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## RESEARCH ARTICLE

# Military supply, everyday demand, and reindeer: Zooarchaeology of Nazi German Second World War military presence in Finnish Lapland, Northernmost Europe

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## Abstract

During the Second World War, in 1941–1944, Nazi German troops held the frontal responsibility of the Arctic front in Finnish Lapland. In this paper, we present the first zooarchaeological study of the wartime faunal remains from German military camps in Lapland. This illustrates the supply situation of both the German soldiers and their multinational prisoners. The official military supply was substantially supplemented with local food sources, namely, with the local semi-domesticated reindeer that dominates the bone assemblage. Bones of cattle, ovicaprines, and pig occur in lower numbers and appear to represent the German long-distance supply chain stretching from the Mediterranean to the Arctic Ocean. The remains of reindeer and wild species remind of the close interactions with locals and of the prisoners' hunting activities to supplement their meager diet. Even if the reindeer bones dominate both the soldiers' and prisoners' faunal assemblages, there are notable differences in the body parts, with bones from meatier portions always found in the soldiers' food waste. Besides highlighting a tension between the military supply and everyday demands, the faunal remains can draw attention to wider anthropological questions that reach beyond the information available in historical documents, such as adaptations into an alien northern environment. This emphasizes the importance of zooarchaeological analyses of recent past faunal materials from superficially familiar contexts.

## KEYWORDS

Finland, Lapland, military supply, Nazi Germany, reindeer, Sámi, Second World War, zooarchaeology

## 1 | INTRODUCTION

During the Second World War in 1941–1944, Nazi German troops held the military responsibility of the long Arctic front in Finnish Lapland (Figure 1). Germans came to the North as Finnish allies to join a common fight against the Soviet Union. However, the war in the

North ended with Finns and Germans as enemies in the Lapland War in 1944–1945, which caused widespread destruction in northern Finland. Because the Germans also destroyed part of their archives during their retreat from Finland in 1944, the documentary evidence is patchy and remains little studied (but see Lundemo, 2020; Westerlund, 2008). Thus, the archaeological and anthropological

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**FIGURE 1** (a) Arctic front in 1941–1944, the studied sites in Finnish Lapland (1–9, numbers refer to Tables 1 and 2), and the German-run PoW camp at Sværholt, Norway (10). (b) View of the German military camp at Enontekiö Mallajoki in May 2021. Map and photograph Oula Seitsonen 2021 [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1002/oa.3039)]

approaches to the material and immaterial heritage hold a high potential for studying the wartime in the North, especially in the remote wilderness areas (Seitsonen, 2020).

Archaeological research of the 20th century conflicts is a globally growing subfield of archaeology (e.g., Figenschau, 2019; Olsen & Witmore, 2014; Theune, 2018). In this paper, we present the analyses of the faunal remains uncovered during our archaeological studies of German Second World War (WWII) encampments in the Arctic front in 2006–2020 (Banks et al., 2018; Seitsonen, 2020; Seitsonen et al., 2017). On the basis of these, we review what is currently known of the German military supply and subsistence in Finnish Lapland. The surviving archival information of the German food supply situation in northern Finland is limited, and little has been published by historians (Lundemo, 2020; Pranttila, 2006; Westerlund, 2008). Indications of the military supply can be found, for instance, in the German shipping

lists and some other documents. These historical documents (Lundemo, 2020; Pranttila, 2006) as well as the transgenerational memories collected by us (e.g., Seitsonen & Koskinen-Koivisto, 2018) supplement the excavation finds. Finnish Lapland is part of the transnational Sápmi, the homeland of Europe's only indigenous people Sámi, and therefore, the Sámi placenames are given in the parentheses. This connection is also mirrored in the composition of faunal material, as the semi-domesticated reindeer herded by the Sámi are strongly present in the assemblage.

The zooarchaeological finds from WWII sites have not been previously studied in Finland (Seitsonen, 2020, pp. 143–146). The only comparable faunal analysis comes from a German-run Prisoner-of-War (PoW) camp at Sværholt in northernmost Norway (Figure 1: 10; Grabowski et al., 2014; Olsen & Witmore, 2014; see Eryvnc et al., 2018, for a First World War case study). Besides providing novel

information of the supply and maintenance of the Nazi German troops and their multinational prisoners and forced civilian laborers, our study highlights also wider anthropological questions of dislocation and adaptation to an alien northern landscape. Northern front was an extremely unfamiliar environment for the Germans, which effectively stalled their advance in the Arctic.

