most of the winter beneath the ice and in lodges (Banfield 1981). Based on body part representation (Table 2), the snowshoe hare, on the other hand, appears to have been hunted (probably for both its meat and skin) during the winter and brought back to the pithouses for processing. The snowshoe hare inhabits forests and thickets and is active year-round (Banfield 1981).

Table 2. Beaver and Hare Element Distribution at EeRl 7

Skeletal Element	Beaver	Hare
Tooth fragment	68	0
Mandible	1	1
Premaxilla	0	1
Vertebra	8	0
Rib	8	0
Scapula	1	2
Humerus	1	4
Radius	0	2
Ulna	0	2
Femur	2	4
Tibia	0	5
Carpal/Tarsal	1	0
Metapodial	2	6
Phalanx	6	4

Muskrat (*Ondatra zibethica*) was found in two housepits. Muskrats are large, aquatic, rat-like animals which inhabit marshy edges of lakes and rivers. They sometimes occupy beaver-lodges (Cowan and Guiget 1975) and could be acquired along with beavers. Ethnograpically, they were trapped for their skins (Teit 1906). The remains are too few to determine why they are present in the site.

Small rodent remains, vole (*Microtus* sp.), deer mouse (*Peromyscus* sp.) and pack rat (*Neotoma* sp.), were found in some of the deposits in small numbers. These animals occur naturally in the area and their body part representations (often virtually complete skeletons of one animal) and low occurrences indicate they are the remains of animals that died naturally on the site.

Two red fox (*Vulpes vulpes*) molars, representing two individuals, were recovered. Two fisher (*Martes pennanti*) molars and one lynx (*Lynx* sp.) proximal phalanx were also found. Teit (1906) states that foxes, fishers, and lynx were trapped for their skins. The remains are too few to determine why they are present in the site.

Dog (*Canis familiaris*) remains are discussed in a separate analysis (Vol. II, Chap. 10).

A large grizzly bear (*Ursus arctos*) distal phalanx was the only bear bone found at the site. Bears are not true hibernators and would have been available to winter hunters. However, they appear to have been seldom utilized, and perhaps were used more for ritual purposes or for their skins rather than for subsistence. Ethnographically, bears were important in Lillooet mythology and some of the Lillooet clans were Bear Clans, the members of which wore black and grizzly bear skins during ceremonies (Teit 1906). The grizzly was a powerful guardian spirit for hunters and, according to Teit (1906), grizzly bears were hunted for their skins and claws. Bear prints figure prominently in the rock art of the area.

Few elk (*Cervus elaphus*) remains were found at the site. The remains are almost exclusively tool/ornamental materials (antler fragments; canines, some with perforations; a metacarpal; and a phalanx) which were probably curated, suggesting that elk were butchered elsewhere. Elk prefer open, parkland habitats and low valleys in the winter, and the Fraser Valley near Lillooet is apparently not good elk habitat (Teit 1906; Langemann 1987; Alexander 1992a, 1992b). They do not occur in the study area today. Ethnographically, elk bones and antlers provided material for tools and canine teeth were used as ornaments. The elk remains may have been trade items. Teit (1906) notes that the Lillooet obtained elk teeth and skins from the Thompson and Shuswap and elk were common in these areas in the past (Alexander 1992b).

Deer (*Odocoileus* sp.) was the most common mammal, other than dog, identified at the site. The distribution of deer remains is discussed in Volume II, Chapter 7 and in Appendix I. The species of deer occurring in the Lillooet area today is the mule deer (*Odocoileus hemionus*). White-tailed deer (*Odocoileus virginianus*) presently occur primarily in southeastern British Columbia. However, archaeological evidence from the Columbia Plateau indicates white-tailed deer were probably more common prehistorically than they are now (Livingston 1987). Based on morphological criteria, the bones of these two species can be identified only

to genus. Deer browse in forest edges, open coniferous forests, subclimax brush, and river valleys. In the Interior Plateau, they move to lower elevations and prefer south facing slopes with shelter from deep snow and cold winds in the winter (Banfield 1981). Ethnographically, in the Lillooet area they were usually hunted in the fall after the salmon runs (Romanoff 1992b).

A worked moose (*Alces alces*) antler piece was found in the rim of one housepit. This is most likely a trade item. According to biogeographical evidence moose were not present south of Prince George, British Columbia, prior to about 1920 (Cowan and Guiget 1975; Banfield 1981). Moose remains have not been found in other archaeological sites in the Lillooet region to date. Teit (1906) states that moose were never known in the habitat of the Lillooet Indians. Ethnographically, Upper Lillooet often traded with Shuswap Indians and Teit (1906) notes moose skins were occasionally given to the Lillooet by the Shuswap.

Bighorn sheep (*Ovis canadensis*) remains were found in small amounts in seven housepits and two exterior cache pits. Sheep remains are found in the earliest to the latest occupations but are much less common than deer remains in all contexts. The majority of identified remains are horn fragments, phalanges, and teeth. The body part representation is similiar to that of deer in most areas of the site and reflects survivability and ease of identification of the elements, making assessments of butchering practices difficult. Since no evidence for on-site butchery was found for sheep, although there was for deer, the element representation may indicate that sheep butchering took place off the site and that primarily bones attached to skins or needed for tools were brought back to the site. Bighorn sheep are grazers and usually move seasonally between summer alpine meadows and grassy winter valleys close to rugged cliffs. On winter ranges they may be found in close proximity to deer (Banfield 1981).

One possible mountain goat (*Oreamnos americanus*) phalanx was found. Goats inhabit rugged mountainous areas with deeper winter snow than bighorn sheep (Banfield 1981). They occur some distance from Keatley Creek in the higher mountains to the west but were hunted ethnographically for both their meat and skins (Teit 1906).

Animal Resource Utilization At Keatley Creek

As has been noted at other Late Prehistoric sites in the Interior Plateau, the faunal assemblage indicates that the subsistence of winter village inhabitants at Keatley Creek was predominantly based on dried salmon and deer, along with specific plants as discussed in the preceding chapter. Salmon and deer remains (most unidentifiable artiodactyl and large mammal bones are assumed to be deer) form by far the greatest part of the faunal assemblage at the site. The importance of the salmon fishery in the Lillooet area is exemplified by the preponderance of salmonid bones in the Keatley Creek faunal assemblage. A number of other taxa were found in the site but, based on the paucity of their remains, animal resources other than salmon and deer were of limited importance during the winter occupations of the site (Table 1). Bighorn sheep, beaver, snowshoe hare, red squirrel, and grouse were apparently utilized in small amounts. The small animals could have been obtained opportunistically during deer hunting or plant gathering expeditions and bighorn sheep would have been available in the winter near deer habitats. Some of these taxa were probably obtained primarily for their meat, while others, such as the beaver, also yielded pelts and materials for tools and rituals (these materials were probably curated).

The fish remains found on housepit floors are most likely remains from fish that were uncooked since bones of fish boiled or stewed for any length of time are highly susceptable to destruction (Wheeler and Jones 1989; Lubinski 1996). Thus, the remains are probably from fish that had been air-dried or smoked (and which are often not cooked before eating) and stored for winter and early spring consumption. The fish bones found in the bottoms of the pits within housepits are primarily articulated backbones, with few cranial remains. Although today most fillets are dried without bones, ethnographically salmon fillets were air-dried or smoked either with or without backbones attached, depending on the species and fat content of the fish (which varies with species and part of the run), and were stored in both underground and above-ground caches (Kennedy and Bouchard 1992; Romanoff 1992a). Historically, the best of the coho, those which were not too fatty, and sockeye were often smoked, or especially air-dried, with the backbone attached (Kennedy and Bouchard 1992; Romanoff 1992a). Teit (1900) notes that salmon caught late in the fall were dried without removing the backbone. The Lillooet also dried backbones separately. These "neckties" were used for making soup in the winter (Romanoff 1992a; Kennedy and Bouchard 1992) and also had considerable meat attached (Hayden, personal communication). The fattest, tastiest salmon seem to have been stored in above-ground caches near the river and consumed first, while underground caches were reserved for later consumption and contained the leaner fish caught later in the year (Kennedy and Bouchard 1975). The species of salmon present in the interior pits at Keatley Creek (primarily pink and possibly sockeye or spring)

supports the idea that the underground interior pits at Keatley Creek contained fish from a fall fishery (Vol. II, Chap. 8). Archaeological data from the eastern Interior Plateau indicate that salmon from late fall runs were used for long-term underground storage in that area also (Kusmer 1990), probably due to lower fat content and lesser chance of spoilage (Romanoff 1992a). Fatter fish taste better but do not preserve as well as lean fish. Therefore, both kinds would have been desired to make it through the winter.

The subsistence pattern seen at Keatley Creek (intensive exploitation of deer and stored salmon with limited opportunistic exploitation of other varied resources) is also supported by Langemann's data (1987) and by stable-carbon isotope analyses which indicate that a marine source (salmon) contributed 70% of the protein in prehistoric diets in this area (Chisholm 1986; Chishom et al. 1982; Lovell et al. 1986). Ethnographic accounts (Teit 1906) imply that a greater variety and abundance of animals (greater diversity) were used during terminal prehistoric and early historic times. This apparent change in subsistence strategy parallels a change in settlement pattern discussed by Hayden and Ryder (1991).

Unusually large and complex winter villages, such as the Keatley Creek site, developed in the Lillooet region during the last 3,000 years and were abandoned about 1000 years ago. Hayden and Ryder (1991) believe that this collapse was caused by a catastrophic landslide that dammed the Fraser River, blocking salmon runs. The heavy reliance on salmon and deer documented in the assemblage from Keatley Creek supports this hypothesis. Salmon stores were apparently so abundant during occupation of the site that few animals other than deer were needed to supplement them. The river upstream from Lillooet is ideal for procuring high quality salmon and conditions in the area are better than most for drying and preservation. If a slide reduced access to salmon, a greater range and number of animals would be needed to take the place of salmon, since no one other animal is as abundant and accessible. This could explain the greater diversity of animals noted in the ethnographic record. It is also likely that smaller animals such as beaver were easier to obtain during seasons other than winter and that most of their bones may have been left at seasonal hunting camps.

Bone Distribution at the Site

Animal procurement, butchery, consumption, and disposal practices at Keatley Creek have been examined both through the analysis of several housepits and through the analysis of faunal remains from other areas of the site. Areas where refuse was disposed of, exterior hearths and cooking pits, exterior storage pits, and a butchering area have been identified. These data allow us to make some preliminary assessments concerning utilization of animals during winter occupation of the village pithouse site.

Mammal bones are found in relatively low amounts at the site compared to fish bones (see Vol. II, Chap. 7 for discussions of fish bone distribution at the site). This probably reflects primarily the importance of the salmon fishery and relatively low artiodactyl carrying capacity in the Lillooet area (Alexander 1992a, 1992b), although some off-site disposal of artiodactyl bones cannot be ruled out. Ethnographically, a large portion of the meat stored for winter use was stored without bones (Teit 1906). Dried deer meat was also a potlatch item (Romanoff 1992b). Bones of some animals, particularly deer and beaver, were sometimes thrown into the water so that dogs would not gnaw on them and offend the animals (Teit 1906). Ray (1942:128–129) lists cultural practices among the Lillooet which would result in deer bones not being found in housepits: meat may be given away en route (on the hunt), may be deposited outdoors, cooked meat may be taken out (of the pithouse), meat may be divided evenly between hunters, deer bones may be buried or thrown in the water, and dogs may get some of the bones. It is likely that most bones of animals hunted during the winter more than a few kilometers away were not always brought back to the pithouse and Ray's (1942) trait list of ethnographic bone disposal and meat dispersal supports this. Although these types of practices may have had an effect on large mammal bone distribution prehistorically as well, it is difficult, if not impossible to test for these in the archaeological record. Also, the bone element distribution in most areas of the site reflects the ability of the bones to survive destructive processes obscuring butchering information (Vol. II, Chap. 7). The only thing that is certain is that some proportion of the animals that were hunted in the winter were brought back to winter villages with bones and that these were generally extensively broken up presumably for the extraction of lipids. Langemann (1987) also found that bones from Lillooet sites were exceptionally heavily fragmented. This may explain why few bones have traces of dog consumption since bones boiled for marrow appear to be unappealing to carnivores (Yellen 1991). Environmental evidence presented by Alexander (1992a, 1992b) suggests that absolute abundance of deer was never great in the area (ranging from about 25 to 600, depending on the severity of the winter) and that 2 to 42 deer could be taken by hunters (mostly in Alpine areas) per year on a sustained basis. Winter deer kills by residents of any one pithouse may have been on the order of 1 to 2 per winter at the most. This is probably the most important

reason why mammal bones are relatively rare compared to salmon at the site.

