International Journal of Historical Archaeology
https://doi.org/10.1007/s10761-019-00498-8

Persistence and Meaning in Fur-Bearing Mammal Usage on the Nechako Plateau, British Columbia

Paul Prince[1]

Published online: 22 February 2019

Abstract
The archaeological record indicates the use of salmon and a wide range of terrestrial mammals at sites spanning the last millennium in the vicinity of the Nautley River on the Nechako Plateau of central British Columbia. In particular, a long record of sustained use of small and medium bodied fur-bearing mammals, especially beaver, rabbit, and muskrat, is evident, which neither prey-selection, nor fur trade intensification models adequately explain. Instead, the usage of diverse small prey is best understood in the context of the contingencies and long-term structure of the region's salmon fishery, the social networks between communities and places, the various uses people had for these animals, and the meanings of their relationship to them.

Keywords Fur trade · Zooarchaeology · Colonialism · Subsistence · Canada

> "the world became as it is today, but with two animals only, muskrat and beaver"
> - Narrative of *The Flood* as recorded by Jenness (1934:143).

Introduction

The usage of fur-bearing mammals by foraging societies in North America figures prominently in models of subsistence strategies over long spans of time, and in discussions of cultural changes resulting from the European fur trade. These two interests have been traditionally partitioned between the disciplines of anthropological archaeology and history, or separate specializations in anthropology, and contribute to a conceptual divide between history and prehistory in presentations of the past of

✉ Paul Prince
princep@macewan.ca

[1] Department of Anthropology, MacEwan University, 10700-104 Avenue, Edmonton, Alberta T5J 4S2, Canada

Indigenous peoples. Considerable progress has been made towards critiquing and bridging this divide on several fronts to create more unified views of the past (Lightfoot 1995), but examinations of long-term histories of engagement with fur-bearers at Indigenous sites spanning the Fur Trade Period and earlier times are not common. When interpreting the role of fur-bearers in precolonial economies, zooarchaeologists often assume they were a low ranked prey because of the small body size of most (Lupo 2007; Ugan 2005). Employing a similar logic of economic choices being made based upon a value of return for labor invested in a resource, fur trade scholars (Binnema and Neylan 2007; Fisher 1977; Krech 1984a; Ray 1998) have viewed these animals as increasingly important after contact with Europeans, and hence exploited, which precipitated a series of cultural changes.

The latter issue has been of some interest to ethnologists and ethnohistorians (Goldman 1941; Hudson 1983; Kobrinsky 1977; Murphy and Steward 1956; Steward 1941, 1977) studying cultural interaction in the central interior of British Columbia, and modeling adaptations of the Carrier (Dakelh) peoples who live there. Most studies have been limited by a narrow chronological scope and an acculturation perspective which sees the Carrier peoples as very receptive to both cultural traits introduced through trade with their Northwest Coast neighbors, and to the demands of European traders for furs and food provisions. There also has been a general under-consideration of the history of Carrier people's relationships to animals, other than from an ecological perspective. Further, in the central interior of British Columbia archaeological research has lagged substantially behind the early ethnological studies and has been sporadic and only partially published, as pointed out in attempts to include it in broader extra-regional syntheses of the culture history of either the interior, or northern areas of the province (Fladmark 2009; Magne and Matson 2008). This paper addresses some of these geographical and conceptual gaps in understanding subsistence economies and people's engagement with animals more broadly. The data used are faunal remains recovered from excavations of components dated from the eleventh century CE to the early twentieth century on the Nautley River at the outlet of Fraser Lake on the Nechako Plateau (Fig. 1) – home of the Nadleh Whut'en Carrier. The results indicate significant persistence in the animals selected, particularly small- and medium-sized fur-bearing mammals, long preceding the European fur trade. I suggest this is more than a factor of calculations of energetics by foragers, but is also conditioned by the broader social, ideological, and historical importance of people's relationship with these animals.

Small and Medium Mammals in Fur Trade and Foraging Economies

The historical mercantile fur trade began in central British Columbia as the Northwest Company, and the upstart XY Company, expanded their interests westward toward the Pacific and what would become known as New Caledonia in the late eighteenth century. The first entry of a European trader into the area was the journey of Alexander Mackenzie down the Fraser River and past the confluence with the Nechako in 1793. This was followed by the travels of Simon Fraser 1806–08 to further assess the potential of the region for furs, provisions and transport, and to establish trading posts. He established two trading posts within 50 km of one another on the Nechako Plateau in 1806. Both were in the vicinity of Carrier communities – the Nak'azdli Whut'en on

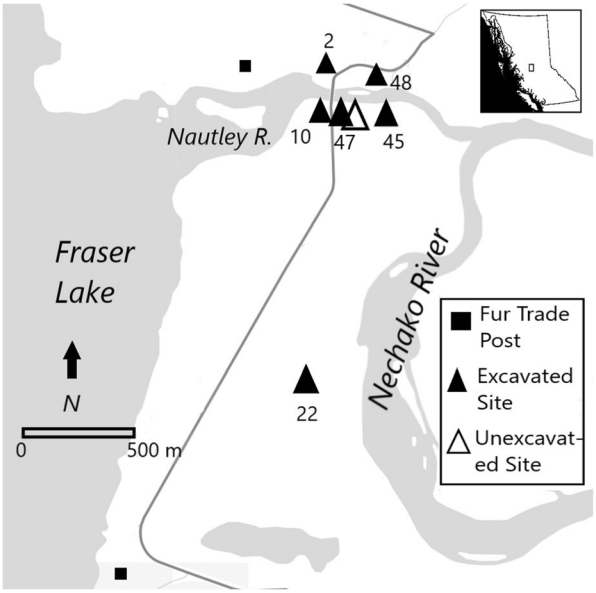

Fig. 1 Map showing the locations of sites used in this study

Stuart Lake and Nadleh Whut'en on Fraser Lake (Fraser 2007:258–260). The posts were initially referred to by the names of the resident First Nations, before eventually becoming known as Stuart Lake Post, or Fort St. James; and Fraser Lake Post, or Fort Fraser. The fur traders deliberately chose these locations, and others, to take advantage of long social, political and economic ties between Indigenous communities which could supply the posts with food – mostly salmon - and furs (Hudson 1983:88). The Fraser Lake Post operated intermittently, going through episodes of burning, falling into disrepair, and being rebuilt before becoming a more stable operation in the 1820s (Rudland 1988:11–14). It was relocated in the 1870s at the entrance to the Nautley River (Fig. 1), immediately adjacent to a Nadleh Whut'en village, and continued in operation there until 1915 (Rudland 1988:23, 31).

Historical overviews of the operation of the fur trade describe the heavy demands European traders placed upon Indigenous peoples in the late eighteenth and early nineteenth centuries to supply them with furs and make their business enterprises a success (Fisher 1977:31; Harris 2007:258; Krech 1984a:100; Ray 1984, 1998:117). The early records of the Stuart Lake and Fraser Lake posts are consistent with these characterizations, and show considerable preoccupation, couched in typically biased rhetoric, with motivating the local people to "make" large quantities of fur (Fraser 2007:259, 261; HBCA 1823, 1824). Throughout North America, the quantity of furs received by European traders was considerable and is presumed to be a result of intensification of harvest on the part of Indigenous peoples (Hamilton 1996:416; Harris 2007:258; Krech 1984b; Nassaney 2015:83; Ray 1984:3). Fur trade history has gradually moved away from focusing upon the enterprising nature of the European traders and treating the Indigenous people as a passive and pliable backdrop, and towards seeing Indigenous people as active and shrewd traders, exercising considerable agency according to their own motives (Binnema and Neylan 2007:4; Nassaney

2015:10). Accordingly, there have been differences in perspective on the motivations for participation in intensive fur hunting, including a desire for presumably technologically superior European goods (Murphy and Steward 1956:352; Steward 1941:497); efforts to form alliances with Europeans and gain advantages in Indigenous political relationships (Fisher 1977:24); hyper-substantivist views of imbalances in people's spiritual relationships with prey (Krech 1999; Martin 1978); and a rational economic desire to maximize wealth and aggrandize positions of power (Bishop 1987; Ray 1998). On the Nechako Plateau, this last point has been particularly compelling given the role of wealth in social ranking, and the relationship of the Carrier to their Northwest Coast neighbors, who are characterized as affluent foragers and holding middleman positions in the European trade prior to the establishment of interior trading posts (Bishop 1987; Fisher 1977). A reading of the fur trader's records identifies the structure of these Indigenous trade relationships, and the perceived advantages of controlling access to sources of European goods (Bishop 1980:196; Fisher 1977:31–33). Contrary to Bishop (1980:196) who argued a privileged few tightly controlled such access, Hudson (1983:86, 94) suggested that the fur trade relationships with Europeans allowed opportunities for social mobility to Carrier peoples of lower rank, and that this, rather than any inherent value, or presumed technological superiority of European goods, motivated increased participation in the European market. Generally, in discussions of changes in the degree of fur trapping at both the local and Pan-North American scale, the nature of people's relationship to these animals has been under-considered, or misrepresented, as in Martin's contentious beaver wars theory (Krech 1987; Martin 1978, 1987), and with a few exceptions (Carlson 2006; Graesch et al. 2010; Williams-Larson 2017; and examples summarized by Nassaney 2015:85–89) little reference has been made to faunal remains at contemporaneous Indigenous sites. This may be in part a consequence of the partitioning of the past between disciplines, and the way we conceptually divide explanations of behaviors and motivations of people in "prehistory" and history (Lightfoot 1995, 2013; Trigger 1986:5).

Zooarchaeologists specializing in precolonial contexts certainly have a well-established interest in the prey choices that foragers made. A common approach when considering the use of fur-bearers, which are generally small, is to place them into the rationale of optimal choices made based upon body size and expected yields of calories and nutrients (Broughton 1994; Lupo 2007; Ugan 2005). Optimal foraging theory, and its companion prey-selection modelling, have proven widely compelling for interpreting chronological trends in the fauna represented in zooarchaeological assemblages, to the extent that the theories can seem to have established universal propositions (Bird and O'Connell 2006:171, 2012:43; Garvey and Bettinger 2014:78–80). Prey-selection especially provides many analysts a consistent framework for understanding what is represented in assemblages and the behaviors behind them. Employing the logic that hunter-gatherers need to capture the greatest amount of energy possible, with the least expenditure, the expectation is that the largest sized prey were targeted preferentially. Other factors like travel, transport, technological requirements of capture, effort involved in processing, risk of failure, and potential prestige acquired may be calculated in the interpretive framework of costs and benefits too (Garvey and Bettinger 2014; Lupo and Schmitt 2002; Stiner and Munro 2002; Ugan 2005). Density is also a factor that can contribute to a prey's relative rank, and this is most obvious with fish and terrestrial game that aggregate seasonally. Generally, though, in western North America

for terrestrial game, large bodied prey (artiodactyls) are considered the prime target, and in instances where smaller game is more abundantly represented, the possibility of resource stress and the subsequent selection of lower ranked prey may be considered (Broughton 1994; Codding et al. 2010; Ugan 2005).