## 2 | GERMAN TROOPS IN AN ARCTIC WILDERNESS

Finland and Nazi Germany were co-belligerents in 1941–1944 in the fight against the Soviet Union (USSR). This stemmed from the Finno-Russian Winter War of 1939–1940, which ended up with Finland losing vast stretches of land and vital resources. In the political situation of Europe in 1940, Finland assumed that a new war with USSR was waiting to happen and joined forces with Nazi Germany (e.g., Ahto, 1980). German troops entered Finland in 1940 during the preparations for Operation Barbarossa, Hitler's attack to Soviet Union. When the offensive was launched in 1941, Finland joined in the battle to regain the losses of Winter War and to pursue a "Greater Finland" (e.g., Kivimäki, 2012). However, the Arctic front became soon stationary, as the German troops were ill-prepared for the difficult northern conditions. For instance, there were few roads, and the existing ones had a very limited carrying capacity (Lundemo, 2020; Seitsonen & Lundemo, 2021). Owing to the poor infrastructure, large numbers of the German troops and their multinational prisoners in Lapland became bogged down in vast infrastructural projects, building roads, railroads, and bridges and improving existing structures (Korpi, 2010; Seitsonen et al., 2017). Stemming from this lack of infrastructure, the German troops constantly struggled in the supply and maintenance of their troops in the North. As an extreme example, the supply of remote outposts in Petsamo (Skolt Sámi: *Peäccam*) on the Arctic Ocean coast relied on men and draught animals, such as reindeer and imported mules, and later also on German-built cableways (Lundemo, 2020, pp. 127, 137; Westerlund, 2008, pp. 49, 115).

At the height of their military built-up, Germans had over 200,000 soldiers and about 30,000 multinational prisoners and forced laborers in this sparsely populated northern fringe of Finland with less than 150,000 local inhabitants (Seitsonen, 2020; Westerlund, 2008). The Germans seized on the northern front about 9000 Soviet PoWs, which was not enough workforce for their infrastructural and maintenance projects, and therefore about 20,000 laborers were imported from the German-occupied countries to Finland, for example, from Poland, French, Belgium, Netherlands, Croatia, and Serbia (Lundemo, 2020, p. 195; T-17215/1, 1942; T-5471/11, 1943; Westerlund, 2008). As an example, based on the local memories and archaeological studies, Inari Hyljelahti camp (Inari Sámi: *Nuárjuluhtâ*) did not accommodate Soviet PoWs, but (forced) laborers of the Nazi work organization *Organisation Todt* (OT), at least from Norway, employed in forestry and road maintenance (Seitsonen, 2020).

Prisoner food supplies were generally insufficient, and the poorly clothed and starved prisoners were used throughout the year in heavy

physical labor in the harsh Arctic conditions (Lundemo, 2020, p. 200). This took a heavy toll on the prisoners, with a death rate of over 20% (Westerlund, 2008). For example, in 1942, German officer Prinz von Hessen noted in his report that "exhausted prisoners—could only move by crawling" (Lundemo, 2020, p. 192). The poor conditions are also remembered in the local memories that have been collected for example from Inari Haukkapesäoja (Northern Sámi: *Fällebeasjohka*): "—it took three prisoners to bring one iron bar to the smithy—" (Matti Alensanteri Kiviniemi, in Arvelin, 2009, p. 45). However, at certain forestry sites, including Haukkapesäoja, the Finnish and Sámi workmen employed alongside PoWs were allowed to feed them from their own supplies to get them into a better working condition.

Native Sámi and Finns lived for several years as neighbors of the German troops and their prisoners, and close relationships were forged between them. This offered also thriving business opportunities for locals who, for instance, rented land and houses for Germans, worked in the German-run infrastructural projects, and supplemented the German troops with the local wilderness products (Airio, 2014, p. 251; Junila, 2000; Lundemo, 2020; Seitsonen, 2020). This close interaction is actively remembered by locals, as recapped in the interviews we have carried out alongside the excavations (Seitsonen, 2020: Appendix 1). Often these recollections have become embedded into the transgenerational communal memories, and the overgrown material remains act as dynamic agents of these remembrances (Seitsonen, 2017; Seitsonen & Koskinen-Koivisto, 2018). Many aspects of the local stories about interaction with the Germans and their prisoners are mirrored also by the analyzed faunal material, as we discuss below.