Test excavations indicate that areas around the pithouses were sometimes used as hearths or roasting pits to cook deer and salmon, and may also have been used as refuse dumps (Appendix I). Ethnographic studies (e.g., Teit 1906) and archaeological work at other sites in the Canadian Plateau suggest that small, circular or oval pit features are often associated with housepits. The small amount of evidence we have to date suggests these pits were primarily used for food storage and earth ovens (Teit 1906; Lepofsky et al. 1987; Richards and Rousseau 1987; Kusmer 1987) and this is supported by the excavations at Keatley Creek.

At least four of the excavations near housepits revealed cache pits (EHPE 7, 8, 9, and 10) (Appendix I). These features appear to have been originally used for storage and then to contain refuse or dirt from the immediate vicinity. In general, the recovered faunal remains appear to be refuse material. The bones are comparable in size to bones from interior pits, being larger than bones from floor and roof deposits but still relatively heavily fragmented, and many of them are burned. These characteristics, the amount of identifiable deer and artiodactyl bones, and element representation is consistent with the idea that the bones are refuse from butchering activities conducted elsewhere (Appendix I). The presence of salmon bones with the artiodactyl remains also suggests the pits were filled with garbage from butchering and food preparation activities that occurred elsewhere.

The exterior cache pits differ from interior pits with respect to the distribution of salmon bones. Large interior pits are sometimes found to contain a large amount of salmon at the bottom of the pits. These remains probably represent stored salmon left at the bottom of the pits. None of the sampled exterior pits contain large amounts of salmon near their bottoms. (EHPE 10 contained a few salmon bones at the bottom but these are associated with charcoal and may have been dumped in from a hearth.) The exterior pits were either not used to store salmon, or all the salmon in these features was utilized. At this point we do not understand why there are external and internal storage pits or what differences between external versus internal storage mean. Perhaps salmon stores from exterior pits were utilized first, and as winter progressed, interior pits were used. Thus, salmon at the bottom of the interior pits may have had more time to spoil. The salmon species identified from the interior pits indicates the fish were caught during the fall (Vol. II, Chap. 8). These are generally the less desirable, less fatty fish, which may have been stored for consumption during the last phase of winter and early spring when the stores in the exterior pits were depleted. On the other hand, exterior pits near the pithouses may have been used to store food other than fish such as dried deer meat or berries. Ethnographically, three kinds of caches were used to store food (Teit 1906). Both underground cache pits and elevated box caches were apparently constructed near where resources were obtained and ethnographically, riverside caches were used first in the winter (Kennedy and Bouchard 1978). Salmon storage pits have been found near the town of Lillooet on a terrace about 28 m above present day river

Table 3. Deer (Odocoileus sp.) Remains Recovered from HP 58, Stratum V

Square A
1 left mandible, teeth not fully erupted
1 left mandible, mature
1 right maxilla, teeth not fully erupted
1 left maxilla, mature
1 left distal metacarpal, epiphyses fused
2 left distal humeri, epiphyses fused
1 right proximal humerus, unfused
1 left tibia, epiphsyses fused
1 left proximal metacarpal, epiphysis fused
1 distal metapodial, epiphysis unfused
1 right distal tibia, epiphysis unfused
1 left distal femur, epiphysis unfused
5 incisors
11 skull fragments
10 vertebral fragments
7 rib fragments
3 costal cartilage fragments
1 distal phalanx, epiphysis fused
5 sesamoids
1 second phalanx, epiphses unfused
Square B
1 left distal humerus, epiphysis fused
1 left distal radius, epiphysis fused
1 left distal tibia, epiphysis fused
1 left tibia, epiphyses unfused
1 right radius, epiphyses unfused
1 right proximal tibia, epiphysis fused
1 left scapula (in 5 fragments), fused
1 right fibular tarsal
1 left fibular tarsal
3 phalanges, epiphyses fused
2 sesamoids
12 vertebrae, 6 with unfused epiphyses
10 rib fragments
5 pelvic fragments
NISP = 101 MNI = 4[1]

1. Based on 3 mature left distal humeri (= 3 mature individuals) plus 1 immature individual which would not have had a fused distal humerus.

level (Lepofsky et al. 1987). Underground caches near pithouses were also used for storing food for the winter (Teit 1906; Romanoff 1992a). Fish and meat were often stored in the elevated caches, while the underground caches near pithouses were used for roots and berries (Kennedy and Bouchard 1978). Whether the same pattern of use characterized the Keatley Creek storage practices remains to be demonstrated.

Relatively large amounts of faunal remains were recovered from deposits overlaying occupation floors in three of the small housepits which were test excavated (Appendix I). The assemblages from two of the housepits (47 and 105) have been interpreted to be refuse dumps (Appendix I) and this suggests that sometimes vacated pithouses and/or pithouse depressions were used as garbage dumps by inhabitants of other pithouses. The lack of such remains in the large housepits excavated to date (other than in interior pits) suggests these structures were utilized late in time, perhaps up until the time of site abandonment. The assemblage from the third housepit, HP 58, is different from other assemblages found at the site (Table 3; Appendix I) and attributes of the assemblage suggest the pithouse/depression was used at least once for primary butchery of artiodactyls after the pithouse was abandoned. Little further butchering for marrow extraction or grease production seems to have occurred here although all other mammal bones recovered from Keatley Creek indicate bones were heavily fragmented for marrow and grease extraction.

Housepit Deposit Formation Processes

This section describes the faunal assemblages present within housepit deposits at Keatley Creek and examines and attempts to distinguish processes involved in their formation. The aims of this part of the faunal study were as follows:

1) To identify and attempt to explain the differences and similarities of animal remains between floor and roof deposits tentatively identified through geological techniques. Criteria to be investigated were bone fragment size, frequency, condition, breakage, and taxa represented. It was hoped that this analysis would serve as a supplementary line of evidence and aid in the interpretation of the different deposits.
2) To examine the frequency and distribution of different size fractions of bone in the living floor deposits. Along with a similar study of lithic debitage, this analysis would provide information concerning the degree of contamination of the floor deposits. Evidence from ethnoarchaeological studies (Hayden 1982; Hayden and Cannon 1983) suggests that refuse collects along the walls and little used areas of a structure, that central areas are clear with small debris around hearths, and that the largest refuse is located along the walls. The presence of this type of patterning would indicate relatively uncontaminated floors, while a random distribution of debris would suggest contamination of the floor deposits.
3) If intact living floors were satisfactorily identified, a third aim was to identify activity, storage, and disposal areas and gain some insight into animal utilization and disposal practices within a pithouse. Roof deposits would be similarly examined for patterning that might be expected from disposal of waste on the roof or butchering activities conducted at the base of the roof. This would be accomplished by examining the frequencies and distributions of various size categories of remains, taxa represented, and butchery and breakage patterns.

   This third aim is discussed in Volume II, Chapter 7.

Methods

A large housepit (HP 7) and a medium-sized housepit (HP 3) were chosen for detailed analyses of underlying taphonomic processes responsible for housepit formation, and in particular to examine differences between major types of housepit deposits (floor, roof, and rim).

All faunal remains recovered from HP 7 and HP 3 were examined. The following information was recorded for each bone fragment recovered from the 6.35 mm mesh: element, portion of element, taxon, type of break, weathering state, surface modification (e.g., burning, cutmarks, gnaw marks), and maximum dimension. For the faunal remains from the flotation samples, taxa represented and the frequency of bones (all in the 0.15–1.00 cm size range) were recorded.

Faunal Assemblage Formation

Most of the faunal remains recovered from HP 7 and HP 3 can be placed in two categories: small fragments of unidentifiable mammal bones or fish bones. The data indicate that the frequencies of these bone types vary with the type of deposit and that attributes of the mammal bones also vary with deposit type (Table 4). The following discussion attempts to explain the processes responsible for this faunal assemblage formation.

Mammal bones from all deposits in HP 7 and HP 3 are generally small fragments, unidentifiable to skeletal element, although bones from the rim and interior pits

in HP 7 tend to be slightly larger. This indicates natural and/or cultural processes were extensively reducing bones at Keatley Creek. Artiodactyl bones are highly fragmented at the site suggesting extensive bone breakage for marrow and grease production. The frequency of artiodactyl skeletal parts is correlated with the density of the individual skeletal parts. The most common skeletal parts are those that survive well because they have the densest bone (and also are easily identifiable as small fragments) (Table 5). This indicates the patterns of artiodactyl skeletal parts observed has more to do with the ability of individual bones to survive fragmentation processes rather than being a reflection of primary butchering patterns (Lyman 1991; 1992). The frequency distributions of artiodactyl remains as a whole (not distinguished by element) may, however, suggest processing and/or consumption areas within the pithouses (Vol. II, Chap. 7).

In addition to human fragmentation for grease procurement, post-depositional weathering and carnivores can cause extensive bone fragmentation, leaving only the most durable elements. Surface condition of the bones suggests weathering is not a major problem, especially for bones from floor and pit deposits (Table 4). Dog remains are relatively common in the assemblage suggesting dogs may have fragmented some of the bones. However, there is little direct evidence for this. Carnivore damage is rare on bones from any deposit. The most frequent break type occuring on bone fragments is the spiral fracture. Spiral fractures may be produced by a number of processes, including both carnivore chewing and human bone reduction activities. However, most of the long bone fragments appear to have originated from mid-shaft breaks, rather than breaks occuring at the bone ends which are usually associated with carnivore damage (Lyman 1987). Dog coprolites have been recovered from the site and frequently contain salmon bones. There is no indication of canid gastric etching and few gnaw marks on bones. The extensiveness of artiodactyl bone fragmentation in all deposits, the abundance of small, mammal bone fragments in all types of deposits, the lack of carnivore damage or gnawing on bones, and the presence of salmon bones in dog coprolites, suggests most bones were reduced during bone processing for marrow and grease. This is not unexpected in a site occupied during the winter when sources of meat may have been limited. Dogs may have primarily been fed poorer quality salmon (salmon is ethnographically of lower status than deer [Romanoff 1992b]) and have had little access to artiodactyl bones. In any case, whether human or natural processes were fragmenting the artiodactyl bones, the result is the same: transport and butchering information has been greatly diminished.

Table 4. Condition of Faunal Remains Recovered from Deposits in HP 7 and HP 3, Keatley Creek

	HP 7		HP 3	
	#	%	#	%
Floor				
Total bones	2401	—	561	—
Fish bones	1344	.56	314	.56
Non-fish bones	1057	.44	247	.44
Burned bones[1]	349	.33	124	.50
Weathered bones[2]	28	.04	0	0.00
0–2 cm	797	.75	160	.65
2.1–8 cm	254	.24	86	.35
>8 cm	6	.01	1	<.01
Roof				
Total bones	3,046	—	293	—
Fish bones	319	.10	14	.05
Non-fish bones	2,727	.90	279	.95
Burned bones	1,595	.59	143	.51
Weathered bones	339	.30	27	.20
0–2 cm	1,917	.70	189	.68
2.1–8 cm	787	.29	89	.32
>8 cm	23	.01	1	<.01
Rim				
Total bones	636	—		
Fish bones	177	.28		
Non-fish bones	459	.72		
Burned bones	123	.27		
Weathered bones	168	.50		
0–2 cm	206	.45		
2.1–8 cm	248	.54		
>8 cm	5	.01		
Filtered Collapse				
Total bones			153	—
Fish bones			2	.01
Non-fish bones			151	.99
Burned bones			105	.70
Weathered bones			12	.08
0–2 cm			102	.68
2.1–8 cm			44	.29
>8 cm			5	.03
Roof/Rim				
Total bones	312	—		
Fish bones	70	.22		
Non-fish bones	242	.78		
Burned bones	46	.19		
Weathered bones	42	.21		
0–2 cm	148	.61		
2.1–8 cm	94	.39		
Medium/Large Pits				
Total bones	4,955	—		
Fish bones	3,161	.64		
Canid bones	1,265	.25		
Other bones[3]	529	.11		
Burned bones	61	.11		
Weathered bones	38	.07		
0–2 cm	268	.51		
2.1–8 cm	252	.48		
>8 cm	9	.01		

1. The number and percent of non-fish bones that are burned.
2. The number and percent of non-fish and unburned bones that are weathered.
3. The numbers and percentages of burned, weathered, and sizes of bones in pits pertains only to these non-fish, non-canid bones.