There are also approaches to the interpretation of hunter-gatherer behaviors and choices that give greater consideration to a wide range of social and ideological factors, including deeply rooted historical traditions, world views, cultural values and contingencies of ecological setting and previous actions (Boyd 2017; Cannon 2011a, 2014; Graesch et al. 2010; Russell 2012; Sassaman and Randall 2012). Much of this is part of a broader, decades old trend in archaeology toward treating the deep past as a form of long-term history (Cannon 1998; Hodder 1987; Martindale 2018; Pauketat 2001), which relatively recently came to be applied to hunter-gatherer studies (Cannon 2011a; Sassaman and Holly 2011). An historicist approach has also been increasingly advocated by archaeologists working on colonial contexts as a means of breaking down dichotomies between textually documented and unwritten pasts (Ferris et al. 2014; Lightfoot 1995, 2013; Oland et al. 2012; Rubertone 2000; Schmidt and Mrozowski 2013; Scheiber and Mitchell 2010; Silliman 2010). In large part, this calls upon us to think of peoples, regardless of chronological context, as being engaged in various historical processes, including shaping and adjusting to ecological circumstances and changing political-economic relationships (Cannon 2011b, 2014; Pauketat 2001), as occurred in the fur trade with Europeans. In terms of the structure of subsistence practices of hunter-gatherers, zooarchaeologists may emphasize factors related to cultural tradition, symbolic meaning, ontology, attachment to places and their resources, personal preferences, daily practice, and historical contingencies when explaining what is represented in faunal assemblages (Boyd 2017; Cannon 2011c; Graesch et al. 2010; Holly et al. 2018; Russell 2012). This seems to allow greater latitude to consider animals, and food, as having social and ideological value that may have a role in conditioning change and persistence, than does thinking in terms of optimization strategies alone.

In the case presented here there is opportunity to examine the long-term record of fur-bearing mammal usage from several Indigenous sites in proximity to a fur trade establishment. Some of the sites were contemporary with the trading post, and others preceded it. The documentary record driven tendency to presuppose that Indigenous people simply responded to pressures to supply furs and had a desire to attain trade goods for social and economic motives creates the kind of truncated view of the past criticized above by isolating the Fur Trade Period and leaving the unexamined impression that in earlier times fur-bearing animals were of lesser importance. A more even treatment of the written and unwritten past is attempted, viewing the entire past as a result of complex motivations and a human desire for both innovation and stability in economic and social relations.

Historically Documented Subsistence

Ethnohistoric overviews of the Carrier's seasonal subsistence round make it clear that the primary staple was Pacific salmon (Cranny 1986; Furniss 2004; Hudson 1983; Morice 1889, 1893; Tobey 1981). Currently, three species of salmon travel to these waters in summer and fall to spawn - coho (*Oncorhynchus kisutch*), chinook (*O. tshawytscha*) and, of greatest abundance, sockeye (*O. nerka*). Taken together, they

are estimated to have comprised up to half of the diet prior to the twentieth century (Hudson 1983:58). They were caught by various means, the most important of which were fixed weir and trap facilities, and then preserved by drying or smoking for later consumption. Large villages, primarily occupied in summer, served as hubs of local group territories and were situated along prime migration routes where weirs could be built (Furniss 2004; Hudson 1983). Such is the case with the Nautley River for the Nadleh Whut'en. The numbers of sockeye salmon caught and processed historically is staggering, with the records of Fraser Lake Post indicating harvests of tens of thousands of fish taken from the Nautley River to provision the fur traders alone (Rudland 1988:17).

The scale and intensity of the fishery in the more distant past is difficult to discern, as fish remains are not well preserved in the archaeological record. However, the remains of wood stake fish weirs in the Nautley River dated back as far as the thirteenth century CE provide direct testament to a centuries old and substantial interior salmon fishery and delayed return economy (Prince 2014). Other wooden weirs have been reported in central-northern British Columbia in the Babine River, part of the Skeena River drainage, and may prove as old, or older, to judge from a substantial 1300 year old shoreward settlement (Rahemtulla 2012). More broadly, it is apparent from longevity in settlement at prime salmon fishing locations in the Skeena watershed, and the predominance of tools suited to salmon processing, that interior riverine salmon fisheries existed and were sustained for at least 3500 years (Prince 2011).

While productive and exploited in a sustained manner for several hundred years for subsistence and trade, the sockeye salmon fishery of the Nechako, and greater upper Fraser basin it drains in to, was also subject to drastic cyclical declines at roughly four-year intervals (Ricker 1997). Nineteenth-century fur traders (Harmon 2006:126, 155; McLean 1849:253) and missionaries (Morice 1889:128) depicted these occurrences as major crises and food shortages, although rhetoric of starvation and deprivation may not always be literal (Black-Rogers 1986). It is apparent in nineteenth-century records that a wide range of other animal foods were utilized. This includes other fishes, which except for sturgeon (*Acipenser transmontanus*) were smaller than salmon, and all of which were limited in time and location of availability, as well as density. Economically important fish include lake trout (*Salvelinus namycush*), rainbow trout (*O. mykiss*), mountain whitefish (*Prosepium williamsoni*), lake whitefish (*Coregonus clupeaformis*), burbot (*Lota lota*), Dolly Varden (*Salvelinus malma*), large scale sucker (*Catostomus macrocheilus*), and various small minnows (Cyprinidae) (Booth 2001; Hudson 1983:60). Most were obtained by forays to smaller lakes and streams during winter and early spring and were a critical source of fresh food to supplement diminished stores of salmon. The ethnohistoric record also indicates a wide range of wild fowl were important. Most were migratory, seasonal residents, especially numerous in the fall, including Canada geese (*Branta canadensis*), grebes (Podicipedidae), and several species of ducks, the most abundant of which were American wigeon (*Anas americana*) (Booth 2001:3). Fraser Lake is particularly important habitat for trumpeter swans (*Cygnus buccinator*) which arrive in November to overwinter (Booth 2001:4) and were an important food source.

Of greatest interest for this paper, because they are best preserved archaeologically, figure prominently in interpretations of hunter-gatherer strategies, and were the basis of the fur trade, are the mammals that were taken. The Nechako Plateau, with its large lakes, such as Fraser Lake, and many more medium and small lakes, streams and

wetlands, presents rich habitat for many mammalian species. The ethnohistoric records indicate Carrier peoples, including the linguistically and socially related Wet'suwet'en and Babine Nations of the Skeena watershed, drew upon a wide range of mammals (Table 1). For the purposes of discussion, and to align with the archaeological data, these have been arranged by relative body size. Many of these were of importance for their pelts or hides in the fur trade, but it is evident that most were also consumed (Hudson 1983:64; Morice 1893:93).

Fur traders remarked upon and lamented the general lack of large bodied mammals for food - especially cervids - throughout the Nechako Plateau (Fraser 2007:200, 254; Harmon 2006:126; McLean 1849:289). The largest, and seemingly most abundant cervid in the area today is the moose (*Alces alces*). They are a late nineteenth- to early twentieth-century arrival that became common in the 1920s–30s (Hudson 1983:65; Santomauro

Table 1 List of important historically documented mammals by body size

Body size	Taxon	Common name
Large 70–500 kg	*Alces alces*	Moose[a]
	Cervus elaphus	Elk[b]
	Rangifer tarandus	Caribou
	Odocoileus hemionus	Mule Deer
	Oreamnos americanus	Mountain Goat[c]
	Ursus americanus	Black Bear
	Ursus arctos	Grizzly Bear
Medium-large 20–70 kg	*Canis lupus*	Wolf
Medium 5–20 kg	*Canis latrans*	Coyote
	Lynx canadensis	Lynx
	Castor canadensis	Beaver
	Erethizon dorsatum	Porcupine
	Marmota spp.	Marmot
	Gulo gulo	Wolverine
	Vulpes vulpes	Fox
	Lontra canadensis	River Otter
Small	*Lepus americanus*	Snowshoe Hare
	Ondatra zibethicus	Muskrat
	Martes americana	Marten
	Martes pennanti	Fisher
	Mustela vison	Mink
	Mustela spp.	Weasels/Ermine
	Tamiasciurus hudsonicus	Red Squirrel

Domesticates excluded

[a] Not common before twentieth century

[b] Not common during Fur Trade Period

[c] Not locally available

Sources: Cranny 1986; Daly 2005; Fraser 2007; Harmon 2006; Moran 2007; McLean 1849; Morice 1893; Hall 1992

et al. 2012) and have thrived in the dense forest cover and wetland environments of the western boreal forest, being well adapted to the deep winter snow pack. Prior to this, elk (*Cervus elaphus*) were recalled by elders to have been present in the area and to have been of some importance (Hall 1992:13; Morice 1893:93). Mule deer (*Odocoileus hemionus hemionus*) are native to the area but were seemingly never abundant (Blood 2000). Formerly, the most abundant cervid was woodland caribou (*Rangifer tarandus caribou*). Their numbers have declined since the arrival of moose and fragmentation of their habitat by industry (Santomauro et al. 2012). It seems, however, that they were rare in the lowlands around village settlements, being more common in the surrounding mountains (Santomauro et al. 2012). Hunting forays were thus required for caribou, which carried a risk of failure (Fraser 2007:274; HBCA 1823). It would seem, then, that cervids, which general foraging models emphasize were preferable because of their size, may not have been widely available or numerous enough to be a main staple for the Carrier throughout most of the past (Hudson 1983:58). Smaller bodied mammals, such as beavers, hares, marmots, dogs, and muskrats, as well as birds, are more often mentioned as food by the Europeans (Fraser 2007:105, 140, 255; Harmon 2006:128, 158; HBCA 1823, 1824; McLean 1849:253, 260, 267, 289).