Supplying the German troops in Lapland was a colossal task due to the extreme restrictions of the northern infrastructure (Lundemo, 2020, p. 135). Massive amounts of foodstuff and other material were shipped to Finland throughout the war (Lundemo, 2020, p. 242), for example, 7420 living cows were imported in 1942 by Germans on cargo vessels to support their own and Finnish troops (Pranttila, 2006, p. 62). The local memories and archival information show that Germans transported meat to the Arctic front at least as salted, smoked, and frozen (Pranttila, 2006, pp. 60–61). Transporting frozen meat was of course easiest during the long winter months, when the temperatures in the North are constantly below freezing. According to war historian Pentti Airio (2014, p. 206), the Germans also had some refrigerator vehicles in Finland, some of which operated from a German supply center situated in the outwardly neutral Sweden in Luleå (Westerlund, 2008, p. 292). Numerous private enterprises from different countries, including logistical and other companies from Finland and Sweden, took part in supplying the German war efforts (Lundemo, 2020; Westerlund, 2008, p. 292). This period is illustratively remembered as the time of "Petsamo traffic" in northern Sweden, referring to the large-scale trucking of goods to the northernmost Petsamo front (Björklund, 1981).

Owing to the poor infrastructure, the supply organization on the northern front depended heavily on draught animals. Horse drawn carts, sledges, and pack animals were vitally important for the German, Finnish, and Soviet logistical organizations (e.g., Aikavuori &

Kulju, 2017; Leinonen, 2013; Lundemo, 2020, p. 136; RH2020-190, 1941; Tourunen & Nygren, 2011). German troops brought with them tens of thousands of horses and mules to Finland, up to 60,000 in 1941, compared with their about 25,000 motorized vehicles (Westerlund, 2008, p. 49). However, by the fall 1944, this number had dwindled down to about 32,000 animals owing to the hardships encountered in the Arctic environment (Westerlund, 2008, p. 49). Mules were, for example, brought to the Arctic by Germans from Greece, and large numbers of them perished already in the first winter 1941–1942 (Westerlund, 2008, p. 49).

On the Arctic front, all warring sides relied also on reindeer transportation. For the Germans, this was provided by the expert Sámi and Finnish reindeer handlers (Figure 2; Lundemo, 2020, pp. 101, 137). There is at least one receipt in the archives showing that the Germans occasionally bought the draught reindeer, sledges, and harnesses from the Finns (T-17944/50, 1942). To begin with in 1941, when Germans arrived in Lapland, there were numerous incidents of shooting free-ranging reindeer for food. This was repeatedly forbidden in the standing orders of the German troops: “Reindeer is a domestic animal like cattle in Germany” (Junila, 2000, p. 140; also Lundemo, 2020, p. 61; RH2020-224, 1942). This is the side of the German-reindeer relations that is highlighted in the historical documents, such as Finnish crime investigation reports (Mikkonen, 2017, pp. 53–55). In contrast, the local recollections that we have collected emphasize the mutually beneficial relationship between locals and the German troops, including the unofficial bartering of reindeer and other wilderness products, often for alcohol. The purchasing of groceries, including eggs and milk, from the northern Finnish civilian population was officially forbidden from 1941 to preserve their food supply (Fb110-8, 1941; Lundemo, 2020, p. 246). However, our archaeological studies and ethnographic interviews suggest that on the local level, this order was widely disregarded (see below).

The Finnish–German cooperation came to an end in fall 1944, when Finland was forced into a ceasefire after a major Soviet attack in the south. USSR demanded that Finns drive their German allies out of the country on an unrealistic schedule, and hostilities were expected in the Arctic front. On the local level, the Finno-German cooperation continued even after the ceasefire, and the Finnish and German troops evacuated together most of Lapland's civilians on a swift schedule from the expected warzone, transporting them to Ostrobothnia in Western Finland and to Swedish refugee camps (Lehtola, 1994; Seitsonen, 2020). Throughout the late-September 1944, Finns and Germans played mock war. However, Soviet pressure soon turned this conflict real, and the German scorched earth tactics resulted in widespread demolition of Lapland's public and private infrastructure and property. Upon their return, most of the evacuees found their homes in ashes and had to rebuild their lives from the scratch among the ruins littered with landmines. The German-laid explosives injured and took lives of numerous locals and their reindeer in the postwar years, and unexploded ordnance is still yearly encountered.

### 3 | ZOOARCHAEOLOGICAL MATERIAL FROM LAPLAND'S SECOND WORLD WAR MILITARY SITES

During our conflict archaeological fieldwork in Lapland in 2006–2020, we have collected zooarchaeological material from nine German WWII sites (Table 1). Most of the studied sites are German-run PoW and labor camps, except Enontekiö Mallajoki military camp (Northern Sámi: *Eanodat Mallajohka*) (Figure 1) and Inari Military Hospital site (Figure 3).