Floor assemblage formation: Data from HP 3 and HP 7 indicate two major differences between bones from floor and roof deposits (Table 4). First, fish remains are found primarily in floor deposits (and in interior pits). Few fish bones are found in roof deposits. This indicates that there has been little intermixing of roof and floor deposits. This pattern is also strongly developed in the HP 9 assemblage (Table 6 and Appendix II), excavated after the detailed analysis of HPs 3 and 7 was completed. Secondly, few bones from the floor, pits, or filtered collapse are weathered, while 20–30% of the roof bones and 50% of the rim bones are weathered. Bone fragment size is similar in floor and roof deposits. The differences in fish bone frequency and weathering frequency appear to be good distinguishing characterisics of floor versus roof bone assemblages, and can be used to help distinguish the two types of deposits. The paucity of weathered bones in floor deposits, along with the small relative amount of mammal bones (compared to that in roof deposits) and the small size of the bones, suggests the floors are largely uncontaminated with roof bones and that the fish bones and highly fragmented mammal bones on the floor are the product of cultural activities that took place within the housepit. Non-random distributions of bones on the floors also corroborate this assessment (Vol. II, Chap. 7). The floors were kept clean of large debris. Bone preservation in floor deposits is good and therefore apparently had little influence in creating spatial patterning of bones observed in floor deposits, although housecleaning activities (especially of larger bones) and trampling likely affected some distributions (Vol. II, Chap. 7).

Roof assemblage formation: The presence of relatively large frequencies of mammal remains in roof deposits as compared to floor deposits can be due to a number of factors such as butchering activities on or near roofs, bone artifact manufacture, and refuse dumping. The bones are generally small fragments (Table 4), similar in size to floor deposit bones indicating extensive bone reduction processes occurred. The greater exposure to subaerial weathering of roof bones could have caused some bone breakage. However, many of the small fragments appear to be in good condition and are not broken in a way typical of weathering-related breakage. Rim bones have a higher frequency of weathering, yet they are larger than roof bones, suggesting factors in addition to weathering probably fragmented the roof bones. Analyses of the patterning of bones from roof deposits (Vol. II, Chap. 7) suggests the large amounts of small fragments of mammal bones on the roofs are probably the result of butchering and bone reduction activities (occurring either on the roof or inside with subsequent discard on the roof), in addition to some weathering-related breakage (and loss).

Due to the presumed longer existence of roof deposits than floor deposits plus the possible continuous discard of bone material on the roof throughout the use-life of the house, we might expect many times more faunal remains in roof than in floor deposits. This is clearly not the case, suggesting either considerable attrition of faunal remains in roof deposits (which we have no evidence for) or that the dirt roofs were used for relatively short periods of time and were periodically replaced.

The similarity in the frequency of burned mammal bones from floor and roof deposits in HP 3 suggests that there was a similar processing origin for mammal bones in both (Table 4). Possibly burned and unburned refuse bone on floors were periodically gathered up

Table 5. Distribution of Artiodactyl Elements

	HP 7			HP 3		HP 12	
Skeletal Element	**Floor**	**Roof**	**Pits**	**Floor**	**Roof**	**Floor**	**Roof**
Tooth fragment	10	32	5	1	8	0	0
Skull	0	6	0	0	0	0	0
Mandible	4	0	0	0	0	0	0
Vertebra	0	9	2	1	0	0	0
Rib	1	4	1	0	2	0	0
Sternum	2	0	3	1	0	0	0
Scapula	2	8	5	1	0	0	0
Humerus	4	2	0	1	0	0	0
Radius	0	3	0	1	0	0	0
Ulna	0	2	1	0	0	0	0
Pelvis	0	2	1	0	0	0	0
Femur	1	0	0	0	0	0	0
Tibia	0	2	0	0	0	0	0
Carpal/Tarsal	12	14	8	3	1	0	1
Metapodial	11	29	5	3	4	5	9
Phalanx	21	35	13	2	2	0	6
Total[1]	68	148	44	14	17	5	16

1. Does not include antler fragments.

and discarded on the roof. The relatively small number of burned fish bones in floor and roof deposits suggests that many of the bones were not burned during burning of the structure, perhaps because they were insulated by the soil. In HP 7, the higher frequency of burned roof bones is due to concentrations of burned bones in post-occupational hearths and hunting camps in the center area of the housepit depression. Areas of refuse dumping and possibly butchering activities relating to the housepit occupation are found around the periphery of the roof in HP 7, as in HP 3 (Vol. II, Chap. 7).

Filtered collapse assemblage formation: These deposits were observed in HP 3. Bones from filtered collapse deposits are the same size as other roof bones, but are more burned and less weathered (Table 4). Fish bones are rare, as in roof deposits. This is to be expected of bones from bottom roof deposits that first filtered down onto the floor as the structure burned. The lower incidence of weathered bones than in standard roof deposits may be due to the position of filtered collapse at the base of roof sediments which would have protected the bones from subaerial weathering.

Roof/Rim (Stratum V) assemblage formation: In HP 7, the relatively larger bones from roof-like deposits in the upper rim in the east (Stratum V) have characteristics similar to mammal bones from interior storage/refuse pits (Table 4), suggesting either that garbage bones were dumped on the roof in this area or that butchering activities occurred here. This deposit consists of collapsed roof material, not typical rim deposits. This is because a hill slope forms the rim on the east side. These roof deposits are different from deposits elsewhere on the roof because of their location on the house rim and because the extreme slope sometimes caused slumpage. The bones in this deposit occur at a higher frequency than other rim deposits, and are less burned, less weathered, and larger than bones from typical roof deposits. Possibly the natural hill slope abutting the roof here created favorable conditions for butchering or other activities. No similar occurrences were found in the east or other roof sections of housepits that did not abutt hillsides.

Medium and large interior pit assemblage formation: Interior pits in HP 3 and HP 7 are major repositories of faunal remains. The presence of large quantities of articulated salmon remains in the bottoms of some of the pits suggests the primary function of the pits was to store salmon (see Appendix III). In HP 7, mammal bones from these features are similar in size to rim bones, being larger than floor or roof bones (Table 4). These bones are less weathered than roof or rim bones (similar to floor bones) and less burned than floor, roof, or rim bones. The relatively large size and unburned and unweathered condition of mammal bones and bone artifacts from the pits in HP 7 indicate that after the pits were emptied of stored fish, the pits were filled in with debris from the floor, including unwanted bone tools and larger bones. Thus, the bones in the pits are probably collections of bones, especially larger bones, from animal processing actvities that occurred on the floors. The artiodactyl bones in the pits have a similar element distribution to bones from the floor and roof deposits, suggesting that most bone refuse was put in the pits after secondary butchering and consumption activities. The pits could have been used as garbage receptacles during occupation once the salmon was depleted, and the bones may be the remains either from tossing in individual bones during meals and/or from housecleaning (Bartram et al. 1991). Alternatively, unused salmon storage pits may have been filled in with larger debris, left on the floor at the time of seasonal abandonment, during fall cleanup prior to reoccupation. The relative frequency of fish in the pits, above the bottom layers of fish bones, is similar to the frequency of fish on the floor (about 60%). Also, bone refitting in one of the pits indicates the pit was filled in fairly rapidly, supporting the second scenario, although different pits may have different depositional histories.

Two of the large pits in HP 7 also contained domesticated dog skeletons at the bottom of the pits, indicating some sort of special treatment of dog remains (see Vol. II, Chap. 10). The faunal remains in the fill above the dogs are similar to those in the other pits. The large pits in HP 3 were also apparently used to store salmon, but the fill above the salmon bones contained few mammal remains compared to the pits in HP 7. There are fewer medium/large pits in HP 3, suggesting they were all needed for salmon storage, and actively being used for this purpose, rather than some being filled with garbage during occupation of the house. According to field notes, one pit was apparently partially filled in with hearth cleanings during the last occupation.

Rim assemblage formation: Rim deposits were excavated primarily in HP 7. The highly localized concentrations of relatively large, unburned, and weathered bones in rim deposits in HP 7 (Table 4) could be primary refuse from butchering activities, secondary refuse from activities that took place in the house, or both. The remains mostly concentrate in the north, with another concentration in the east. The percentage of identifiable artiodactyl remains in rim deposits is similar to that in floor and roof deposits and they are primarily axial and lower leg and foot parts, although more fragments of large mammal limb bones were found than in the floor or roof deposits. Thus, all parts of the artiodactyl skeleton occur on the rim, and the long bones were apparently smashed for marrow extraction (although not necessarily on the rim). It is difficult to tell from the attributes of the bones whether they are primary or secondary refuse, or both. Ethno-

archaeological research highlights this problem, but suggests that occupational length and proportion of secondary to primary refuse are related (Bartram et al. 1991). The permanence of the pithouse structures and evidence of repeated seasonal reoccupation of many of the structures leads one to expect that many of the bones at the site have been moved from their original contexts through various activities such as trampling, scuffing, and housecleaning. The location of the bones in the rim, around the periphery of the living area, suggests they are the result of dumps of debris from housecleaning; perhaps from cleaning out interior pits and/or from housecleaning of large debris left on the floor during seasonal abandonment. Dumps of fire-cracked rock also concentrate in the north indicating that area was used as a garbage dump (Vol. I, Chap. 14).

The presence of all parts of the artiodactyl skeleton, including axial parts such as mandibles, in localized areas of the rim supports the idea that they are garbage dumps. Axial parts, including mandibles, are also found on the floor in contexts that suggest consumption areas, indicating these parts of the skeleton were utilized and not left at butchering sites. Ethnoarchaeological research also suggests that axial parts and phalanges in primary contexts (on the floors in this case) indicate post-butchering consumption areas (Bartram et al. 1991). Their presence in rim deposits points to post-consumption cleaning and dumping of floor deposits on the rims.

Summary

The winter village inhabitants at Keatley Creek during the Kamloops phase appear to have been relying primarily on stores of food acquired during hunting, gathering, and fishing expeditions at other times of the year. Their animal subsistence strategy during the winter involved concentrating heavily on dried salmon (and perhaps dried artiodactyl meat), with limited opportunistic hunting of deer and bighorn sheep, and little exploitation of smaller animals. Useful parts of other animals hunted during earlier seasons were also introduced into the housepits as curated tools or decorations (e.g., beaver teeth, bird wings, bear paws, tooth pendants, pelts). Still other elements were introduced as trade items (e.g., moose and elk antler, marine shells). The pattern of resource use revealed at Keatley Creek substantiates previous research suggesting that the combination of availability of vast quantities of a predictable resource (salmon), storage and processing technology, and optimal drying conditions had a major influence on the development of the Late Prehistoric subsistence strategy and growth of large pithouse villages in the Lillooet Region.

It appears food was stored for winter in both interior and exterior underground cache pits. Dried salmon seems to have been stored primarily in the interior pits, and the exterior pits may have been used for other dried foods and/or for salmon consumed earliest in the season. The few artiodactyls procured during the winter were extensively butchered for marrow procurement and grease production suggesting that they were a highly valued supplement to the dried foods. Some primary butchering may have occurred on inhabited pithouse roofs and in nearby abandoned pithouses, while secondary butchering and preparation for cooking may have occurred both on roofs and in the pithouses (Vol. II, Chap. 7). Debris from butchering and consumption activities was dumped into unused interior and exterior pits, onto roofs and rims, and in uninhabited pithouse depressions.

Analysis of bones from within housepits indicate that intact living floors were present and that faunal remains from floor and roof deposits differ in two major attributes; the degree of bone weathering and the frequency of fish remains. These attributes can be used in conjunction with other types of information to identify floor and roof deposits.

Floors were kept clear of large faunal debris. The differential occurrence of fish bone in floor deposits plus the non-random distributions of fish, identified mammal, and unidentified mammal bones (Vol. II, Chap. 7) indicate that activity/living areas on the floor have been preserved with little post-occupational disturbance. The small size of fragmented mammal bones, and low frequency relative to the roof, indicate that most large debris was swept or picked up and dumped elsewhere. Some larger bones and discarded artifacts appear to have been dumped in large interior pits after they were emptied of salmon and in localized rim areas. Pits emptied of salmon were apparently filled in with debris fairly rapidly, perhaps at the beginning or end of yearly reoccupations. Some smaller bone refuse appears to have been cleaned up and dumped on the roofs. The lack of fish bones in roof deposits suggests these tiny bones were difficult to remove from the floors and/or did not survive in the roof soil environment after periodic roof replacement involving removal of floor sediments. Clusters of larger bones in roof/rim deposits in HP 7 suggests larger debris from food production/consumption was dumped in specific areas or that animals were butchered there, which field observations indicate did occur at hunters' camps made in the housepit depressions long after the abandonment of the pithouses and the collapse of their roofs. There is evidence for extreme bone reduction for marrow procurement and grease production along with some weathering fragmentation. Little carnivore/dog damage is

apparent. It is not possible to obtain much information concerning butchering practices because artiodactyl bones have been so fragmented and the remaining elements reflect survivablity and identifiablity rather than, or in addition to, butchering patterns.