Further, although ethnocentrically reasoned, the fur trader McLean (1849:253–54) suggested that hares were turned to in compensation for failures in salmon. This reference to small prey – hares – as a fallback resource is reminiscent of the artiodactyl index of prey selection theory, used to measure fluctuations in the relative proportions of small prey (lagomorphs) and large prey (usually cervids) over longer times and to infer subsistence stress or ecological changes. Lagomorphs are most often regarded in analyses of forager subsistence strategies as low ranking, fallback resources because of their small size and low meat yield relative to the costs of pursuit and processing (Ugan 2005). They thus are not typically considered a sustained focus of foragers, and may be expected to fluctuate in abundance within zooarchaeological assemblages over time (Broughton 1994; Codding et al. 2010). Some of the cost is argued to be off-set by using traps, snares, and mass netting as means of capture, although the risk of failure and handling times remain high (Lupo 2007:156; Ugan 2005:82). The ability to take lagomorphs and other small prey within short forays of settlements by a wide segment of a group, the social benefits of cooperative hunting, the fast reproductive rate of small mammals and the tendency of some rabbit species to aggregate in warrens have also been considered in assessments of diet breadth (Jones 2006; Lupo and Schmitt 2002; Lupo 2007:156; Stiner and Munro 2002). In the case of the Nechako Plateau, the only native lagomorph is the snowshoe hare (*Lepus americanus*), which does not aggregate in warrens, but burgeons in numbers at 10 year intervals, after which they decline (Krebs et al. 2001). It seems unlikely that snowshoe hares by themselves could fulfill the need to replace shortfalls in salmon, as they could not be mass harvested and stored like salmon, and the peaks in the hare population cycle cannot be expected to predictably synchronize with the down-cycles in the sockeye population. What McLean may have observed could be increased predation upon hares by humans during peaks in their cycle, as well as the importance of diversity, given the instability of the fishery. Further, the missionary and amateur ethnologist Father Morice (1893:103) relates the use of relatively low-cost snaring techniques that may have helped make hares a relatively more reliable prey. Overall, the documentary record can be taken to indicate that small game was routinely utilized in the nineteenth

century (Hudson 1983:58), a situation brought into sharper focus by salmon shortages. To date, however, archaeology has not much informed our understanding of subsistence practices in the study area in the long-term, or whether participation in the commercial fur trade changed the relative importance of small- and medium-sized prey.

Archaeological Sites in the Study

Site Locations and Investigations

The faunal assemblages excavated from six sites in the vicinity of the Nautley River were examined first hand (see Fig. 1). Four of these (GaSd-22, GaSd-45, GaSd 47, and GaSd-48) were excavated by the author, and two (GaSd-2 and GaSd-10) were excavated by the consulting firm Archer under the direction of Frank Craig (Archer 2008). The sites excavated by the author all underwent screening of their matrix through nested 6.3 mm and 3.2 mm mesh. At sites GaSd-2 and GaSd-10, 6.3 mm mesh screens were used in all contexts, with 3.2 mm mesh being additionally used to screen one quadrant of each excavation unit at GaSd-10. The difference in screening strategies seems to have had the greatest effect upon the numbers of small, unidentifiable fragments of cortical bone that were recovered, which were very high where 3.2 mm mesh was employed. This category of faunal remains is eliminated from most of the site comparisons made here.

Sites GaSd-2 and GaSd-48 are on terraces on the north side of the Nautley River. Archaeological deposits in this area have been disturbed by infrastructural developments, and both sites were initially investigated in conjunction with testing along a proposed bridge and road realignment (Archer 2008). Site GaSd-2 is close to a stream that runs southward along its western edge through a gulley towards the Nautley River. A few hundred meters to the west of the stream was the last location of the Fraser Lake Post. Craig's investigation included the excavation of 29 positive shovel test pits extending southward across the level terrace and downslope toward the river's edge, and two 1 × 1 m excavation units, yielding a total of 1059 faunal specimens.

Site GaSd-48 is a small habitation area to the east of GaSd-2 where surface material was exposed during road work for the bridge project. A photograph dated 1905 (BCA 1905) shows a post-and-beam house in the general area resembling a style Morice (1893:188) equated with summer occupation. We excavated two units and uncovered several house features, including postmolds, a large fire-cracked-rock filled hearth, and a compacted earthen floor (Fig. 2), but no European trade goods. A total of 242 faunal specimens was recovered from the excavation and surface locations.

Site GaSd-10 is on a level terrace on the south side of the Nautley River to the west of the bridge. Its boundaries have been roughly defined by various compliance projects, which have acknowledged that the site is certainly much bigger than the area that has been investigated. The most recent investigations were associated with bridge realignment and included systematic excavation of 27 positive shovel test pits, four 1 × 1 m test units, and screening of sediments removed by construction machinery along the right-of-way (Archer 2008), producing a total of 408 faunal specimens.

Site GaSd-47 is on the same topographic terrace as GaSd-10, only to the east of the road and bridge. Although the division between these two sites is based in part on

Fig. 2 Photograph of excavations in Site GaSd-48 facing south showing hearth feature in profile at right, postmold to the left and post holes in unit floor

modern features and the history of investigation, there are distinct cultural features at GaSd-47 that define it as a habitation and general activity area. These include two shallow sub-rectangular house depressions, and a deep midden deposit (Fig. 3). The midden runs along the foot of a higher terrace that trends northeastward along the eastern margin of the site. Houses, fish processing and storage acilities stood on the higher terrace during the late nineteenth to early twentieth century (BCA n.d.). The high terrace has never been investigated archaeologically, but thick cultural deposits are visible eroding from along an undercut bluff that faces the river, and some material in the midden at GaSd-47 likely originates from activities on this higher terrace. Our excavations at GaSd-47 occurred in the midden, the house depressions and a general activity area near the river, and produced the largest faunal assemblage employed in this study, at 4262 specimens. The sub-rectangular shapes of the house depressions bear vague

Fig. 3 Photograph of site GaSd-47 facing north showing excavation units in house depressions. The higher terrace is to the right. Midden deposits occur at the base of the slope. Excavations also occurred in deposits facing the river

resemblance to Morice's (1893:189-190) description of a kind of winter lodge Morice (see also Cranny 1986:44–46), and the depressions may have provided some insulation, consistent with winter dwellings. However, the features also have similarities to above ground houses Morice called ceremonial lodges, typically used in the summer months through the salmon season (Cranny 1986:43; Morice 1893:185–187), and the ethnologist Wilson Duff (1951:30) was told of at least two such houses in this general area. The kinds of fauna recovered are diverse, and include salmon, which could have sustained summer through winter occupation. Given the proximity of the riverfront area to a section of the Nautley River containing remnants of wood stake fish weirs dating from the late seventeenth to early twentieth century CE (Prince 2014; Traces 2003), and a relatively large amount of salmon remains recovered from excavations there, it is posited that salmon processing was among the activities that occurred in this area.

Site GaSd-45 is a stratified site on a low terrace 500 m to the east of GaSd-47 and separated from it by the uninvestigated site on the high terrace mentioned previously (Fig. 4). Its designation as a separate site is mainly based on elevation differences and the history of investigations, but it also contains distinct deposits. There are remains of a wooden stake fish weir immediately off-shore in the river dating back to the sixteenth century and photographs of the low terrace near the river's edge being used as a salmon processing station in 1909 (BCA 1909; Prince 2014:126). Excavations occurred near to the river's edge in this level area, and at the base of the higher terrace, producing a total of 517 faunal specimens. The excavations near the river's edge revealed stratified deposits of river sands and silts covering a series of organic rich paleosols proceeding to depths of at least 1 m below surface. Identifiable faunal material, including salmon remains resulting from fish processing shoreward from the weir, was limited to the upper layers in this area. Excavations at the base of the high terrace indicated a complex process of slumping of some deposits downslope, in addition to the accumulation of material disposed of over the terrace edge. The historical and archaeological evidence for use of the site during salmon fishing season clearly places it in late summer, but there are other faunal remains, including migratory waterfowl, that could be indicative of a spring season, and small mammals that could have been taken in winter.

Fig. 4 Photograph of Site GaSd-45 facing south with the high terrace to the west. Weirs were erected in the river immediately in front of the site

Site GaSd-22 is inland from the river terraces in a sheltered sand dune environment. The main feature at the site is a single depression, 7.5 m in diameter, representing the remains of a circular pithouse (Fig. 5). Excavation was conducted on the rim of the housepit and its interior, and defined roof-fall, interior bench, post and hearth features. Fur trade goods including glass beads, gunflint fragments, shot, a ferrous metal arrowhead, and a copper bracelet were recovered and place occupation in the 1800s. There is no evidence of earlier occupation. A small assemblage of 282 faunal specimens was recovered, mostly from the hearth. The faunal material, and the subterranean house type, are indicative of a winter occupation (Morice 1893:191).

Chronological Organization of Components

To better examine diachronic trends in the animals used, the faunal assemblages from the six sites have been roughly grouped into two chronological frames: Fur Trade Period and Pre-Fur Trade Period. A combination of radiocarbon dates (Table 2) and artifact associations were used in the assignment of faunal material to these chronological periods. Note, all radiocarbon dates are derived from charred wood and are discussed in terms of their two-sigma calibrated age ranges. On the Nechako Plateau, the Fur Trade Period spans the nineteenth century, and ends after about the first third of the twentieth century as industry and settler economies became dominant in the area and the value of furs dropped (Hudson 1983; Tobey 1981:481). Faunal materials from uncertain proveniences or suspected of being of mid-twentieth century or modern origin based upon artifact associations, while listed in Table 3, have been eliminated from subsequent comparisons. Pre-Fur Trade here simply means prior to the entry of Europeans and the trade goods that may have preceded them in the archaeological record by a few decades. In these data, it encapsulates components dating back to around 1000 CE (see Table 2). Two chronologies have been proposed in the most recent culture-historical syntheses that include the Nechako Plateau, both of which lump together large spans of time based on very broad trends in projectile point types and a few radiocarbon dates derived from sites on the periphery of the study area. In Fladmark's (2009) sequence, the sites in this study fall into the Late Stage, Sub-Stage II (1500/1200–200 BP), and according to

Fig. 5 Photograph facing south of some excavation units in housepit at GaSd-22

Table 2 Radiocarbon dates from terrestrial components

Site	Context	Radiocarbon age B.P.	2 sigma calibrated age range (CE)*	Lab #
GaSd-48	House Floor	360 ± 20	1456–1632	ULA 1394
GaSd-48	House Hearth	165 ± 15	1666–1950	ULA 1638
GaSd-47	House 1 Floor	355 ± 20	1459–1633	ULA 3024
GaSd-47	House 2 Floor	330 ± 20	1488–1640	ULA 3023
GaSd-47	House 2 Post	655 ± 20	1282–1390	ULA 3022
GaSd-47	Midden	810 ± 15	1212–1263	ULA 3030
GaSd-47	Midden	945 ± 20	1027–1154	ULA 3029
GaSd-45	Feature 1	160 ± 15	1667–1947	ULA 1639
GaSd-45	Palaeosol	360 ± 20	1456–1632	ULA 5887
GaSd-45	Palaeosol	280 ± 15	1523–1658	ULA 1640
GaSd-45	Palaeosol	685 ± 20	1273–1385	ULA 5886
GaSd-45	Midden – Slumpage	395 ± 15	1445–1614	ULA 5889
GaSd-45	Midden – Slumpage	895 ± 15	1046–1208	ULA 5890
GaSd-45	Midden – Slumpage	950 ± 15	1025–1154	ULA 5888