Most of the sites are small, and compact camps situated at remote and isolated locations, where prisoners were employed in



**FIGURE 2** Original caption: “In the wilderness of faraway Lapland also the Germans use reindeer transportation that is offered by the Finnish troops.” Notice the skis and ski poles leaning against the tree. Photograph SA-kuva 82140/Petsamo,Suonikylä-Lutto,Lounakoski/April 13, 1942

**TABLE 1** Analyzed faunal assemblage and contexts (NSP)

Site	Finnish name	Sámi name	Site function	Context	Study type	Soldiers	Prisoners	Total
1	Enontekiö Mallajoki	Eanodat Mallajohka	Military camp	Rubbish dump	Surface sample	58		58
2	Inari Hyljelahti	Aanaar	Nuárjuluohtá	Labor camp	2 rubbish pits (fully excavated)	78		78
3	Inari Iso Pihtijärvi	Aanaar Postjävri	Saw mill/labor camp	Rubbish pit (partly excavated)	Excavation	71		71
4	Inari Kankiniemi	Aanaar Kaŋgânjargá	Prisoner of war/labor camp	2 rubbish pits (partly excavated)	Excavation	77	60	137
5	Inari military hospital	-	Military hospital	Rubbish pit & building foundation (partly excavated)	Excavation	76		76
6	Inari Joutavalahki	Aanaar	Jyevdiläsluohtá	Prisoner of war/punishment camp	Rubbish dump	Surface	sample	
42	42							
7	Inari Peltojoki	Anár Bealdojohka	Prisoner of war/labor camp	2 rubbish pits & 2 building foundations (partly excavated)	Excavation	15		15
8	Inari war/labor camp	2 rubbish dumps & rubbish pit	Haukkapesäoja	Anár Fállebeasjohka	Prisoner of Surface sample	49	52	101
9	Sodankylä Purnumukka	Soadegilli	Burdnomohkki	Prisoner of war/labor camp	Rubbish dump	Surface	sample	
28	28							
Total						424	182	606

Note: NSP = Number of Specimens.

**FIGURE 3** Most of the northern Second World War military camps are today inconspicuous and overgrown: a former German road, now a narrow footpath, running among the ruins of the German Military Hospital in Inari. Photograph Oula Seitsonen 2015 [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



forestry and road building, except the Inari Military Hospital, which is right next to Inari village (Northern Sámi: *Anár*; Inari Sámi: *Aanaar*). This was a well-supplied German field hospital, where also Inari

villagers were treated by the German doctors (Banks et al., 2018). The studied contexts were selected based on their reliable connection to either German soldiers or prisoners based on the spatial configuration

of the camps. The boundaries of prisoner areas are typically discernible, for instance, by stumps of fence posts, fallen and overgrown barbed wire, and other structures. At the studied sites, the guards and prisoners had their own kitchens in their restricted portions of the camps, with rubbish pits placed next to them (Figure 4). Only two rubbish pits have so far been fully excavated. The rest of the bones derive from partial excavations and surface samples from larger rubbish pits and dumps, which might skew their representativeness. The excavated soil was screened with 6-mm sieves. Two thirds of the bones were recovered from German soldier-related contexts, perhaps indicating the distribution of meat between the guards and their prisoners (Table 1).

The preservation condition of the assemblage tends towards moderate. Altogether, 51% of the bones were identified to the species level and further 31% to size and class (Table 2). The collected faunal assemblage is heavily dominated by the local semi-domesticated reindeer (70% of bones identified to species) herded in the area for centuries by both Sámi and Finns. This is a highly interesting and significant finding, as the supplying of German troops and their prisoners with reindeer is absent from the historical documents, beyond the illegal shootings and selling of draught animals (Junila, 2000; Lundemo, 2020).

The next most common species *Bos taurus taurus* trails far behind (15.2%), and the other domesticates are present in low numbers, including *Equus caballus* (horse) (2.9%), *Sus scrofa domesticus* (pig) (2.6%), and *Ovis aries/Capra hircus* (ovicaprine) (1.3%) (Table 2). Besides these, several bones of *Lepus timidus* (hare), one fish bone (a Gadidae cleithrum), one juvenile galliform humerus, five bones of *Lagopus lagopus* (ptarmigan), and some *Alces alces* (elk) remains were found. Bones of large mammals ( $N = 107$ ) can originate from either cattle, horse, mules, or elk. Notable is that most of the bones of large mammals originate from soldier-related context, as also all the torso

bones of medium mammals ( $N = 11$ ), namely, ribs that based on their size, can be from reindeer.