Garbage bones from butchering, food preparation, and/or consumption appear to have been dumped in localized areas of the rim in HP 7. This may have occurred primarily at the beginning of yearly reoccupations when floors were cleaned up and swept. Smashing of long bones for marrow extraction may have occurred on the rim also, especially in the north. It is difficult to tell from the attributes of the bones in roof and rim deposits whether they are primary or secondary refuse, or both. However, the permanence of the pithouse structures and evidence of repeated seasonal reoccupation of many of the structures leads one to expect that many of the bones at the site have been moved from their original contexts.

Appendix I:
List of Faunal Remains from Areas Outside of Housepits and from Tested Housepits

Interpretations of feature and stratum identity/function are based on excavation reports in Volume III.

Extra Housepit Excavation (EHPE) 1, a roasting pit north of HP 7, contained the following bone fragments: 2 deer (*Odocoileus* sp.), 3 artiodactyl, 97 unidentifiable mammal, and 1 salmon. Twenty-four percent of the bone fragments were burned.

EHPE 2, a hearth north of HP 7, contained the following bone fragments: 1 *Canis* sp., 1 artiodactyl, 27 mammal, and 11 salmon. One mammal fragment was burned.

EHPE 4, a small circular cultural depression, may have been used as a storage pit and/or earth oven. However, the function of this area is not clear. Sixteen unidentifiable mammal frament (9 burned), 2 deer fragments, 4 large mammal fragments, and 5 salmon bones were recovered from this pit.

Eight areas between housepit depressions with apparent potential for cultural remains were excavated in 1988. The faunal remains from these areas are listed below.

EHPE 5 (HP 119): Extra-housepit excavation 5 took place in a roundish, flat area in the southwestern portion of the site. Excavations in the area in 1987, conducted to determine if cultural activity had created the feature, revealed cultural sediments under about a meter of naturally deposited sediments. These sediments were found in 1988 to be a buried Kamloops housepit (HP 119) covered initially by fluvial and then by aeolian deposits. Faunal remains were recovered from the following sediments: Five deer tarsal bones, 1 deer ulna fragment, 2 artiodactyl bones, 1 canid radius, and 54 unidentifiably mammal bones were recovered from Zone I. This zone is composed of recently deposited aeolian sediments and the faunal remains probably represent fairly recent bones left on the contemporary surface. One deer thoracic vertebra fragment, 1 deer pelvis fragment, 1 artiodactyl fragment, and 11 unidentifiable mammal fragments were recovered from Zone II. Zone II is composed of water-lain deposits which infilled the housepit. The bone fragments are small and probably washed in with the sediments. One deer pelvis fragment was recovered from Zone III, Stratum III. This stratum appears to be the roof deposits of the buried housepit.

EHPE 6: Extra-housepit excavation 6 consists of a 2×0.5 m unit dug into a small, mound-like feature about 35 m southeast of HP 1. A buried paleosol exists ca. 70–80 cm BS. Faunal remains were recovered from this stratum only and consist of 1 deer tarsal, 1 beaver (*Castor canadensis*) tooth, 1 beaver phalanx (burned), and 23 weathered large mammal fragments (all less than 3 cm in maximum dimension).

EHPE 7: Extra-housepit excavation 7 was dug into a small, oval, cultural depression located in the southeastern rim of HP 4. Three 1×0.75 m units, forming a N/S trench through the cultural depression were excavated in 10 cm arbitrary levels. The depression is thought to be a small cache pit dug into the rim spoil deposits of HP 4 and HP 73. It was apparently used during the Plateau horizon, which concurs with the main occupation of HP 4. The pit was apparently used as a refuse dump after its original use as a storage facility.

Seventeen salmon and 207 mammal bones were recovered from this depression. The bones were found in the following deposits: One slightly charred bighorn sheep (*Ovis canadensis*) tooth fragment, 1 left deer radius, 1 right deer radius, 1 right deer ulna, and 19 unidentifiable mammal fragments were recovered from

deposits near the bottom of the pit. These deposits may represent the original storage function of the pit. One deer phalanx, 2 burned artiodactyl long bone fragments and 32 unidentifiable mammal fragments were recovered from infill deposits probably representing refuse dumping in the pit. One artiodactyl fragment, 1 deer molar, 1 immature deer metapodial, 2 salmon vertebrae, and 54 unidentifiable mammal fragments were recovered from Stratum XIII. This stratum appears to be rim spoil deposits from HP 4 to the north and/or HP 73 to the south. Fifteen salmon bones, 1 hare (*Lepus* sp.) femur, 1 deer metapodial, 1 deer pelvis, 1 deer talus, and 88 unidentifiable mammal fragments were recovered from Stratum XIX. This stratum is part of a large pit feature excavated into a paleosol and may be part of a buried housepit. The deposits are typical of heavily disturbed rim spoil.

EHPE 8: Extra-housepit excavation 8 was dug into a small, circular depression on the edge of a terrace bordering the western edge of the site. Three 1 × 0.75 m units, forming a N-S trench through the depression, were excavated in 10 cm arbitrary levels. The feature is thought to be a shallow cache pit, probably used only once. Fourteen large mammal fragments were recovered from the pit at 10–30cm BS. One fragment was burned, 13 fragments were 2–3 cm and one was 3–4 cm in maximum dimension. These remains probably represent debris from natural or cultural infilling of the pit.

EHPE 9: Extra-housepit excavation 9 was conducted in a small, circular, cultural depression on the southern edge of the site about 5 m southeast of HP 9. Two 1 × 0.75 m conjoining units were excavated. The depression is thought to have functioned originally as a cache pit. It appears to have been intentionally filled in with rim deposits from HP 9 after use as a storage facility during the late Kamloops horizon. Sixty-five bones were recovered from the pit, all from Stratum IIa and Stratum IIb. These strata appear to represent cultural infilling events. One deer phalanx, one deer tibia, 2 artiodactyl metapodials, and 56 unidentifiable mammal bones were recovered from 10–20 cm BS; and 5 mammal bones were recovered from 20–30 cm BS. About 25% of the bone are >2cm. Five of the bones are weathered and 40 are burned.

EHPE 10: Extra-housepit excavation 10 was conducted in a small, oval, cultural depression located on the first terrace overlooking the main part of the site. Three 1 × 0.75 m units, forming a trench through the feature, were excavated. The depression is thought to have originally been used as a storage facility and then used as a refuse pit. Salmon and mammal bones were found throughout Stratum III from 50–90 cm BS. This stratum appears to be composed of infill and refuse deposits. Eighty-seven salmon bones were recovered, 5 associated with charcoal at the bottom of the pit, 1 from 45–50 cm BS, and the rest from 60–90 cm BS. One *Canis* sp. metapodial was recovered from 72–76 cm BS. Eight intrusive vole (*Microtus* sp.) and 2 intrusive deer mouse (*Peromyscus* sp.) bones were found. Two bighorn sheep cervical vertebrae, 2 deer scapulae (1 highly weathered), 1 deer metacarpal, 3 deer tarsals, 1 deer phalanx, 1 deer humerus, 1 artiodactyl metatarsal, 3 artiodactyl ribs, and 7 unidentifiable mammal fragments were recovered from these deposits. Most of the large mammal bones were recovered from 73–80 cm BS. About 80% of the mammal bones are >3 cm in maximum dimension and about 50% are >8 cm.

EHPE 11: Extra-housepit excavation 11 was conducted in a small, circular, cultural depression immediately southwest of HP 26. Three 1 × 0.75 m units, forming a trench through the feature, were dug in 10 cm arbitrary levels. The feature is thought to represent a small dwelling, although it may also have been a storage pit. Faunal remains were recovered from the following strata: One mammal and 39 salmon bones were recovered from Stratum IIb. This stratum appears to represent natural infilling and cultural discard of items during the Kamloops horizon. Three salmon, 3 mammal, 3 freshwater shell fragments, and an artiodactyl metapodial wedge were recovered from Stratum IV. This stratum appears to relate to the occupation (or storage) function of the feature. Three salmon bones, 1 mammal bone, and 1 deer ulna exhibiting carnivore damage were found in Stratum VI. This stratum appears to consist of slopewash deposits. Eleven salmon bones, 12 mammal bones, and 1 artiodactyl metapodial were found in Stratum VII. This stratum also consists of slopewash deposits. Seventy-two salmon bones, 12 mammal bones, and 1 artiodactyl tooth fragment were recovered from Stratum VIII. This stratum represents the initial construction and use of the feature and appears to be the floor deposits of a small dwelling.

EHPE 12: Extra-housepit excavation 12 was conducted in a small, circular, cultural depression west of HP 105 on Terrace II. Three 1 × 0.75 m units, forming a trench intersecting the depression, were excavated in 10 cm arbitrary levels. Two individual episodes of hearth construction and use during the early Plateau horizon are evident in the deposits. These deposits contain a high frequency of small, burned, mammal bone fragments. The feature also appear to have been used as a refuse pit for lithic debris.

Faunal remains were found in the following strata: One salmon bone; 2 teeth, 4 phalanges, 2 metapodials, and 1 carpal from artiodactyl; and 199 unidentifiable mammal fragments (95% burned) were recovered from Stratum II. This stratum appears to be a mixture of

natural and cultural fill associated with early Plateau use of the feature. One burned deer phalanx and 8 burned mammal fragments were recovered from Stratum III, an early Plateau hearth. One burned artiodactyl sesamoid and 26 burned mammal fragments were recovered from Strata IV and V, another Plateau hearth predating Stratum III. Six burned mammal fragments were recovered from Stratum VII. The origination of this stratum is not clear.

EHPE 15: One salmon vertebra and 1 burned mammal bone were recovered.

EHPE 18: Two artiodactyl long bones were recovered from Square A, Subsquare 3, Stratum I. Twenty-eight mammal bones, 2 salmon vertebrae, 2 salmon postcranial bones, 1 deer right first phalanx, and 1 deer left humerus fragment were found in Square A, Subsquare 7, Stratum III. Sixty-five mammal bones, 1 salmon cranial bone, 7 salmon vertebrae, 1 deer third phalanx, 1 artiodactyl metapodial fragment, 4 artiodactyl phalange fragments, and 1 artiodactyl tooth fragment were recovered from Square A, Subsquare 11, Stratum III. Two partial vole (*Microtis* sp.) skeletons were also recovered from Subsquare 11. The vole bones included 3 skull fragments, 4 mandibles, 4 femora, 1 ulna, 2 tibiae, 4 scapulae, and 1 radius.

Only 8 of the recovered bones are burned and none are weathered. Eighteen percent of the bones are over 3 cm in length and 20% are under 2 cm in length.

EHPE 19: In Stratum II, 122 mammal bones (1 burned), 14 salmon vertebrae, 36 salmon cranial bones (MNI=2), 17 fish rays and spines, 1 Canis phalange fragment, 10 artiodactyl long bone fragments, 5 deer humerus fragments, and 7 fetal/newborn artiodactyl long bone fragments were recovered.

In Stratum III, 7 mammal bones, 1 salmon vertebra, and 10 unidentifiable fish bones were recovered.

Only 1 of the recovered bones is burned and none are weathered. Forty-eight percent are less than 2 cm in length and 35% are greater than 3 cm in length.

Housepit 1

HP 1 is located on the western edge of the main site and averages 20 m in diameter. Test trench and unit excavations recovered Kamloops and Shuswap points. Fifteen fish bones, 76 mammal bones, 2 artiodactyl bones, and 1 deer phalange were recovered from roof deposits. Twelve fish and 58 mammal bones, 2 beaver incisors, and 1 deer scapula fragment were recovered from floor deposits. Fourteen fish, 62 mammal, and 2 artiodactyl bones; 1 ulna, 1 metapodial, and 1 phalange of deer; 2 shell fragments; and 2 beaver incisors were recovered from rim deposits. Seventy-five burned mammal bones were recovered from a hearth in Square B. About 650 fish bones; 33 mammal bones; and 3 phalanges, 1 carpal, 1 tarsal, and 1 metapodial of deer were found in pit feature #1. Six mammal bones were found in pit feature #2.