*Calibrations by OxCal 4.2, IntCal 13. The maximum age range is reported. All samples are charred wood

Magne and Matson (2008), they more broadly belong to the Late Prehistoric Period (3500–100 BP). As is typical of culture histories that rely upon broad consistency in technological traditions, these chronologies do not accommodate variation well, and can form an impression of very long intervals of stasis, preceding sharp disjunctions with the beginning of European history. The chronology employed here also uses the advent of a kind of European colonialism – the fur trade – as a horizon marker, but it is not meant to serve as a sharp divide separating recent people from their history, a static baseline from

Table 3 Total NISP in each site assemblage by taxonomic class and major categories of mammals

	GaSd-2		GaSd-10		GaSd-47		GaSd-48		GaSd-45		GaSd-22	
Taxonomic class	f	%	f	%	f	%	f	%	f	%	f	%
Fish	151	14.3	51	13	395	9.3	11	4.5	203	39.3	5	1.8
Bird	14	1.3	22	5	182	4.3	7	2.9	51	9.9	6	2.1
Mammal												
Identified mammal (Family, Genus or Species)	137	12.9	24	6	440	10.3	24	9.9	66	12.8	40	14.2
Unknown large mammal	1	0.1	–	–	1	0.0	–	–	3	0.6	–	–
Unknown medium-large mammal	3	0.3	1	–	5	0.1	–	–	–	–	1	0.4
Unknown medium mammal	6	0.6	5	1	21	0.5	1	0.4	2	0.4	4	1.4
Unknown small mammal	135	12.7	9	2	75	1.8	4	1.7	12	2.3	7	2.5
Unidentified mammal	612	57.8	296	73	3143	73.7	195	80.6	180	34.8	219	77.7
TOTAL	1059	100	408	100	4262	100	242	100	517	100	282	100

which to measure colonial change, or as a means of defining different kinds of history. Instead, the goal is to be consistent in analysis of the faunal evidence across time and maintain a focus upon the use of fur-bearing mammals, for which the definition of a Fur Trade Period is critical. Further, as a heuristic division the two-fold chronology facilitates the organization of samples into bigger, yet still meaningful groupings, that permit a larger scale and potentially more convincing assessment of broad trends in animal use than would be possible through site to site comparisons with such small samples. While finer scaled chronological comparisons within regions are advantageous for nuanced treatments of colonial entanglements and adjustments made within individual communities (Ames and Brown 2018; Silliman 2009: 222), a cruder chronology remains appropriate for longitudinal studies of Indigenous relationships to resources and other ecological variables (Lightfoot 2013).

Radiocarbon dates are not available on site GaSd-2, but the artifacts recovered in most of the test pits, and throughout the artifact bearing layers of both excavation units, include a variety of nineteenth-century ceramic, glass and metal items (Archer 2008). Lithic artifacts were also recovered, but none are temporally diagnostic and they could be contemporary with the trade goods. Given the diverse artifact assemblage, and the proximity of the site to the Fraser Lake trading post, the faunal assemblage is grouped with Fur Trade Period assemblages in the comparisons made below.

The excavation at nearby site GaSd-48 produced two radiocarbon dates from house features: one, from the floor, with a two-sigma calibrated age range in the mid-fifteenth to mid-seventeenth century CE; the other, from the hearth, with a very broad age range from the mid-seventeenth century to CE 1950 (see Table 2). These dates indicate house occupation prior to the Fur Trade Period at this site, and that some of the features excavated could be contemporary with historically documented houses in the area. However, no European trade goods were recovered and the lithic assemblage includes small side-notched projectile points, conventionally broadly assigned to "Late Prehistory" (Fladmark 2009:595), and perhaps contemporary with more precisely dated Kamloops Horizon types (1200–200 BP) from southern British Columbia (Magne and Matson 2008:285; Rousseau 2008:243). The excavated faunal material is thus grouped with Pre-Fur Trade Period components for the analyses that follow, after removing surface finds from the data, which were potentially deposited in modern times.

Of the sites along the south side of the Nautley River, no material from Site GaSd-10 has been radiocarbon dated. A very small number of nineteenth-century artifacts were recovered, and modern twentieth-century material was noted in the upper layers of the excavation (Archer 2008). The bulk of the artifacts recovered are lithic and include small side-notched projectile points and stemmed Kavik type projectile points, generally considered contemporary with, and sometimes associated with, the small side-notched types (Fladmark 2009:594; Magne and Matson 2008:284–286). For the purposes of chronological comparisons, the faunal material excavated from secure contexts has been treated as Pre-Fur Trade Period, while the material recovered from the backdirt of machine excavation has been excluded from consideration because it is from mixed deposits.

At nearby Site GaSd-47, examples of the same projectile point types were found, and several radiocarbon dates were run. The oldest part of the site was the midden, with samples from two basal lenses producing date ranges from the mid-eleventh to mid-thirteenth century CE. The floors of each of the houses yielded dates in remarkable agreement, with ranges in the mid-1400s to mid-1600s (Table 2). An earlier date was

derived from a sample of charred wood in a postmold from one of the house depressions. This could potentially represent an earlier stage in the life of the house, or because the sample was very small, it could be a date from the inner most (old wood) layers of a log that was used as a support post in the house. Few trade goods of European origin were recovered from GaSd-47, beyond the upper layers of the midden deposits. Faunal material from those layers and the upper layers of the house depressions have been grouped together with the Fur Trade Period assemblages for comparison. The rest of the faunal material from GaSd-47 is grouped with the Pre-Fur Trade Period material.

Several radiocarbon dates are available from site GaSd-45. The deepest of the stratified paleosols uncovered in excavation units near the river's edge yielded dates calibrated from the late thirteenth to late fourteenth century CE, but no bone or artifacts were recovered from the deposits. Dates from the middle layers fall in the fifteenth to seventeenth century CE and are associated with a small amount of unidentified bone. The upper layers in this area yielded historical artifacts, a small amount of bone, and a radiocarbon age range from the late seventeenth to twentieth century. Excavation in deposits at the base of the high terrace produced two dates from the lowest layers with age ranges broadly in the eleventh to twelfth centuries CE, but they are not associated with any recovered bone. A sample from the midpoint of the stratigraphic sequence here yielded a mid-fifteenth to early seventeenth century date and is associated with a small amount of bone. It is overlain with complex, discontinuous deposits containing a range of historical artifacts and the bulk of the site's excavated faunal specimens. So, although the radiocarbon dates indicate a long history of use for the site, because the vast majority of the faunal material, and virtually all of the identifiable material is associated with nineteenth- and early twentieth-century artifacts, the faunal assemblage of the site is included with Fur Trade Period components.

No radiocarbon dates were run on material from site GaSd-22, but based on artifact associations and a lack of stratigraphic evidence for repeated occupation, the faunal material is firmly assigned to the Fur Trade Period.

Faunal Assemblages

Faunal preservation at each of the sites in this study was generally poor, as the soils are acidic. Most of the specimens are small and fragmentary, and many have been burned to a calcined state. The net effect of fragmentation, whether the bone is calcined or not, is to produce large quantities of cortical fragments that could not be identified to element or taxa by morphology below the level of the mammalian class. The NISP of each assemblage is dominated by such fragments (see Table 3), except for at site GaSd-45, where fish remains are slightly more abundant. This is not surprising given the use of this site's shoreward area for salmon processing. Fish bones at the other sites are much less abundant than those of mammals, and more reflective of a variety of storage and consumption activities associated with places of residence. Site GaSd-22 stands out as having the lowest proportion of fish, and a complete lack of salmon. All of the sites also have relatively low amounts of bird remains, most of which are not identified below the level of class. While they were historically important to the subsistence economy, the remains of birds may be subject to density mediated destruction, affecting both their preservation and identifiability.

Overall, the assemblages are dominated by mammal remains, and it is the composition of this portion of the assemblages that is most pertinent to questions about the long-term use of fur-bearing animals. In addition to specimens that are only identified to the mammalian class, Table 3 also includes specimens which were identified to element, or body part, as well as relative body size, but were not sufficiently diagnostic to assign to family, genus or species of mammal with confidence. For these, the size grades small (0.25-5 kg), medium (5–20 kg), medium-large (20–70 kg) and large (70–500 kg) have been employed. Of these size grades, the unidentified small mammal category is most abundant at each site. Although in some cases the sample sizes are small, it certainly points to the economic importance of small mammals, and perhaps the differential effect of fragmentation upon identifiability. Many of the small mammal specimens escaped fragmentation entirely, and in cases where they are broken, they more often retained diagnostic features, or at least entire shaft circumferences that allow their identification to body size. Fragmentation is most problematic for the identification of large bodied mammals in which articular facets and other diagnostic features may be missing or too incomplete for firm identification, making the large size class underrepresented in the assemblage – an issue considered further in the discussion of the more precisely identified taxa.

The numbers of mammal bones identified to family, genus or species at each site is relatively small in each case, ranging from six to 14.2% of the total NISP. In order to have more robust samples of precisely identified specimens to work with, and to better see diachronic patterns in the representation of different mammals, some of the taxonomic categories have been trimmed, and site assemblages have been lumped by time period in the following analyses. Table 4 thus shows the gross division between Fur Trade and Pre-Fur Trade Period components, and the remains of birds, fish and completely unidentified mammals have been omitted. It also should be noted that the taxonomic category cervid (family Cervidae) includes a few specimens firmly identified as deer (*Odoicoileus* sp.), and others identifiable only to the deer family, which may include woodland caribou. They have been lumped together to increase the numbers in the category. The much larger and temporally limited moose, however, have been referred to by their more precise name because they are limited to the Fur Trade Period, and, therefore, cannot be compared across time. Similarly, the inclusive family level category canid (Canidae) has been used for a few specimens identifiable as wolf (*Canis lupus*), and others that may be either large coyote (*Canis latrans*) or dog (*Canis familiaris*). The distinctive fox (*Vulpes vulpes*), however, has been listed separately because they are much smaller and do not fit the same size category – a focus of these analyses. Temporally, site GaSd-47 has faunal material from both periods, and its assemblage was divided accordingly. Specimens from badly disturbed or uncertain contexts at site GaSd-10 have been omitted. While this chronological and taxonomic organization compresses some potentially interesting variation between sites and seasons of occupation, as discussed earlier, the resolution of the chronology and the sample sizes from individual sites are not sufficient for convincing site to site comparisons, and this organization of the data better fits the goal of seeing broad diachronic trends in the use of mammals of different sizes.