Housepit 2

HP 2 averages 18.5 m in diameter and is located in the central area of the site. Test trench excavations recovered Plataeu, Shuswap, and Kamloops points. One deer humerus and 35 burned mammal bones were recovered from roof deposits. One deer metapodial and 112 burned mammal bones were recovered from floor deposits. Ten mammal and 70 fish bones were recovered from rim deposits.

Housepit 4

HP 4 is located in the southwest main area of the site and averages 10.25 m in diameter. Test trench excavations recovered Plateau, Shuswap, and Kamloops points. Four fish and 24 mammal bones were recovered from roof deposits. Twenty-five fish and 34 mammal bones; 1 incisor, 1 humerus, and 1 radius of beaver; and 1 metapodial, 2 tarsals, and 1 tibia of deer were recovered from floor deposits. Four fish and 2 mammal bones were recovered from rim deposits. Eight fish and 30 mammal bones; 2 phalanges and 1 incisor of beaver; 1 deer phalange; and 3 bighorn sheep horn core fragments were recovered from pit feature #2.

Housepit 5

HP 5 averages 20 m in diameter. Test trench excavations recovered Kamloops, Shuswap, Plateau, and earlier points. One fish and 79 small, calcined mammal bones were found in rim deposits in Square F. Five fish and 15 mammal bones were found in a feature in Square A. One mammal bone was recovered from roof fill in Square B. Twenty-three fish and 4 mammal bones were found in a feature in Square C.

Housepit 8

HP 8 averages 17.5 m in diameter. Test trench excavations recovered only Plateau points. Five fish and 5 mammal bones were recovered from rim deposits. Eleven fish and 1 mammal bones, and 1 beaver incisor were recovered from a feature in Square BB. One fish and 25 burned mammal bones, and 1 crow carpometacarpus were recovered from a feature in Square AA. Thirteen mammal fragments were found in a feature in Square B.

Housepit 47

HP 47 is a cultural depression averaging 8.0 m in diameter. It is located on the southern edge of the site about 20 m east of HP 5. Test excavations revealed a complex stratigraphy which seems to be related to a series of cultural events that occurred at this feature. Initially a hearth appears to have been built and utilized, perhaps in the Late Shuswap—Early Plateau time period. A housepit was constructed some time later. After abandonment of the housepit, the depression was apparently used as a refuse dump during Late Plateau to Early Kamloops times, perhaps by nearby HP 5 inhabitants. A hearth, and possibly a small structure, were apparently built in the depression after its use as a refuse receptor. Faunal remains were recovered from the following deposits.

Stratum IV: One burned mammal fragment and 84 salmon bones were recovered from Stratum IV, the possible hearth feature built into the refuse dump.

Stratum VI: One salmon vertebra was recovered from Stratum VI, which is probably a refuse dump.

Stratum VII: One freshwater shell fragment, 159 salmon bones, 1 deer scapula, 3 deer phalanges, 1 deer tarsal, 1 intrusive vole (*Microtus* sp.) skull fragment, 1 beaver (*Castor canadensis*) tooth fragment, and 31 unidentifiable mammal fragments were recovered from Stratum VII, which was probably built up through a series of dumping events. The mammal bones are unburned, 40% are >2 cm and about 30% are >3 cm. These attributes are consistent with remains from either a refuse dump or butchering area, but element representation, associated faunal remains, and other contextual information indicate that the refuse explanation is more probable. A small (4 mm), calcined bone bead was also recovered from Stratum VII.

Stratum VIII: Fifty-four salmon bones, 1 deer metatarsal, 1 artiodactyl long bone fragment, and 1 unidentifiable mammal bone were recovered from Stratum VIII. This stratum is thought to consist of refuse deposits also, and may be combined with Stratum VII.

Stratum IX: One freshwater shell fragment, 37 salmon bones, 1 deer tarsal bone, and 14 unidentifiable mammal fragments were recovered from Stratum IX. The bones are unburned and about 75% are <2 cm. A wedge-shaped antler artifact and about 25 burned, broken fragments of a large mammal bone (probably a scapula) were also recovered. Some of the fragments show signs of cultural modification in the form of striations and ground edges. Stratum IX appears to consist of floor deposits from the housepit occupation.

Stratum XI: Fourteen salmon bones were recovered from Stratum XI. This stratum appears to represent the initial hearth deposits.

Housepit 58

HP 58, a small housepit, is located at the southwest edge of the main site area at the base of a terrace slope. Test excavations revealed a single occupation. After abandonment the depression was apparently used as a deer butchering area. Faunal remains were recovered from the following deposits.

Stratum II: This appears to be roof fill. Eleven salmon bones, 2 deer, 1 red squirrel (*Tamiasciurus hudsonicus*), and 81 unidentifiable mammal fragments were recovered. Four fragments of incised, flat mammal bone were also recovered.

Stratum IV: This appears to represent burned, bark covered roof deposits. It is overlain by Stratum II. Eight salmon, 4 deer, 1 bighorn sheep, 1 artiodactyl, and 110 unidentifiable mammal bones were recovered. Ninety-eight percent of the bones are burned. About 40% of the bones are >2 cm and about 15% are >3 cm.

Stratum V: This stratum contains one of the largest concentrations of bones recovered at Keatley Creek to date. Eighty-four salmon, 48 deer, 1 bighorn sheep, 1 possible mountain goat (*Oreamnos americanus*), 50 artiodactyl, and 463 unidentifiable mammal bones were recovered. The deer bones consist of the remains of at least 4 individuals and fragments from the entire skeleton are present (Table 3). (Ribs, vertebrae, sesamoids, and costal cartilage are identified as artiodactyl.) This element representation is different from what was found in other areas of the site (Table 5) and suggests this may have been a dumping area associated with a primary butchery location. This is further supported by the bone attributes: less than 5% of the bones are burned, about 30% are >3 cm, and about 10% are >8 cm.

Stratum VII: These deposits are difficult to interpret, but may be floor deposits which aggraded over time. Eleven salmon, 1 muskrat (*Ondatra zibethica*), and 16 unidentifiable mammal bones were recovered. Fifty percent of the mammal bones are burned and most are <2 cm.

Stratum III: This consists of rim deposits formed during construction of the initial housepit. Thirteen unidentifiable mammal bones were recovered. Two of the bones are burned and 9 are weathered. About 40% are >2 cm.

A pit feature partially exposed in the west wall of Square B contained 7 salmon bones, 3 immature bighorn sheep tarsals, 2 artiodactyl bones and 22

unidentifiable mammal bones. Thirty percent of the bones are >3 cm.

Although only a small amount of roof, floor, and rim deposits were excavated at HP 58, they appear to contain faunal remains with characteristics similar to remains from the same deposit types in housepits 3, 7, and 12.

Housepit 90

HP 90 is a small housepit located on the northwest periphery of the main area of the site. Most of the housepit was excavated and it was found to contain deposits from a single, late Plateau horizon, occupation. Faunal remains were recovered from the following deposits.

Stratum III: Five deer, 2 artiodactyl, 1 artiodactyl skull fragment, 4 large mammal, and 3 unidentifiable mammal bones were recovered from this stratum. This stratum represents post-occupational infilling.

Hearth feature 1: Seventy-nine burned mammal bones were found in this hearth associated with Stratum III. This appears to be the remains of an early historic temporary encampment.

Hearth feature 2: Thirty-six burned mammal bones were recovered in this hearth also associated with Stratum III. This appears to be a late prehistoric hunting campsite.

Stratum II: Two salmon and 5 mammal bones were recoverd from Stratum II, the floor deposits.

Pit feature 1: One deer ulna and 6 unidentifiable mammal bones were recovered from this pit feature associated with Stratum II.

Stratum V: Three salmon, 1 artiodactyl antler, 1 elk (*Cervus canadensis*) antler, 1 unidentifiable bird, and 14 unidentifiable mammal bones were recovered from Stratum V, which represents roof deposits.

Housepit 101

HP 101 is a small housepit located on the western edge of the main site area at the base of a terrace slope. Test excavations revealed at least three occupations. The initial occupation may have been during the Plateau horizon. The second occupation appears to have been brief and its age is uncertain. The final occupation occurred during the Kamloops horizon and its deposits were excavated in some detail. Faunal remains were recovered from the following deposits.

Stratum III: Ten salmon, 1 deer, 10 large mammal, and 17 unidentifiable mammal bones were recovered from Stratum III. This stratum appears to represent mixed roof and rim deposits from the southern edge of the house.

Stratum IV: Ten salmon, 2 large mammal, and 21 burned, unidentifiable mammal bones were recovered from Stratum IV. This stratum appears to represent roof deposits at the southern edge of the house from the most recent, Kamloops horizon, occupation.

Stratum V: Thirteen salmon, 2 deer, 8 large mammal, and 49 unidentifiable mammal bones were recovered from this stratum. This stratum also represents roof deposits associated with the Kamloops horizon occupation.

Stratum VI: Four hundred and eighty-three salmon bones (many partially articulated), 2 freshwater shell fragments, 1 grouse (Tetraonidae) bone, 1 beaver tooth, 4 deer bones, 2 bighorn sheep bones, 4 artiodactyl, 54 large mammal, and 46 unidentifiable mammal bones were recovered from this stratum. One of the shell valves has a perforation in it. Two deer antler artifacts were also found. Stratum VI represents floor deposits from the most recent Kamloops horizon occupation.

Stratum VII: Twenty-eight salmon and 2 large mammal bones were recovered from Stratum VII. This stratum may be a floor deposit lying directly underneath Stratum VI.

Feature 2: Fourteen salmon bones, 1 deer phalanx, 1 artiodactyl phalanx, and 3 unidentifiable mammal bones were recovered from this pit feature associated with Stratum VII.

Stratum IX: Eight salmon, 1 bighorn sheep phalanx, 1 large mammal, and 1 unidentifiable mammal bone were recovered from this stratum. Stratum IX represents floor deposits from the initial occupation of the house.

Feature 3: One artiodactyl metapodial and 1 burned, unidentifiable mammal bone were recovered from this pit feature associated with Stratum IX. A bighorn sheep horn core wedge was also found in this feature.

Feature 4: One burned deer phalanx, 1 burned elk canine, and 3 unidentifiable mammal bones were recovered from this possible hearth or refuse dump area associated with Stratum IX. An oval-shaped large mammal bone with a perforation in one end (probably a pendant) was also found here.

Stratum X: Eight salmon, 2 large mammal, and 9 unidentifiable mammal bones were recovered from this stratum. Stratum X represents rim deposits associated with the uppermost occupation of the house.

Housepit 104

Test excavation at this small housepit revealed a complex stratigraphy, difficult to interpret with available data. The deposits may represent dense collapsed house deposits overlying an ashy deposit with a high concentration of calcined bones. It is not possible to determine at this time if the ashy deposit is associated with the housepit occupation or was dumped in the house later. Faunal remains were recovered from the following deposits in the test trench.

Stratum I: Forty-seven unidentifiable mammal fragments wre recovered. About 96% of the bones are burned.

Stratum II: Three, unburned, unidentifiable mammal bones were recovered. This stratum may be associated with Feature I (Stratum III).

Stratum III: Forty salmon, 4 artiodactyl, and 196 unidentifiable mammal bones were recovered. About 97% are burned and over 90% are <3 cm. This stratum (Feature I) is a large circular accumulation of charcoal, ash, and calcined bones underlying Stratum I.

Stratum V: Two salmon, 4 artiodactyl, and 8 unidentifiable mammal bones were recovered. Four of the bones are burned and all are >3 cm.

Stratum VI: Five, unburned, unidentifiable mammal bones were recovered.

Stratum VII and Stratum IX: One deer tarsal, 1 artiodactyl phalanx, and 51 unidentifiable mammal bones were recovered. About 92% are burned and 94% are <3 cm. All the unburned bones are weathered. These strata may represent roof collapse deposits.

Stratum VIII: Seventeen salmon bones, 1 deer phalanx, 1 deer metatarsal, 1 artiodactyl phalanx, and 23 unidentifiable mammal bones were recovered. All of the bones are burned and 80% are <3 cm. Strata V, VI, and VIII may represent poorly understood cut and fill events.

The following remains were recovered during more extensive excavations of HP 104 in 1994–1996.

Square A. Five burned mammal bones were recovered from the surface. Nineteen mammal bones (15 burned) were recovered from the roof surface (Stratum II).

Stratum VII (roof): Six salmon vertebrae, 71 mammal bone fragments, 1 artiodactyl phalanx, 1 artiodactyl vertebra, 1 deer molar fragment, 3 deer phalanges, 2 deer astralagi, and 1 deer calcaneus were recovered from roof deposits. Ninety percent of the bones are burned and the unburned bones are weathered. Fifty-four percent of the bones are under 2 cm in length and 12% are over 3 cm in length. This area of the roof contains a higher percentage of burned bones, and smaller bones, than squares C, D, and F.