The large mammals of the Fur Trade Period include a few specimens of introduced domesticates – horse and cattle. Bear (*Ursus* sp.) is represented in both periods, but is more abundant in the Fur Trade Period, being mostly accounted for by several specimens from site GaSd-45 that may represent a single individual. The most abundant large mammal

Table 4 NISP of Pre-Fur Trade vs Fur Trade mammalian taxa

		Pre-Fur Trade		Fur Trade	
Taxon	Common name	f	%	f	%
Unidentified large mammal		1	0.2	4	0.9
Equus caballus	Horse	–	–	3	0.7
Bos taurus	Cow	–	–	2	0.5
Ursus spp.	Bear	1	0.2	16	3.6
Alces alces	Moose	–	–	6	1.4
Cervidae	Deer/Elk/Caribou	20	3.5	26	5.9
Unid medium-large mammal		6	1.1	4	0.9
Canidae	Wolf/Large Coyote/Dog	42	7.4	9	2.0
Unidentified medium mammal		27	4.8	12	2.7
Vulpes vulpes	Fox	–	–	1	0.2
Castor canadensis	Beaver	173	30.6	57	12.9
Marmota spp.	Marmot	6	1.1	–	–
Lontra canadensis	River Otter	1	0.2	–	–
Erethizon dorsatum	Porcupine	4	0.7	–	–
Lynx canadensis	Lynx	1	0.2	–	–
Unidentified small mammal		84	14.9	154	34.8
Ondatra zibethicus	Muskrat	82	14.5	69	15.6
Lepus americanus	Snowshoe Hare	107	18.9	64	14.4
Martes americana	Marten	7	1.2	14	3.2
Martes pennanti	Fisher	–	–	1	0.2
Tamiasciurus hudsonicus	Red Squirrel	2	0.4	1	0.2
Mustela spp.	Weasel/Mink	1	0.2	–	–
TOTAL		565	100	443	100

remains in both periods, though, are cervids. These are most certainly underrepresented due to the effect of fragmentation upon level of identifiability, although the degree of bias is unknown. For instance, six large fragments of unidentified mammal cortical bone from Pre-Fur Trade Period contexts at site GaSd-47 were selected for thin-sectioning and examination of their histological structure. Four of the six specimens proved to have a plexiform configuration, diagnostic of artiodactyls (Greenlee and Dunnell 2010). The most likely artiodactyls in this case would be cervids, indicating their presence, but not relative abundance. Canid remains are well represented in both periods but appear more important in Pre-Fur Trade contexts in which they may have had a greater role as food, as discussed below. Of the medium sized taxa, there is a greater range in the Pre-Fur Trade assemblages, with small amounts of marmot, otter, porcupine and lynx, which were not identified in the Fur Trade Period components, but are mentioned in the ethnohistoric literature.

Each mammalian taxon mentioned thus far represents less than 6% of the total amount of mammal remains of a period by itself. What is most striking when comparing the relative proportions of mammalian taxa is the commonality evident across time in the four most abundant taxa – which includes unidentified small mammals. Again, this points to

an emphasis upon smaller-bodied mammals. The specimens in the unidentified small mammal category would logically include species used for their furs, some of which could also be seen as food. By further isolating those taxa most precisely identified it becomes apparent that the three most abundant in both time periods are beaver, muskrat and hare, which would have been significant for their fur, and as food (Fig. 6). While the sites are lumped by period here, it is notable that these three taxa are ubiquitous, being represented in each site assemblage. In the Pre-Fur Trade Period, beaver stands out, comprising more than 30% of the mammalian taxa, and being the largest single category. They are followed in abundance by hare and muskrat, and among fur-bearers, more distantly by canid remains. All other fur-bearers occur in very small numbers. In the Fur Trade Period material, the smaller bodied muskrat and hare appear in similar numbers to those of beaver remains and may have been substantially greater in use when the possibility that they are among the unidentified small mammal remains is considered. These results clearly indicate that fur-bearing mammals were not suddenly drawn to the attention of Indigenous hunters as a prey target by the European fur trade, and that medium- and small-bodied prey were significant over a long span of time. Explaining this requires further consideration of the possible uses and cultural meanings of these animals, rather than simply the economic pushes and pulls of the European fur trade market.

Discussion

Although there is variation in the range of mammals represented in the Nautley River sites over time, and in the relative proportions of some individual taxa, there is, throughout, persistence in the importance of fur-bearers. Clearly, a variety of fur pelts were being used upon first recorded contact with Europeans, as noted by the fur traders (Fraser 2007:200,

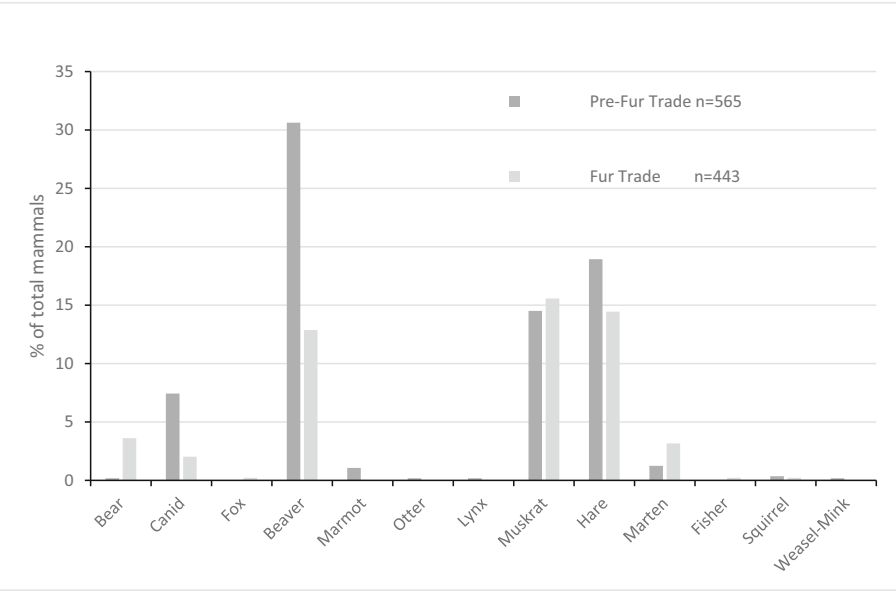

Fig. 6 Graph of fur-bearing mammals in the Fur Trade and Pre-Fur Trade components

248). Chief among the furs in possession of Indigenous people of the Nechako Plateau was beaver, but in assessing the potential of the area, marmot, hare, weasels, mink, bear, otter, lynx, marten and muskrat were also noted (Fraser 2007:248; McLean 1849:288). That these and other fur-bearers are well represented in archaeological contexts long preceding the fur trader's observations attests to their importance. The ethnohistoric descriptions of Indigenous culture by Morice (1889:116, 137) indicate the importance of fur pelts as a practical adaptation to the harsh winters of the boreal forest through use in clothing and bedding. Morice (1889:137) also indicates their use in essential pieces of technology, along with the hides and sinew of caribou. In these regards skins of mammals would have been necessary to even the earliest adaptations to this environment. The prevalence of lithic hide scrapers throughout the archaeological record (Clark 1991:10; Donahue 1973:175; Fladmark 2009:583) attests to the early and enduring importance of preparing skins of various kinds. Ethnohistoric sources indicate a role for fur pelts in Indigenous exchange networks too, especially with Northwest Coast peoples (Hudson 1983:84; Tobey 1981:424). The perishable remains of pelts are not evident in Pre-Fur Trade Period assemblages, but lithic materials which are traceable to discrete sources are, and pelts may well have been among a number of goods circulated.

Aside from fulfilling technological roles, including the practical necessity of warmth and shelter, and playing a role in socio-economic networks, the ethnohistoric literature indicates pelts of animals were emblems of social position and gender identity. In particular, Morice (1889:116–117) described the skins of animals, including beaver, hare, lynx and marmot, displayed in elements of dress, and as standards positioned on lodges, indicating the rank of the owners. Morice (1889:116) and Hall (1992:10) also described variation between genders in the use of pelts as elements of dress, with hare being associated with women, and marmot being used in the winter hats of men. Such broader social uses of furs, while not directly evident in the archaeological record, may also have been in practice prior to the European fur trade. Further, comparing the faunal remains across time makes it clear that a Fur Trade Period shift towards focusing upon taking fur-bearing animals is not apparent. The most desired species of the historical fur trade, beaver, is actually more abundantly represented in the earlier assemblages, as are a wider range of other fur-bearers.

Among the uses of many of the fur-bearing mammals was their consumption. Bear was commented on by McLean (1849:288) as being the most common large game, and its meat and fat were widely consumed. Dog was also consumed, and frequently presented as a meal to Fraser (2007:105, 140–141). Plausibly, wolf and coyote were consumed too. Beaver was a particularly important and valued food during the Fur Trade Period, and logically would have been one earlier. Marmot, porcupine, otter and lynx can also be included in the food list, although in accordance with taboos, the consumption of the latter two may have been limited to men (Hall 1992:25; Morice 1893:108). Of the small mammals recovered, hares and other lagomorphs are widely consumed by foragers, as are muskrats (Kamp et al. 1998:140). But even the smallest mammals, squirrels, are listed among the Carrier's food by Furniss (2004:207).

Certainly, from an ecological perspective this diversity in prey, and the relative importance of medium and small mammals is in large part a long-term adaptation to the structure of resources, salmon being abundant, but highly variable year to year; artiodactyls being relatively scarce; and diversity in pursuit of fish and game, including those of smaller sizes, being favored. In contrast to hunting patterns where a variety of

game is available and chronological variation in the ratio of large- to small- bodied prey has been found and used to infer resource depression and adjustments in hunting behavior (Broughton 1994; Lupo 2007:159–161), there are no perceivable fluctuations in the use of small game relative to big or more densely aggregated prey in these data. Instead, the two most important small mammals – muskrats and hares – show remarkable consistency in their representation over time, and beaver remains, while they show a drop between periods, are also important in both.

The prominence of these three particular species over time deserves some attention. The likelihood of routinely capturing hares within the limits of their population cycle employing locally made traps and snares has already been discussed. Similarly, muskrats, while not usually cited in the calculus of optimal foraging theory, by virtue of being small, may also be less typically expected to be a highly ranked game. They have some desirable traits as prey, including a high reproductive rate, life in small colonies using a limited range, construction of small houses of vegetation that are highly visible (Boutin et al. 1988), and they were easily targeted by the Carrier with hand-made traps (Hudson 1983:64). They too, however, go through population cycles at four to ten year intervals (Erb et al. 2000:1110), and pose further drawbacks to humans as a sustained food because of parasites (Kamp et al. 1998:146).

The larger bodied, meatier and fatter beaver also presents a visible and predictable target because of its lodges and colonies and was taken prior to and after the introduction of metals with various ingenious hunting, trapping, and netting technologies (Hall 1992:23; Hudson 1983:103; Morice 1889:132; 1893:98). Beavers, though, are more sparsely distributed across the landscape, requiring greater travel from settlements, are limited seasonally in their desirability and ease of capture, and subject to population declines due to predation. In the Nautley River faunal assemblages, we see beaver remains being proportionately more represented prior to the fur trade. The records of Fraser Lake Post indicate declines in the numbers of beaver pelts brought to the post, and an inferred drop in the local populations of them, rather late in the 1800s. “Beaver are disappearing. Bear and marten on the increase. Other furs are said to be about the same” (HBCA 1891). The meaning of such summations and potential causes are unclear from the post reports, and they may in part reflect population cycles, as the 1895–96 report states “Beaver keeping up, marten decline, fox and lynx about the same – rabbits very scarce” (HBCA 1895–96). Based on a more comprehensive review of regional records, Hudson (1983:96–98) identifies a decline in beaver returns at several Nechako Plateau posts in 1887, including Fort St. James. He (Hudson 1983:74, 93–96) argues that the fur trade records of the broader region indicate that beaver populations were never as high as the traders had hoped, and that the late nineteenth century decline in returns was a result of many factors, including declines in human population due to disease mortality, and a corresponding drop in the numbers of hunters; mild winters shortening the hunting season; and an increase in availability of European goods and food stuffs brought by prospectors, settlers and changing trade networks. By the 1890s, he argues, some Carrier local groups’ territories were trapped out (Hudson 1983:97). But by this point Euro-Canadians had also begun to stake trap lines, resulting in a drop in stocks alarming to Indigenous hunters who had carefully monitored them for generations (Nathan n.d.). While the idea of a conservation ethic has been debated among fur trade ethnohistorians (Harkin and Lewis 2007; Krech 1987, 1999), the traditional hunting practices, including beaver trapping, of boreal forest peoples, made

extensive use of lands and selection of individuals by age, which have been shown to have been markedly different from the centralized resource extraction pattern introduced by fixed trading posts (Feit 2007:58; Furniss 2004; 212; Hamilton 1996:416–417). Harmon (2006:173) indicated these elements of a beaver hunting ethic were in practice among the Carrier as early as 1818, and were fiercely defended from outsiders, stating "they [opportunistic fur hunters from eastern Canada] do not feel the same interest, as those who permanently reside here, in keeping the stock of animals good, and therefore they make great havoc among the game, destroying alike the animals which are young and old." Clearly, Carrier hunters were acutely aware of the increasing ecological pressures being caused by a commercial fur trade (Brown 2002).

Overall, the difference in abundance of beaver in the archaeological assemblages identified here, because the chronology is crude, cannot be taken to precisely match the timing of the occurrences described in the written records, nor does the relative decrease in beaver remains recovered directly indicate a drop in the availability of beaver. Further, the complaints of fur traders about poor takes of beaver always need to be viewed critically, as they are not only subjective but may be offered as excuses to superiors, and are often couched in ethnocentric rhetoric that betrays misunderstandings and biased expectations of the priorities of Indigenous hunters, and the nature of trade partnerships (Black-Rogers 1986; White 1999). I think what is most significant about the faunal data is that beaver, and other smaller bodied fur-bearers, are important across a long span of time. In addition to ecological and economic explanations for this, it is worth considering potential social reasons for the persistence of people's focus upon such animals.

Morice (1893:94) referred to the muskrat as "the beaver of children and the poor, to whom it is known as *tse'ket.*" While this could indicate a ranking of prey by either the missionary, or his informants, it also speaks to the role of the animals in human relationships. I suspect that the phrase refers to the wide, local availability of muskrats, such that one did not need to have rights to the extensive, distant and productive hunting territories that went along with high social rank to acquire them. Access to beaver hunting territories were strictly regulated, but Hudson (1983:74) quotes Hudson's Bay Company Governor-in-Chief George Simpson as saying in 1828 that "small furs are common to all." Nor did one need to have extensive experience as a hunter-trapper. The memoirs of Carrier elder Mary John, for instance, mention being enculturated to the Traditional economy, and personally empowered by her engagement with muskrats and other small mammals on her parent's trap line in the 1920s. "Sometimes a weasel or muskrat was caught in one of their traps, and when this happened they gave the little animal to me. I watched my mother and Johnny preparing the pelts of the bigger animals, and before very long I was able to skin and stretch a pelt of my own. Soon my mother showed me how to set out a trap line around our cabin" (Moran 2007:42). The small mammals thus provided opportunity for all people to contribute to their culture.

Animals, including the seemingly small innocuous ones represented in the faunal assemblages, also marked people's relationships to one another and to the physical and social landscape over the long-term. Ethnographic literature refers to their use in names for places and persons, and as guardians and teachers, in some cases facilitated by their transformative abilities (Brown 2002:24; Furniss 2004:213). These sorts of "inter-species entanglements" (Boyd 2017) mark historical and continuing connections of people to their natural surroundings, which are increasingly recognized as vital to the maintenance and renewal of personal and cultural well-being (Kirmayer et al.

2000:613). In Wet'suwet'en and Carrier tradition, muskrat and beaver are shapers of land, essential to the formation of the world from the mud of a giant lake formed after an enormous flood (Jenness 1934:143). This positions these animals as a constant element of the worldview and in continual relationship with people. In material terms, in addition to the use of pelts in elements of dress and lodging as emblems of social position, images of animals were also social signifiers. Tattoos of animals, including beaver, marten, otter, bear, caribou, frog, birds, and fish were important, and could indicate, among other things, clan affiliation and a kind of kinship with animals (Morice 1893:209). Two fur-bearers, the bear and the beaver, continue to serve as clan emblems for the Nadleh Whut'en. Marten, ermine, and timber wolf are also listed among Carrier clan, or sub-clan, symbols (Brown 2002:30; Hall 1992:5). Kobrinsky (1982:339) likened the ontology of relationships to clan animals to being of the same flesh, which was symbolized by tattooing the flesh.

Archaeologically, the social, ideological, and historical relationships of humans and animals are most dramatically indicated on lakeside pictographs on the Nechako Plateau (Mitchell 2015; Richards 1981), including near to the Nautley River sites on Fraser Lake. Some of the rock art may be hundreds of years old, although it continued to be rendered in the 1800s (Mitchell 2015:314). Fur-bearers, including beavers, beaver lodges, otters, and more generic semi-aquatic mammals are among the images depicted. Mitchell (2015:313–314) argues that the animals - and I would add in the case of beavers, their lodges - are prominent features of the landscape, and people communicated their relationships to them, and to one another, through pictographs at important spots. Further, it is interesting to consider that the beaver, and more generic semi-aquatic animals, also physically link land and water – seen and unseen realms – as symbolized in the morals of oral narratives.

Conclusion

The mammalian fauna represented in the Nautley River sites over a millennium shows remarkable consistency in the occurrence of small and medium sized fur-bearers. Such instances have been referred to as examples of persistence, or survivance in practice and tradition (Lightfoot 2015; Panich 2013; Silliman 2014, 2016), in an effort to better acknowledge the serious pressures experienced and negotiated in colonial times than simply contrasting continuity with change. Arguably, there was some underlying persistence in the uses and meanings of these mammals, although we cannot be certain of what they were. It is apparent that people were not suddenly compelled to focus attention on these animals because of the value European traders placed upon their pelts, despite expectations that may be drawn from some fur trade scholarship.

In fact, beaver, the standard of the fur trade, are more abundantly represented in contexts well before the commercial fur trade, indicating the depth of their importance. While there is historical evidence for widespread pressures being exerted on beaver stocks by the fur trade, the timing and extent of declines in beaver returns recorded at posts on the Nechako Plateau do not neatly fit a model of over harvesting by Indigenous people, or directly indicate declines in actual populations of beavers. As Hudson (1983) argued, changes in Carrier demographics and political economy may have precipitated a decline in business at the fur trade posts during the late nineteenth century. It is not until the early twentieth century, and competition from European

trappers with different ethics and methods of harvest, that we see reference to widespread drops in the beaver populations. Even so, beaver remained among the three most abundantly represented faunal remains, along with muskrat and hare. The results of this research indicate that animals, as a source of both fur and food, were part of integrated economic strategies and cultural traditions with a long record.

A variety of ecological, social, and historical factors were undoubtedly at play in forging this situation. Salmon were a critical resource throughout the 1000 years examined here, and probably much earlier. People adapted to the seasonal availability of these fish, and longer cycles in their abundance, with storage, exchange and the use of diverse game. Among the game, large artiodactyls were used to an unknown extent, but are historically reported as being relatively few in number and difficult to predict. Optimal foraging theory might explain the importance of small mammals as a matter of prey ranking, a lack of bigger game and a need to have stable resources throughout the year when salmon runs crash. Although optimization models are flexible enough to incorporate multiple factors, including some social variables and changing historical circumstances when accounting for prey selection (Garvey and Bettinger 2014:84; Lupo 2007:167; Stiner and Kuhn 2016:178) which enhances their utility, they continue to give primacy to the general assumption that human motivations are based on calculations of costs and benefits. Such an interpretation, especially given the constancy, and seeming lack of fluctuation in use of these smaller mammals, would not fully capture the texture of the myriad relationships of humans to these animals, and the potential meanings they held, which are evident in the oral, documentary, and pictographic records, and arguably encapsulated by their abundance in the faunal assemblages over a long span of time.

Acknowledgments I wish to thank the Nadleh Whut'en Nation for permitting and facilitating this research, especially Beverly Ketlo and Chief Larry Nooski. The entire Nadleh community were generous hosts, and Irene George, Johnny George and Rita Morin were particularly gracious in allowing us access to their homes. The hard work of several Nadleh members in the field is also greatly appreciated, including Robin Heathcliff, Kailyn Ketlo, Burton Louie, Germaine Brigham, Clayton George, and especially Curtis George. Field work was supported by the MacEwan University Research Office and the Department of Anthropology field school. As always, the guidance and sharing of data, equipment and contacts by Frank Craig has been invaluable. The assistance of Deanna McAvoy with identifications and organizing the field lab is greatly appreciated, as are the comments offered on this manuscript by Beverly Ketlo. The comments and corrections suggested by the editors and peer reviewers of the *International Journal of Historical Archaeology* were also very helpful. Any remaining errors are my responsibility.