Stratum VIII (floor): Thirty-seven salmon vertebrae, 63 indeterminate fish bones, 1 hawk carpometacarpus fragment, 19 red squirrel (*Tamiasciurus hudsonicus*) bones (MNI=1), 124 mammal bone fragments, 20 mammal vertebrae fragments, 3 artiodactyl long bone fragments, 2 artiodactyl scapula fragments, 2 artiodactyla metacarpal fragments, 2 artiodactyl vertebrae fragments, 4 artiodactyl rib fragments, 1 artiodactyl metapodial, 1 artodactyl sesamoid, 1 deer mandible fragment, 1 deer femur, 1 deer humerus, 9 deer first phalanges, 3 deer second phalanges, 4 deer third phalanges, 1 deer carpal, 4 fragments of a burned deer metacarpal, 1 deer sesamoid, and 5 deer rib fragments were recovered from floor deposits. About 50% of the bones are burned (including most of the deer and artiodactyl bones) and 1 (<1%) is weathered. Thirty-one percent of the bones are <2 cm in length and 38% are >3 cm in length. This area of the floor contains more burned bones and the bones are slightly larger than the mammal bones found in Squares C, D, and F.

Two dog coprolites were found in floor deposits. Tiny fragments of mammal and fish bones were found in the coprolites.

The deer mandible, including incisors and molars, is a right mandible from a young deer, based on the unworn condition of the teeth. Some of the deer bones were found concentrated in one area. These are 5 rib fragments; 2 third phalanges; 1 second phalanx; 1 first phalanx; and articulated right first (unfused proximal epiphysis), second, and third phalanges.

Squares C, D, and F. *Stratum VII* (roof): Sixteen salmon bones, 212 mammal bone fragments, 2 vole mandibles, 9 artiodactyl fragments (2 metapodials, 1 phalange, 4 vertebrae, and 2 teeth fragments), 16 deer fragments (2 mandibles, 7 incisors, 2 metapodials, 3 phalanges, 1 astragalus and 1 sesamoid) were found in roof deposits. The 2 deer mandibles and 7 incisors are from the same individual. Twenty-two percent of the roof bones are burned and 6% are weathered. One mammal bone fragment shows evidence of carnivore chewing. About 30% of the bones are under 2 cm in length.

Stratum VIII (floor): One hundred and eleven salmon bones, 2 bird long bone fragments, 1 bird ulna fragment, 122 mammal bone fragments, 15 artodactyl fragments (1 long bone, 3 vertebrae, 1 metapodial, 10 phalanges), 6 deer phalanges, 1 hare (*Lepus americanus*) humerus, and 1 medium mammal femur were found in floor deposits.

In a dump on the floor, 2 salmon vertebrae, 18 mammal bones, 1 artiodactyl long bone, 1 artiodactyl rib, 1 deer left mandible, and 1 deer third phalanx were found.

About 25% of the floor bones are burned and about 70% of the bones are under 2 cm in length. The largest bones are found along the wall in the floor dump.

Square G. *Stratum VII* (roof): Two salmon vertebrae, 27 mammal bones, 1 artiodactyl metapodial fragment, 3 artiodactyl teeth fragments, 1 deer calcaneus, and 4 deer molars were found in roof deposits. Seventy-six percent of the roof bones are burned. Thirteen percent are under 2 cm in length and 24% are over 3 cm in length.

Stratum VIII (floor): Five salmon vertebrae, 2 salmon cranial bones, 22 indeterminate fish bones, 29 mammal bones, 6 deer first phalanges, 4 deer second phalanges, 3 deer third phalanges, 8 artiodactyl phalange fragments, 5 deer rib fragments, 7 deer sesamoids, 6 artiodactyl long bone fragments, and 3 artiodactyl sternum fragments were found in floor deposits. In a dump on the floor, 3 fish bones, 75 mammal bone fragments and the following artiodactyl and deer bone fragments were found: artiodactyl—2 long bone fragments, 2 vertebrae fragments, 2 metapodial fragments, 2 rib fragments; deer—6 teeth fragments, 2 rib fragments, 1 metapodial fragment, 1 skull fragment, 1 sesamoid, and 1 third phalanx.

Five percent of the floor bones are burned. One mammal bone shows evidence of carnivore chewing. Fourteen percent are under 2 cm in length and 56% are over 3 cm in length. The largest bones are found in the dump.

Feature 1: an ashy area in Square D. Two artiodactyl phalange fragments and 188 unidentifiable mammal fragments were recovered. All of the bones are burned and about 70% are less than 1 cm in length.

Stratum IIIA: organic loam associated with Feature 1. Two artiodactyl metapodial fragments and 73 unidentifiable mammal fragments were recovered. All of the bones are burned and 68% are less than 1 cm in length.

Feature 2: pit fill. One burned deer phalanx, 1 artiodacyl tooth fragment, 5 burned mammal bones, and 182 fish bones were recovered.

Feature 3: pit fill. One salmon vertebra, 59 mammal bones (4 burned), 1 artiodactyl long bone fragment, and 2 artiodactyl femur fragments were recovered.

Discussion

Housepit 104 appears to contain a much higher density of bones than most of the other housepits excavated at Keatley Creek. Although not all of the housepit has been excavated yet, and the bones have not been plotted across the floor or roof, some preliminary comparisons with other housepits can be made.

Floor and roof deposits differ with respect to the frequency of fish bones in the assemblages, with floor deposits having a higher frequency of fish. This bears out the results of the formation process study, in which floor deposits at the Keatley Creek site are hypothesized as being distinguishable from roof deposits on the basis of fish bone frequency.

Bones on the floor of HP 104 are particularly dense when compared to other housepits. The densities of bones per subsquare are higher by a factor of 10, than those in HPs 3 and 7. The density of bones in HP 104 appears similar to that in HP 58, Stratum V, which is apparently a dump associated with primary butchery of deer.

The identified bones in Housepit 104 are also primarily artiodactyl/deer. Based on number and state of fusion of phalanges, a minimum of 2 deer individuals occur in the floor dump; a fully mature adult and an immature individual. Bones from all parts of the artiodactyl/deer skeleton are found on the housepit floor.

In two areas of floor of HP 104, (Squares A and G), bones are larger than those generally found in excavated housepits at Keatley Creek. Only 14–31% of the floor bones are under 2 cm in length and 38–56% are over 3 cm, with the largest bones occurring in the dump on the floor. In contrast, 75% and 65% of the floor bones from HPs 7 and 3, respectively, are under 2 cm in length. The bones from these areas of HP 104 are more similar in size to those in Housepit 58, Stratum V, where 30% are over 3 cm and 10% are over 8 cm. On the other hand, Squares C, D, and F contain a large number of small bones (about 70%).

Although it may appear that a high frequency of artiodactyl lower leg and foot bones occur in HP 104, their number is not unusually high when compared to the frequency of such bones in other excavated areas of the site. About 60% of the artiodactyl/deer bones from HP 104 are lower leg/foot bones (metapodials, carpals, tarsals, and phalanges). This is similar to the percentages found in HPs 7 and 3. In HP 7, 64% of the artiodactyl/deer bones from floor deposits are foot bones and 53% from the roof are foot bones. In HP 3, 57% of the floor bones and 41% of the roof bones are foot bones. Bone reduction at the site is high, and these elements are found in relatively high frequencies because they survive destructive forces well, are relatively easy to identify as small fragments, and because of the relatively high number of foot bones found in one skeleton.

In summary, HP 104 contains an unusually high density of animal remains (mostly artiodactyl/deer) when compared to other housepits at Keatley Creek. These remains apparently occur over much of the floor and are also generally larger in size than we usually see at Keatley Creek. A concentration of large fragments of artiodactyl/deer bones near one of the main house

posts may be a refuse discard area. Future mapping of the bones across the floor may help elucidate the processes and activities responsible for the distribution and attributes of the faunal remains in the housepit.

Housepit 105

HP 105 is a small housepit located on Terrace II near HP 104. Test excavations indicate the depression was used as a pithouse during the Kamloops horizon. A large number of artiodactyl and articulated fish bones were recovered from floor deposits. These remains were probably not deposited during occupation of the pithouse, or were deposited just prior to abandonment. Evidence from other housepits indicates floors were kept clear of large debris during occupation. Also, the condition of the remains, and the fact that fish and deer foot bones were articulated, precludes trampling after deposition. Thus, the remains may reflect use of the structure as a refuse dump after use as a habitation. Faunal remains were recovered from the following deposits.

Stratum II: One hundred and fifteen salmon, 7 deer, 1 artiodactyl, 3 vole (*Microtus* sp.), 1 *Canis* sp., and 117 unidentifiable mammal bones were recovered. About 40% are burned and 3% are weathered. About 75% are <3 cm. This stratum appears to be collapsed roof deposits.

Stratum III: This stratum represents floor deposits with a large number of bones lying horizontally on the surface. Three hundred and eighty salmon bones, many forming articulated skeletons, an articulated right rear deer ankle (consisting of 5 tarsals and 1 metatarsal), another right deer ankle (2 articulated tarsals), 1 left deer tarsal (burned), 1 left deer metatarsal, 1 hare premaxilla, and 73 unidentifiable mammal bones were recovered. Most of the bones are unburned (<50% of the unidentifiable mammal bones are burned) and none show signs of weathering. The deer bones and 10% of the unidentifiable bones are >3 cm.

Strata IV–VI: Bones recovered from levels 4–8 (15–40 cm BS) are lumped together for analysis because an unfused proximal epiphysis of a deer ulna recovered at 15–20 cm BS was found to fit on a right ulna recovered at 35–40 cm BS. The ulna has been culturally modified to form an awl at its distal end. Along with the ulna, 1 right deer radius, 4 deer phalanges, 2 deer metapodials, 7 artiodactyl bones, 524 salmon bones, and 253 unidentifiable mammal bones were recovered. These strata appear to represent deposits used to fill in a pit (Feature 1) to floor level. A fire-reddened area within these strata at 35–50 cm BS contained 2 salmon, 5 artiodactyl, and 167 unidentifiable mammal bones. All of these bones are calcined and about 98% are < 3 cm.

Feature 1: The strata from which bones were recovered from this large pit feature in Square A are difficult to discern from information on the level bags. Thus, I will list the remains recovered by level. Three bighorn sheep phalanges and 4 mammal bones were recovered from 50–60 cm BS (Strata VII and VIII?). One sheep phalanx and 8 mammal bones were recovered from 60–80 cm BS (Stratum VIII?). One bighorn sheep phalanx, 1 bighorn sheep astragalus, 1 artiodactyl astragalus, and 13 mammal bones were recovered from 80 cm BS to the pit bottom (Stata IX and X?).

In Square C, 92 salmon bones, 2 deer phalanges, 2 artiodactyl long bones, and 62 mammal bones were recovered from the first 20 cm of the pit. Forty-six salmon bones, 5 artiodactyl vertebrae (immature), 2 small bird humeri, and 71 mammal bones were recovered from 45–59 cm BS. Ten salmon bones, 1 right deer ulna, radius, and humerus; 1 *Canis* sp. phalanx, 1 beaver tooth fragment and 58 mammal bones were recovered from Stratum VI. One deer phalanx and 2 mammal bones were recovered from Stratum VIII. One large artiodactyl (probably elk) metacarpal (weathered), 1 grouse (Tetraonidae) scapula and coracoid, and 8 mammal bones were recovered from Stratum IX. One grouse humerus, 1 beaver tooth, and 3 mammal bones were recovered from Stratum X.

The deposits filling the pit feature appear to have been intact during the last occupation of the pithouse. Strata IV and V appear to represent infilling of the upper levels of the pit to floor level. These deposits contain refuse from consumption and/or butchering activities and are mostly deer and salmon remains. Strata VII to X appear to represent earlier pit filling events and Strata IX and X may be remnants of the earliest storage function of the pit.

Seventy-two flat, rectangular bone objects with a single hole drilled near their centers, were recovered from the pit near the bottom of Stratum X. The objects range in size from about $1 \times 0.9 \times 0.2$ cm to about $2 \times 1.5 \times 0.2$ cm. They were found mostly lying cortex-side up, suggesting they were some type of clothing ornament (Vol. III, Chap. 10).

A thin, round, polished bone needle was recoverd from Stratum VI in Square B. A sharp needle, flat on one side, and a small bone bead were recovered from Stratum V in Square C.

Housepit 107

HP 107 is a small housepit located on the south side of Keatley Creek about 15 m east of HP 9. Test excavations indicate the housepit was occupied for a single, relatively short period of time during the Plateau horizon (ca. 2,400 to 1,200 BP). The following faunal remains were recovered during test excavations.

Stratum II: One deer phalanx was recovered from these deposits which represent predominantly roof fill.

Stratum III: Twenty-five salmon bones, 2 red squirrel (*Tamiasciurus hudsonicus*) bones, and 3 unidentifiable mammal bones were recovered from this stratum, representing the floor deposits.

Housepit 108

HP 108 is a small housepit located on the south side of Keatley Creek on the uppermost terrace about 50 m southwest of HP 9. Test excavations revealed a single, short-term occupation. No temporally diagnostic artifacts were found. Faunal remains were recovered from the following stratum.

Stratum III: Fifteen salmon bones, 2 beaver incisor fragments, and 4 unidentifiable mammal bones were recovered from this stratum, which represents floor deposits.

Housepit 109

HP 109 is located in the northeast corner of Keatley Creek on a terrace above the main area of the site. It is slightly larger than the other small housepits tested and test excavations revealed complex stratigraphy. There appears to have been a late, or possibly Plateau, mat lodge occupation above an anomalous large pit feature. Faunal remains were found in the following deposits. Provenience information on the faunal bags was inadequate for this housepit and it was not possible to assign all the bones to strata.

Stratum II: Six salmon bones, 1 deer ulna, 1 artiodactyl long bone, and 9 unidentifiable mammal bones were recovered from this stratum, which represents roof deposits.

Stratum III: Sixty-nine salmon bones, 10 unidentifiable mammal bones, and 33 *Canis* sp. vertebrae fragments and 1 sacrum were recovered from this stratum. The sacrum and 4 lumbar vertebrae were apparently found articulated and covered with a birch bark/fir needle bundle. This stratum represents floor deposits.

Stratum IV: Fifty burned, unidentifiable mammal fragments were recovered from this stratum which probably represents a dump occurring before the housepit occupation.

Stratum V: Twenty-one salmon bones, 1 unidentifiable bird bone, 2 small mammal, 3 large mammal, and 7 unidentifiable mammal bones were recovered from this stratum, which represents a large pit under the floor deposits. One dentalium shell was recovered from this stratum also.

Housepit 110

HP 110 is a small housepit located on the south side of Keatley Creek on the lowest terrace overlooking the creekbed.

Test excavations have revealed at least three Plateau horizon occupations of the house and one post-abandonment open encampment. Faunal remains were recovered from the following strata.

Stratum II: Forty-nine large mammal and 30 mammal bones were recovered from this stratum. All the bones were burned. Stratum II apparently represents thin roof deposits associated with the most recent house occupation.

Stratum III: Three salmon, 1 grouse (Tetraonidae), 1 unidentifiable bird, 1 deer, 1 red squirrel, 22 large mammal, and 220 unidentifiable, burned mammal bones were recovered from Stratum III. This stratum appears to represent the floor deposits associated with the most recent house occupation.

Stratum IV: Seven salmon bones, 1 artiodactyl ulna, 11 large mammal, and 271 unidentifiable mammal bones were recovered from this stratum. Eighty-one percent of the bones were burned. This stratum represents floor deposits from the second occupation of the house.

Feature 1: Seventeen large mammal and 52 mammal bones, all calcined, were recovered from this hearth associated with Stratum IV.

Feature 2: Thirteen burned large mammal bones were recovered from this pit associated with Stratum IV.

Stratum V: Three salmon bones, 3 hare bones, 14 beaver bones (6 vertebrae, 6 ribs, 2 teeth), 1 scapula and 2 phalanges from bighorn sheep, 3 phalanges and 4 tarsals from deer, 125 burned large mammal bones, and 97 burned mammal bones were recovered from this stratum. This stratum represents floor deposits from the initial occupation of the house.

Feature 3: The remains of a partially burned dog (*Canis familiaris*) skeleton were recovered in one area of Stratum V deposits. The remains were partially articulated, although fragmented from burning, suggesting intentional cremation/burial. The remains included the left and right mandibles, fragmented skull, and fragments of most of the postcranial skeleton. A burned deer phalanx and burned hare humerus were also found in this area.

Housepit 119

See EHPE 5.

Appendix II: Faunal Remains from Housepit 9

HP 9 is a small housepit located southeast from the main part of the site. Excavations in 1990 and 1992 exposed most of the housepit and revealed at least three occupations, the last one dating to the Kamloops phase. The faunal remains from the detailed 1990 and 1992 excavations and the earlier trench excavations are described here. Because it was probably occupied during the same period as HP 12, the late Plateau/early Kamloops occupation (Stratum VIII) is discussed further in (Vol. II, Chap. 7).

Faunal remains were recovered from the following strata excavated in 1990 and 1992.

Stratum IV: Final Occupation Roof

Two shell fragments, 25 salmon bones, 20 mammal bones, 5 large mammal bones, 3 incisors and 1 metatarsal of beaver, 1 canid metatarsal, 1 artiodactyl tooth, and 1 deer scapula fragment were recovered from this stratum (Table 6). A common loon ulna was recovered from this stratum during test trench excavations. A bird bone pendant was found near the bottom of this stratum and may be associated with stratum VIII (Vol. III, Chap. 7). The paucity of remains and the attributes of the remains suggests they are the result of limited refuse accumulation, perhaps from floor cleaning after food preparation. No regular refuse dumping or butchering activities apparently occurred on this roof. Fish remains are much more common on the associated floor (VI) than in these deposits.

Stratum VI: Final Floor Occupation

Three shell fragments; 897 salmon bones; 1 common loon fibula; 115 mammal bones; 27 large mammal bones; 1 hare tibia; 1 beaver incisor; 4 packrat bones; 1 canid phalanx, tarsal, and metatarsal; 32 skull, 8 teeth, and 2 metapodial fragments of artiodactyl; and 7 teeth and 1 phalanx of bighorn sheep were recovered from floor deposits (Table 6). From roof deposits associated with this floor, 67 salmon bones, 1 common loon ulna, 50 mammal bones, 18 large mammal bones, 1 beaver molar, 1 vole mandible, 3 artiodactyl teeth fragments, 1 deer phalanx, and 1 bighorn sheep tooth fragment were found (Table 6). A dentalium shell fragment, a shell bead, a large piece of worked antler, a bone point or awl, a polished bone fragment, and a piece of worked freshwater shell were also found in this stratum. A dump on the floor in Square J, Subsquare 13, contained 46 fish bones, 22 mammal bones, 1 deer molar, and 1 beaver cheek tooth.

The fish remains on this floor are relatively dense compared to other housepit floors and are often partially articulated with the abundant spines and ribs that are present. The fish remains and a concentration of artiodactyl cranial and appendicular fragments near the west wall suggests little trampling or cleaning of floor deposits and may reflect brief usage of the structure as a hunting/butchering base. Alexander (Vol. III, Chap. 7) discusses this distribution further and suggests this occupation may be a short-term camp used by a relatively wealthy family.

Fish remains are much more common in all three floor deposits than in roof deposits. Floor X deposits contain approximately 9 times as many fish bones as Roof XI and Floor VI deposits contain approximately 36 times as many fish bones as Roof IV and the percentage of fish bones in floors ranges from 81–93%, as opposed to 42–70% for roofs. This is consistent with other housepit excavations indicating that roof deposits have significantly fewer fish remains than floor deposits. As noted during field excavations, a large percentage of these fish bones are non-vertebrae, in particular ribs and spines. About 80–90% of the fish elements from the three floor deposits are non-vertebrae. This is higher than was found in other excavated areas of the site. This may simply reflect sloppy housekeeping or different abandonment conditions or it is possible that people were handling fish differently at this pithouse, perhaps butchering and consuming fresh fish.

Stratum VIII: Second Floor Occupation

Four shell fragments; 2,140 salmon bones; 2 bird bones; 253 mammal bones; 42 large mammal bones; 2 beaver incisors and 4 molars; 1 canid tarsal; 2 vole bones; 9 artiodactyl teeth, 1 skull fragment, 1 femur and 1 piece of costal cartilage; and 4 bighorn sheep teeth were recovered from this stratum (Table 6). Four dentalium shell fragments, 2 shell beads, 1 large fragment of worked antler (probably elk), 1 large antler (probably elk) digging stick handle, 1 bone awl, and 19 incised and charred bone fragments were also recovered from this stratum. About three times as many fish bones and five times as many mammal bones were recovered from this floor than from the basal floor. Faunal remains from a large storage pit (fill 1) are probably associated with this occupation (see below). This floor is discussed further in Volume II, Chapter 7.

Table 6. Taxa Recovered from HP 9. Numbers are Numbers of Identified Specimens

Taxon	Stratum						
	IV[2]	VI[1]	VI[2]	VII[2]	VIII[1]	X[1]	XII[2]
Shell	2	3	0	0	4	1	1
Salmon (*Oncorhynchus* sp.)	25	897	67	61	2,140	626	70
Bird	0	0	0	0	2	0	0
Common loon (*Gavia immer*)	0	1	1	0	0	0	0
Bald eagle (*Haliaeetus leucocephalus*)	0	0	0	0	0	0	1
Large mammal	5	27	18	4	42	12	1
Mammal	20	115	50	17	253	23	19
Snowshoe hare (*Lepus americanus*)	0	1	0	0	0	1	0
Beaver (*Castor canadensis*)	4	1	1	2	6	4	0
Packrat (*Neotoma cinerea*)	0	4	0	0	0	0	0
Vole (*Microtus* sp.)	0	0	1	2	2	0	0
Canid (*Canis* sp.)	1	3	0	0	1	0	1
Artiodactyl	1	42	3	2	12	6	3
Deer (*Odocoileus* sp.)	1	0	1	0	0	1	1
Bighorn sheep (*Ovis canadensis*)	0	8	1	0	4	0	4
Total	59	1,102	143	88	2,466	674	101

1. Floor deposits
2. Roof deposits (may contain some floor material)

Stratum XII: Basal Occupation Roof

One freshwater shell fragment, 70 salmon bones, 1 bald eagle mandible fragment, 19 mammal bones, 1 large mammal bone, 1 canid premolar, 1 artiodactyl rib and 2 metapodials, 1 deer mandible, and 1 bighorn sheep carpal and 3 horn fragments, were recovered from this stratum (Table 6). The attributes of these remains are consistent with use of the roof as a briefly-used refuse dumping area. A rabbit tibia "tube" or "bead" was also recovered.

Stratum X: Basal Floor Occupation

This stratum is one of 7 probably intact Plateau floors at the site. One freshwater shell fragment, 626 salmon bones, 23 unidentifiable mammal bones, 12 large mammal bones, 1 hare tibia, 4 beaver incisors, 6 artiodactyl antler fragments, and 1 deer phalanx were recovered from this stratum (Table 6). Their distribution is discussed in Volume III, Chapter 7. The few faunal remains tend to cluster around the periphery of the floor, suggesting the central floor was kept clear of debris and that debris was swept towards the walls. Fish remains are much more common on the floor than in the associated roof deposits (XII) and tend to cluster around the hearth and large pit. A bone pendant; a piece of worked bird bone, possibly from a whistle or drinking tube; and 2 bird bone bead fragments were also found in this stratum. A large piece of unworked antler was recovered from the trench in this stratum. A deer antler digging stick handle is probably associated with a dump on this floor.

Stratum VII

Sixty-one salmon bones, 17 mammal bones, 4 large mammal bones, 2 beaver molars, 1 artiodactyl skull fragment and 1 phalanx, and 2 vole bones were recovered from this stratum (Table 6) which may represent rim slump deposits. A large fragment of unworked antler was also recovered from this stratum.

Test Trench

Two shell fragments and 124 salmon, 1 loon, 1 deer, 1 artiodactyl and 9 mammal bone fragments were recovered from floor/roof deposits. Twenty-two salmon, 24 mammal, 1 beaver, 1 dog, 1 artiodactyl, and 2 deer bone fragments were recovered from rim deposits.

Features

Feature 4: Seven calcined mammal bones were recovered from this hearth.

Feature 5: Fourteen calcined mammal bones were recovered from this hearth.

Feature 8: One unburned mammal bone was recovered from this hearth.

Feature 6: Feature 6 is a large pit feature apparently dug and used for salmon storage during the first occupation (Stratum X) and filled in prior to abandonment. The pit was reexcavated and finally filled in

during the second floor occupation (Stratum VIII). Fill Unit 1 (FU1) contained 1 shell fragment, 82 salmon bones, 6 mammal bones, 1 large mammal bone, and 1 beaver incisor. A large elk antler bark peeler (split and one end worked into a "wedge") and another, smaller, worked artiodactyl antler fragment were also found in FU1. The faunal remains from FU1 are consistent with the interpretation that this is refuse dumped into the pit, apparently during the second occupation.