References

Ames, K. M. and Brown, T. J. (2018). Radiocarbon dating the fur trade: Bayesian analyses of fur-trade era radiocarbon dates from the Lower Columbia River. *International Journal of Historical Archaeology* online first.

Archer CRM Partnership (2008). *Archaeological Impact Assessment for the Nautley Bridge Project on Behalf of the Ministry of Transportation, Heritage Inspection Permit 2006–209*, Report on File, British Columbia Archaeology Branch, Victoria.

BCA. (1905). (British Columbia Archives, Royal British Columbia Museum) A-05022 Photograph of Fraser Lake [Nadleh Whut'en], photographer unknown

BCA. (1909). (British Columbia Archives, Royal British Columbia Museum) G-03876 Photograph of Weir in Nautley River, by Frank Swannell

BCA. (n.d.). (British Columbia Archives, Royal British Columbia Museum) D-00453 Photograph of Fort Fraser Indian Village [Nadleh Whut'en], 190-, photographer unknown

Binnema, T. and Neylan, S. (2007). Arthur Ray and the writing of Aboriginal history. In Binnema, T. and Neylan, S. eds., *New Histories for Old: Changing Perspectives on Canada's Native Pasts*. University of British Columbia Press, Vancouver, pp. 1–17.

Bird, D. W. and O'Connell, J. F. (2006). Behavioral ecology and archaeology. *Journal of Archaeological Research* **14**(2): 143–188.

Bird, D. W. and O'Connell, J. F. (2012). Behavioral ecology. In Hodder, I. ed., *Archaeological Theory Today.* Polity, Cambridge, pp. 37–61.

Bishop, C. (1980). Kwah: a Carrier chief. In Judd, C. M. and Ray, A. J. eds., *Old Trails and New Directions: Papers of the Third North American Fur Trade Conference*. University of Toronto Press, Toronto, pp. 191–204.

Bishop, C. (1987). Coast-interior exchange: the origins of stratification in northwestern North America. *Arctic Anthropology* **24**(1): 72–83.

Black-Rogers, M. (1986). Varieties of "starving": semantics and survival in the subarctic fur trade, 1750-1850. *Ethnohistory* **33**(4): 353–383.

Blood, D. A. (2000). *Mule and Black-Tailed Deer in British Columbia: Ecology, Conservation and Management*, Report to Habitat Conservation Fund. Ministry of Environment, Lands and Parks.

Booth, B. P. (2001). *Fraser Lake Important Bird Area Conservation Plan, Report to Important Bird Areas Program*, www.iba.canada.com.

Boutin, S., Moses, R., and Caley, M. J. (1988). The relationship between juvenile survival and litter size in wild muskrat (*Ondatra zibethicus*). *Journal of Animal Ecology* **57**(2): 455–462.

Boyd, B. (2017). Archaeology and human-animal relations: thinking through anthropocentricism. *Annual Review of Anthropology* **46**: 299–316.

Broughton, J. M. (1994). Declines in mammalian foraging efficiency during the Late Holocene, San Francisco Bay, California. *Journal of Anthropological Archaeology* **13**(4): 371–401.

Brown, D. (2002). Carrier Sekani self-government in context: land and resources. *Western Geography* **12**: 21–67.

Cannon, A. (1998). Contingency and agency in the growth of Northwest coast maritime economies. *Arctic Anthropology* **35**(1): 57–67.

Cannon, A., ed. (2011a). *Structured Worlds: The Archaeology of Hunter-Gatherer Thought and Action*. Equinox, Sheffield.

Cannon, A. (2011b). Introduction. In Cannon, A. ed., *Structured Worlds: The Archaeology of Hunter-Gatherer Thought and Action*. Equinox, Sheffield, pp. 1–10.

Cannon, A. (2011c). Cosmology and everyday perception in Northwest Coast production, reproduction and settlement. In Cannon, A. ed., *Structured Worlds: The Archaeology of Hunter-Gatherer Thought and Action*. Equinox, Sheffield, pp. 54–68.

Cannon, A. (2014). Historical and humanist perspectives on hunter-gatherers. In Cummings, V., Jordan, P., and Zvelebil, M. eds., *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*. Oxford University Press, Oxford, pp. 92–103.

Carlson, C. C. (2006). Indegenous historic archaeology of the 19th century Secwepemc Village at Thompson's River Post, Kamloops, British Columbia. *Canadian Journal of Archaeology* **30**(2): 193–250.

Clark, D. W. (1991). *Western Subarctic Prehistory.* Canadian Museum of Civilization, Ottawa.

Codding, B. F., Porcasi, J. F., and Jones, T. L. (2010). Explaining prehistoric variation in the abundance of large prey: a zooarchaeological analysis of deer and rabbit hunting along the Pecho coast of Central California. *Journal of Anthropological Archaeology* **29**(1): 47–61.

Cranny, M. (1986). Carrier Settlement and Subsistence in the Chinlac/Cluculz Lake Area of Central British Columbia. Unpublished Master's Thesis, University of British Columbia, Vancouver.

Donahue, P. F. (1973). Ulkatcho: an archaeological outline. *Syesis* **6**: 153–178.

Duff, W. (1951). Notes on carrier social organization. *Anthropology in British Columbia* **2**: 28–34.

Erb, J., Stenseth, N. C., and Boyce, M. S. (2000). Geographic variation in population cycles of Canadian muskrats (*Ondatra zibethicus*). *Canadian Journal of Zoology* **78**(6): 1009–1016.

Feit, H. (2007). Histories, science and rights in North American-Native American relations. In Harkin, M. E. and Lewis, D. R. eds., *Native Americans and the Environment: Perspectives on the Ecological Indian*. University of Nebraska Press, Lincoln, pp. 52–94.

Ferris, N., Harrison, R., and Wilcox, M. V. eds. (2014). *Rethinking Colonial Pasts through Archaeology.* Oxford University Press, Oxford.

Fisher, R. (1977). *Contact and Conflict: Indian-European Relations in British Columbia, 1774–1890*. University of British Columbia Press, Vancouver.

Fladmark, K. (2009). People of the rivers: an introduction to the pre-contact cultures of subarctic British Columbia. In Keenlyside, D. and Pilon, J. L. eds., *Painting the Past With a Broad Brush: Papers in Honour of James Valliere Wright,* Canadian Museum of Civilization, Hull, pp. 555–616.

Fraser, S. (2007). In Lamb, W. K. ed., *The Letters and Journals of Simon Fraser 1806-1808*. Dundurn, Toronto.

Furniss, E. (2004). The Carrier and the politics of history. In Morrison, R. B. and Wilson, C. R. eds., *Native Peoples: The Canadian Experience*. 3rd ed. Oxford University Press, Oxford, pp. 198–222.

Garvey, R. and Bettinger, R. (2014). Adaptive and ecological approaches to the study of hunter-gatherers. In Cummings, V., Jordan, P., and Zvelebil, M. eds., *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*. Oxford University Press, Oxford, pp. 78–91.

Goldman, R. (1941). The Alkatcho Carrier: historical background of crest prerogatives. *American Anthropologist* **43**(3): 396–418.

Graesch, A. P., Bernard, J., and Noah, A. C. (2010). A cross-cultural study of colonialism and Indigenous foodways in western North America. In Scheiber, L. and Mitchell, M. eds., *Across a Great Divide: Continuity and Change in Native North American Societies, 1400–1900*. University of Arizona Press, Tucson, pp. 212–238.

Greenlee, D. M. and Dunnell, R. C. (2010). Identification of fragmentary bone from the Pacific. *Journal of Archaeological Science* **37**(5): 957–970.

Hall, L. (1992). *The Carrier, My People*. Friesen, Cloverdale.

Hamilton, S. (1996). Over-hunting and local extinctions: socio-economic implications of fur trade subsistence. In Orser, C. E. ed., *Images of the Recent Past: Readings in Historical Archaeology*. Alta Mira, Walnut Creek, CA, pp. 416–436.

Harkin, M. E. and Lewis, D. R. eds. (2007). *Native Americans and the Environment: Perspectives on the Ecological Indian*. University of Nebraska Press, Lincoln.

Harmon, D. W. (2006). *Harmon's Journal 1800–1819*. TouchWood, Vancouver.

Harris C. (2007). Arthur J. Ray and the empirical opportunity. In Binnema, T. and Neylan, S. eds., *New Histories for Old: Changing Perspectives on Canada's Native Pasts*. University of British Columbia Press, Vancouver pp. 249–264.

HBCA (Hudson's Bay Company Archives). (1823). Post Journal, Fraser's Lake Post, B.74/a/1, Reel 1M54.

HBCA (Hudson's Bay Company Archives). (1824). Post Journal, Fraser's Lake Post, B.74/a/1, Reel 1M54.

HBCA (Hudson's Bay Company Archives). (1891). Post Report, Fraser Lake Post, B.74/e/1, Reel 1M1255.

HBCA (Hudson's Bay Company Archives). (1895–6). Post Report, Fraser Lake Post, B.74/e/2, Reel 1M1255.

Hodder, I. ed. (1987). *Archaeology as Long-Term History*. Cambridge University Press, Cambridge.

Holly, Jr., D. H., Prince, P., and Erwin, J. C. (2018). Bad year economics at Birchy Lake. *Journal of Anthropological Research* **74**(2): 201–231.

Hudson, D. (1983). *Traplines and Timber: Social and Economic Change among the Carrier Indians of Northern British Columbia*. Doctoral dissertation, University of Alberta, Edmonton.

Jenness, D. (1934). Myths of the Carrier Indians of British Columbia. *Journal of American Folklore* **47**(184/185): 97–257.

Jones, E. L. (2006). Prey choice, mass collecting, and the wild European rabbit (*Oryctolagus cuniculus*). *Journal of Anthropological Archaeology* **25**(3): 275–289.

Kamp, M. V., Muller, T., Tackman, K., and Loschner, U. (1998). The muskrat (*Ondatra zibethicus*) as a new reservoir for Puumal-like hantavirus strains in Europe. *Virus Research* **57**(2): 139–150.

Kirmayer, L., Brass, G., and Tait, C. (2000). The mental health of aboriginal peoples: transformations of identity and community. *Canadian Journal of Psychiatry* **45**(7): 607–616.

Kobrinsky, V. H. (1977). The Tsimshianization of the Carrier. In Helmer, J. ed., *The Athapaskan Question: Prehistory of the North American Sub-Arctic*. University of Calgary Archaeological Association, Calgary, pp. 201–210.

Kobrinsky, V. H. (1982). On thinking of eating animals: dialectics of Carrier social identity symbols. *Dialectical Anthropology* **6**(4): 337–344.

Krebs, C. J., Boonstra, R., Boutin, S., and Sinclair, A. R. E. (2001). What drives the 10 year cycle of snowshoe hares? *BioScience* **51**(1): 25–35.