FU2 contained 5 shell fragments, 487 salmon bones, 23 mammal bones, 5 large mammal bones, 1 loon ulna, 2 artiodactyl bones, 1 beaver incisor, 1 bighorn sheep patella, and 1 hare bone. A worked bird bone fragment, possibly a needle, was also found in FU2. FU2 apparently represents mostly refuse fill deposited during the initial occupation and the fish bones found near the bottom of the pit are probably from the original storage function of the pit.

Discussion

The faunal assemblage from HP 9 contains a number of rather unusual attributes when compared to other excavated housepits at Keatley Creek. HP 9 is a small housepit similar in size to HP 12, but up to ten times as many remains are found on the floors of HP 9 as on the floor of HP 12. While this may simply reflect different abandonment conditions, the presence of unusual items (i.e., loon, dentalium, beads and tubes, eagle, antler artifacts, shell, sheep, fish spines), and relatively high species diversity suggests HP 9 was used in a different way from HP 12. The presence of unusual items and relatively high number of taxa in all of the floor deposits suggests the different usage persisted through time. See Volume II, Chapter 7 and Volume III, Chapter 7 for further discussions.

Common loon (*Gavia immer*) bones were found in HP 9 and have not been found anywhere else in the site to date. The loon bones are as follows: 1 ulna and 1 fibula from Stratum VI, possibly associated with Stratum VIII since cultural material from Floor VIII is incorporated into Roof VI (Diana Alexander, personal communication); 1 ulna from pit feature 6 (FU1, probably associated with Stratum VIII); and 1 ulna from trench C (Stratum IV). The ulna from trench C is also probably associated with Floor VIII occupants since it was found at the bottom of IV (Diana Alexander, personal communication). These bones most likely represent loons collected for ornamental or ritual purposes and not for food. Common loons are found in freshwater lakes and large open rivers during the spring, summer, and fall. They migrate to coastal areas in B.C. in the winter.

Bighorn sheep (*Ovis canadensis*) bones are relatively abundant in HP 9 compared to other areas of the site. The remains are as follows: 1 patella from pit feature 6 (FU2, Stratum X), 1 carpal and 3 horn fragments from Stratum XII (basal occupation roof), 4 teeth fragments from Stratum VIII (second floor), and 8 tooth fragments and 1 phalanx from Stratum VI (last floor). This indicates bighorn sheep were utilized, or their remains dumped, thoughout occupation of the pithouse. The abundant, fragmentary, artiodactyl cranial and postcranial remains on the second and last floors may be from sheep as well as deer and suggests the structure may have been used to butcher sheep and deer.

One dentalium shell fragment was found in Stratum VI and four in Stratum VIII.

Large antler fragments/artifacts were found in the following deposits (see Vol. III, Chap. 2):

Stratum X:	1 large unworked piece from trench.
	Digging stick handle (EeRl 7:5252)
Stratum V:	Large unworked antler fragment
Stratum VI:	Large worked antler fragment (EeRl 7:2176)
Stratum VIII:	Large (probably elk) worked antler (EeRl 7:5253)
	Large (probably elk) antler digging stick handle (EeRl 7:5253)
	Feature 6, FU1 (this is associated with Stratum VIII)
	Large split and beveled elk antler bark peeler (EeRl 7:5251)
	Worked antler fragment (EeRl 7:5256)

Appendix III:
Faunal Remains from Interior Storage Pits

Relatively extensive faunal remains were recovered from interior storage pits in HP 3 and HP 7. The remains from these pits and the possible function of the pits is discussed below.

Faunal Remains from Pit Features in HP 7

Roof Beam Foundations

Faunal remains were recovered from 4 pit features in the east rim of HP 7 in 1988 (P88-2, P88-3, P88-4, and P88-5). These large, shallow, basin- shaped depressions appear to be roof beam foundations (Vol. III, Chap. 6). The faunal remains from these features probably represent debris from infilling and roof collapse. One hundred and fifty-nine bones were recovered from the pits, including 68 salmon (Salmonidae) bones, 2 freshwater shell fragments, 1 fragment each of artiodactyl phalanx, metapodial, and antler, 1 deer (*Odocoileus* sp.) tibia fragment, 3 deer scapulae, 2 sheep/goat (Ovis/Oreamnos) horn fragments, 1 sheep/goat tooth fragment, 21 beaver (*Castor canadensis*) bones and teeth, and 58 unidentifiable mammal bones. Eighteen of the beaver bones and teeth are fragments of one mandible recovered from P88-5. The other beaver remains are 3 incisors, 1 from P88-5 and 2 from P88-2. One deer scapula was found in each of P88-3, P88-4, and P88-5. The scapulae are described in Volume III, Chapter 3.

Thirty-two percent of the bones are burned and 33% of the unburned, non-fish bones are weathered. Forty-three percent of the bones are fish. Sixty-seven percent of the mammal bones are <2 cm in maximum dimension and 32% are from 2–8 cm.

Medium-Sized Pits

Four medium-sized pits (50 cm deep and 70 cm wide) were found in HP 7.

P-34: Square P, 80 cm wide × 55 cm deep. This medium-sized storage pit is located near the northwest wall of the house in association with two other, smaller pits, a large pit (P-31) and a hearth. A total of 132 bones were recovered from the bottom of the pit and the pit fill. One hundred and twenty-two salmon bones were recovered, mostly from articulated salmon remains along the bottom of the pit. Two freshwater shell fragments, 1 artiodactyl long bone fragment, and 7 unidentifiable mammal bones were also found. The pit was apparently originally used to store salmon and then filled with debris.

P-4: Squares P and OO, 87 cm wide × 60 cm deep. This medium-sized pit lies near the north wall of the housepit. One hundred and four salmon bones, 2 beaver teeth, 4 unidentifable mammal bones and the skeleton of a western toad (*Bufo boreas*) were recovered. Toads are burrowers and this individual is probably intrusive. A toad skeleton was also found in a nearby small pit (P-3).

P-36 and P-36a: Square BB, 72 cm wide × 60 cm deep, 81 cm wide × 75 cm deep. This is a medium-sized storage pit located in the northwest corner of the house near 3 large storage pits and a hearth. Nine hundred and thirty salmon bones were recovered, primarily from articulated remains at the bottom of the pit. Also, 1 dentalium shell, 2 freshwater shell fragments, 2 artiodactyl tooth fragments, 1 deer incisor, 1 elk (*Cervus canadensis*) phalanx, 6 beaver incisors, 72 unidentifiable mammal bones, and 1 intrusive vole (*Microtus* sp.) skeleton were recovered. This pit appears to have functioned originally as a salmon storage pit and was subsequently filled with debris.

Large Pit Features

Five large pits (100 cm deep and 70 cm wide) were found in HP 7.

P-25: Square RR, 130 cm wide × 100 cm deep. This large, bell-shaped pit is located near the western edge of the house, near a hearth. A number of large and medium pits and hearths are located just to the north of it. Three hundred and thirty salmon bones, 1 dentalium shell, 1 whelk shell (*Thais* sp.), 1 bird bone, 1 grouse (*Tetraonidae*) wing bone, 6 beaver teeth, 1 beaver scapula, 1 canid incisor, 1 canid metapodial, 1 vole mandible, 1 artiodactyl tooth fragment, and 55 unidentifiable mammal bones were recovered from the pit. Also, 1 deer scapula, 1 bone point or needle, and 1 deer metapodial awl were recovered from the pit. These artifacts are described in Volume III, Chapter 2.

P-4: Square G and U, 65 cm wide × 165 cm deep. This large storage pit is located in the southwest part of the house near another large pit (F-2) and a hearth. A large quantity of fish remains were recovered from this pit (about 1,000 bones), mostly concentrated as articulated

remains at the bottom of the pit and along the sides. Also, 2 beaver incisors, 2 phalanges, 1 metapodial, and 7 tarsals from deer, 1 vertebra, 1 rib, and 1 sternum from artiodactyl, and 40 unidentifiable mammal bones were recovered. Also, a bird bone whistle and a flat, large mammal bone tool were recovered (Vol. III, Chap. 2). Faunal remains from this pit indicate how rapidly the pit was filled after being depleted of salmon stores. Fragments of the same deer individual were recovered from 20 cm BS and 80 cm BS indicating that deposits from at least 20–80 cm BS are part of a single depositional event. This suggests pits were filled in fairly rapidly.

F-2: Square B, 113 cm wide × 120 cm deep. The original storage function of this pit apparently dates to the Plateau horizon. The upper layers of the pit appear to contain Kamloops horizon fill. Three hundred and twenty salmon bones, 1 hare (*Lepus*) metapodial, 3 incisors, 2 ribs, and 2 vertebrae of beaver, 1 pelvis and 1 metapodial of artiodactyl, 3 phalanges, 2 metapodials, 1 metacarpal, and 1 tarsal of deer, 1 bighorn sheep horn core, 1 one bone each of vole and deer mouse (*Peromyscus* sp.), 1 bird bone, and 107 unidentifiable mammal bones were recovered from this feature. One small artiodactyl scapula (sheep/goat?), two deer scapulae, and a bone wedge were also recovered (Vol. III, Chap. 2)

P89-5: Square NN, 130 cm wide × 130 cm deep. Remains of at least 5 dog (*Canis familiaris*) skeletons were recovered from the bottom of this large pit located in the northwest area of the house near the other pit containing dogs (P-31). See Volume II, Chapter 10 for a full description of the canid remains. The remains of the 5, relatively complete but mostly disarticulated, skeletons included 5 skulls and 8 mandibles which could be identified as *Canis familiaris*, 450 bones which could be identified as *Canis* sp., and 400 medium mammal bone fragments which are most probably dog. Also in the layers near the bottom of the pit were 70 salmon bones, 2 deer sternum fragments and 1 deer phalanx, 1 beaver humerus and 1 beaver femur, and 1 large mammal fragment. These remains were apparently dumped in quickly after the dogs were deposited. Upper layers in the pit contained 35 salmon bones, 1 beaver incisor, 24 unidentifiable mammal fragments, and one bone awl.

P-31: Square P, 135 cm wide × 130 cm deep. This large pit feature in the northwest section of the house is associated with three smaller pits and a hearth. It is also near P89-5, the other pit containing dogs. The remains of at least 4 dog skeletons were recovered from the bottom of the pit underneath a plank and layer of birch bark (Vol. II, Chap. 10). The dog remains consist of 1 virtually complete skeleton (NISP=230), 3 other dog skulls, and the partial postcranial remains of at least 2 individuals (NISP=170). Fifty salmon bones were also recovered from the bottom of the pit. Two hundred salmon bones, 12 freshwater shell fragments, 1 bird bone, 2 hawk (*Accipiter* sp.) wing bones, 1 vertebra and 3 phalanges of artiodactyl, 1 scapula, 1 ulna, and 3 phalanges of deer, 1 mandible, 2 phalanges, and 1 molar of beaver, 6 vole bones, 4 deer mouse bones, and 111 unidentifiable mammal bones were recovered from the upper layers of the pit.

Faunal Remains from Pit Features in HP 3

Sq. I, ssq. 3,7: Three hundred salmon bones were recovered from this pit feature.

Sq. F, ssq. 3,4.7: About 1,200 salmon bones were found near the bottom of this pit, many of them articulated. Also 2 freshwater shell fragments (*Margaritifera falcata*), and 2 unidentifiable mammal bones were recovered. This large salmon storage pit appears to have been used during the last occupation.

Sq. AA, ssq. 1,5,6: About 70 salmon bones, 1 deer (*Odocoileus* sp.) phalanx, and 1 hawk (*Accipiter* sp.) phalanx were recovered from this small storage pit which is apparently comtemporaneous with the floor.

Sq. I, ssq. 16: About 100 salmon bones, 1 Canidae astragalus, and 5 unidentifiable mammal bones were recovered from this pit, which may date to Plateau times.

Sq. M, ssq. 2 (89-P1): Thirteen salmon bones, 2 unidentifiable mammal bones, and 2 antler artifacts were recovered from this pit which appears to have been used for storage prior to the final occupation.

Sq. MM (89-P2): Thirty salmon bones, 1 artiodactyl tooth fragment, and 23 unidentifiable burned mammal fragments were recovered from this pit. This feature appears to have been partially filled with hearth cleanings during the last occupation.

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