Krech, S. ed. (1987). *Indians, Animals and the Fur Trade: A Critique of Keepers of the Game*. University of Georgia Press, Athens.

Krech, S. (1984a). Introduction. In Krech, S. ed., *The Subarctic Fur Trade: Native Social and Economic Adaptations*. University of British Columbia Press, Vancouver, pp. 10–21.

Krech, S. (1984b). The trade of the Slavey and Dog Rib at Fort Simpson in the early nineteenth century. In Krech, S. ed., *The Subarctic Fur Trade: Native Social and Economic Adaptations*. University of British Columbia Press, Vancouver, pp. 99–146.

Krech, S. (1999). *The Ecological Indian: Myth and History*. W.W. Norton, New York.

Lightfoot, K. G. (1995). Culture contact studies: redefining the relationship between prehistoric and historical archaeology. *American Antiquity* **60**(2): 199–217.

Lightfoot, K. G. (2013). Rethinking the archaeology of human-environmental interactions in deep time history. In Schmidt, P. R. and Mrozowski, S. A. eds., *The Death of Prehistory*. Oxford University Press, Oxford, pp. 183–200.

Lightfoot, K. G. (2015). Dynamics of change in multiethnic societies: an archaeological perspective from colonial North America. *Proceeding of the National Academy of Sciences of the United States of America* **112**(30): 9216–9223.

Lupo, K. D. (2007). Evolutionary foraging models in zooarchaeological analysis: recent applications and future challenges. *Journal of Archaeological Research* **15**(2): 143–189.

Lupo, K. D. and Schmitt, D. N. (2002). Upper Paleolithic net-hunting, small prey exploitation, and women's work effort: a view from the ethnographic and ethnoarchaeological record of the Congo Basin. *Journal of Archaeological Method and Theory* **9**(2): 147–179.

Magne, M. and Matson, R. G. (2008). Projectile points of central and northern interior British Columbia. In Carlson, R. L. and Magne, M. eds., *Projectile Point Sequences in Northwestern North America*. Simon Fraser University Archaeology Press, Burnaby, pp. 273–292.

Martin, C. (1978). *Keepers of the Game: Indian-Animal Relationships and the Fur Trade*. University of California Press, Berkeley.

Martin, C. (1987). Comment. In Krech, S. ed., *Indians, Animals and the Fur Trade: A Critique of Keepers of the Game*. University of Georgia Press, Athens, pp. 189–197.

Martindale, A. (2018). The future of history in archaeology. *Canadian Journal of Archaeology* **42**(1): 154–164.

McLean, J. (1849). *Notes of a Twenty-Five Years' Service in the Hudson's Bay Territory, Volume 1*. Richard Bentley, London.

Mitchell, S. (2015). *At the Water's Edge: An Integration of Ethnographic and Archaeological Methods in the Study of Rock Art in Northern Central British Columbia, Canada*. Doctoral dissertation, University of Leicester, Leicester.

Moran, B. (2007). *Stoney Creek Woman: The Story of Mary John*. Arsenal Pulp Press, Vancouver.

Morice, A. G. (1889). The Western Dénés, their manners and customs. *Proceedings of the Canadian Institute* **26**(52): 109–174.

Morice, A. G. (1893). *Notes Archaeological, Industrial and Sociological on the Western Denes with an Ethnographical Sketch of the Same*. Transactions of the Canadian Institute, Volume IV, Toronto.

Murphy, R. F. and Steward, J. H. (1956). Tappers and trappers: parallel process in acculturation. *Economic Development and Cultural Change* **4**(4): 335–355.

Nassaney, M. S. (2015). *The Archaeology of the North American Fur Trade*. University of Florida Press, Gainesville.

Nathan, H. (n.d.). "Much Harm Has Been Done" - a Regional Culture History of the Nak'azdli Band and Saik'uz and Nadleh Whut'en First Nations in a Changing and Industrializing Landscape. Unpublished Report on File with the Nadleh Whut'en Band, Fort Fraser.

Oland, M., Hart, S. M., and Frink, L. eds. (2012). *Decolonizing Indigenous Histories: Exploring Prehistoric/ Colonial Transitions in Archaeology*. University of Arizona Press, Tucson.

Panich, L. M. (2013). Archaeologies of persistence: reconsidering the legacies of colonialism in native North America. *American Antiquity* **78**(1): 105–122.

Pauketat, T. R. (2001). Practice and history in archaeology. *Anthropological Theory* **1**(1): 73–98.

Prince, P. (2011). Riverine Salmon harvesting and processing technology in northern British Columbia. In Cannon, A. and Moss, M. eds., *The Archaeology of North Pacific Fisheries*, University of Alaska Press, Fairbanks, pp. 148–180.

Prince, P. (2014). Fish weirs and an interior salmon fishery on the Nautley River, Central British Columbia. *North American Archaeologist* **35**(2): 119–148.

Rahemtulla, F. (2012). *Archaeological Research Investigations at Site GiSq-004 Located at Nilitkwa Lake in the North-Central Interior of BC*, Report on File with the British Columbia Archaeology. Branch, Victoria.

Ray, A. J. (1984). Periodic shortages, Native welfare, and the Hudson's Bay Company, 1670-1930. In Krech, S. ed., *The Subarctic Fur Trade: Native Social and Economic Adaptations*. University of British Columbia Press, Vancouver, pp. 22–41.

Ray, A. J. (1998). *Indians in the Fur Trade: Their Role as Trappers, Hunters and Middlemen in the Lands Southwest of Hudson's Bay, 1660–1870*. University of Toronto Press, Toronto.

Richards, T. (1981). A pictograph survey of southeast Stuart Lake. In Simonsen, B., Kenny, R., McMurdo, J., and Rafferty, P. eds., *Annual Research Report No. 1: Activities of the Heritage Conservation Branch for the Year* 1978. Government of British Columbia, Victoria, pp. 133–166.

Ricker, W. E. (1997). Cycles of abundance among Fraser River sockeye salmon (*Oncorhynchus nerka*). *Canadian Journal of Fisheries and Aquatic Science* **54**(4): 950–968.

Rousseau, M. (2008). Chipped stone bifaces as cultural, behavioural, and temporal indices on the central Canadian Plateau. In Carlson, R. L. and Magne, M. eds., *Projectile Point Sequences in Northwestern North America*. Simon Fraser University Archaeology Press, Burnaby, pp. 221–250.

Rubertone, P. E. (2000). The historical archaeology of Native Americans. *Annual Review of Anthropology* **29**: 425–446.

Rudland, L. (1988). *Fort Fraser (Where the Hell's That?)*. D.W. Friesen, Cloverdale.

Russell, N. (2012). *Social Zooarchaeology: Humans and Animals in Prehistory*. Cambridge University Press, Cambridge.

Santomauro, D., Johnson, C. J., and Fondahl, G. (2012). Historical-ecological evaluation of the long-term distribution of woodland caribou and moose in Central British Columbia. *Ecosphere* **3**(5): 1–19.

Sassaman, K. E. and Holly, Jr., D. H. eds. (2011). *Hunter-Gatherer Archaeology as Historical Process*. University of Arizona Press, Tucson.

Sassaman, K. E. and Randall, A. R. (2012). Hunter-gatherer theory in North American archaeology. In Pauketat, T. R. ed., *North American Archaeology*. Oxford University Press, Oxford, pp. 18–27.

Scheiber, L. and Mitchell, M. eds. (2010). *Across a Great Divide: Continuity and Change in Native North American Societies, 1400–1900*. University of Arizona Press, Tucson.

Schmidt, P. R. and Mrozowski, S. A. (2013). The death of prehistory: reforming the past, looking to the future. In Schmidt, P. R. and Mrozowski, S. A. eds., *The Death of Prehistory*. Oxford University Press, Oxford, pp. 1–30.

Silliman, S. W. (2009). Change and continuity, practice and memory: Native American persistence in colonial New England. *American Antiquity* **74**(2): 211–230.

Silliman, S. W. (2010). Crossing, bridging and transgressing divides in the study of Native North America. In Scheiber, L. and Mitchell, M. eds., *Across a Great Divide: Continuity and Change in Native North American Societies, 1400–1900*. University of Arizona Press, Tucson, pp. 258–276.

Silliman, S. W. (2014). Archaeologies of Indigenous survivance and residence: navigating colonial and scholarly dualities. In Ferris, N., Harrison, R., and Wilcox, M. V. eds., *Rethinking Colonial Pasts through Archaeology*. Oxford University Press, Oxford, pp. 57–75.

Silliman, S. W. (2016). Disentangling the archaeology of colonialism and indigeneity. In Der, L. and Fernandini, F. eds., *Archaeology of Entanglement*. Routledge, London, pp. 31–48.

Steward, J. H. (1941). Determinism in primitive society. *Scientific Monthly* **53**(6): 491–501.

Steward, J. H. (1977). Carrier acculturation: the Direct Historical Approach. In Murphy, R. F. and Steward, J. H. eds., *Evolution and Ecology: Essays on Social Transformation*. University of Illinois Press, Urbana, pp. 188–200.

Stiner, M. C. and Kuhn, S. L. (2016). Are we missing the "sweet spot" between optimality theory and niche construction theory? *Journal of Anthropological Archaeology* **44**(B): 177–184.

Stiner, M. C. and Munro, N. D. (2002). Approaches to prehistoric diet breadth, demography and prey ranking systems in time and space. *Journal of Archaeological Method and Theory* **9**(2): 181–214.

Tobey, M. (1981). Carrier. In Helm, J. ed., *Handbook of North American Indians. Vol. 6. Subarctic*, Smithsonian Institution, Washington, DC, pp. 413–432.

Traces Archaeological Research and Consulting (2003). *Nadleh Whut'en Fish Weir Project*, Report on File with the Nadleh. Whut'en Band, Fort Fraser.

Trigger, B. G. (1986). *Natives and Newcomers: Canada's "Heroic Age" Reconsidered*. McGill-Queen's University Press, Kingston.

Ugan, A. (2005). Does size matter? body size, mass collecting, and their implications for understanding prehistoric foraging behavior. *American Antiquity* **70**(1): 75–89.

White, B. M. (1999). The woman who married a beaver: Trade patterns and gender roles in the Ojibwa fur trade. *Ethnohistory* **46**(1): 109–147.

Williams-Larson, A. (2017). Faunal remains and artifacts from the Fur Trade Period occupation at Housepit 54. In Prentiss, A. M. ed., *The Last House at Bridge River: The Archaeology of an Aboriginal Household in British Columbia during the Fur Trade Period*, University of Utah Press, Salt Lake City, pp. 125–149.