The specimens are mostly either very small or very large (Figure 5). Based on the good preservation of both large and small bones, it seems likely that, for example, the abundance of phalanxes in the assemblage does not result from preservation-related issues. The smaller specimens are consistently found in the PoW-related contexts, likely telling of the kind of supplies provided to or acquired by them. These are mostly fragments of reindeer bones that have a high percentage of breakage and appear to illustrate the thorough utilization of meat, bones, marrow, and everything else by the prisoners. Then again, the large specimens originate mostly from the soldier-related contexts and have a low incidence of breakage and an abundance of complete specimens. Even those that are not complete are characteristically industrially butchered large specimens of *B. taurus taurus* (domestic cattle), such as halved vertebra and pelvic bones (Figure 6). The differential treatment of bones of different species is well-illustrated by the Fracture Freshness Index (FFI), recorded for all the countable specimens following the criteria laid out by Outram (2002). Reindeer remains have low FFI values and suggest fresh fracturing, perhaps to extract bone marrow, whereas the cattle bones have consistently higher FFI values and appear to have been fractured by postdepositional processes (Figure 6).

### 3.1 | *Rangifer tarandus*

Both soldiers' and prisoners' bone assemblages are dominated by the indigenous reindeer herded by Sámi herders and Finnish settlers for centuries (e.g., Seitsonen & Viljanmaa, 2021; Turunen et al., 2018). Over 80% of identified bones from the prisoner contexts originate from reindeer and over 60% in the soldiers' deposits. Reindeer



**FIGURE 4** A typical Second World War German soldiers' rubbish pit with cattle bones, tins, and alcohol bottle sherds at the Inari Hyljelahti labor camp. Photograph Oula Seitsonen 2016 [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

TABLE 2 Identified specimens by site and context (NISP)

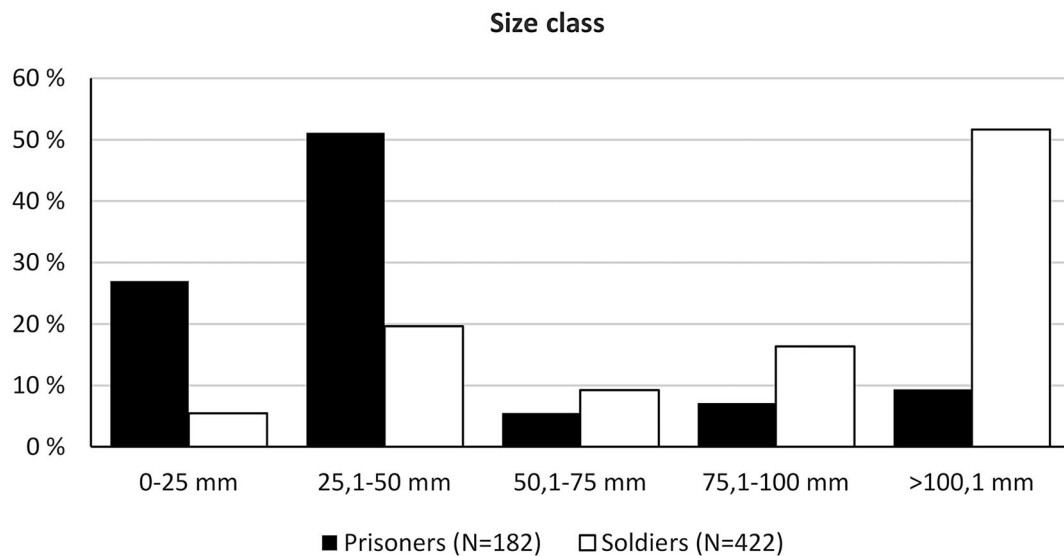
Site	<i>Rangifer tarandus</i>			<i>Bos taurus taurus</i>			<i>Equus caballus</i>		
	Upper limb	Lower limb	Torso	Upper limb	Lower limb	Head	Upper limb	Lower limb	Torso
Soldiers									
1	9	43	3	4	2	1	1	1	1
2	17	1		2			1	1	
3	3			6	4	1	1	2	1
4	3	1		1					
5				12	5	9		1	
7	5		1						
8	10	29							
Total soldiers	47	73	4	25	11	10	1	2	5
Prisoners									
4	1	3		1	1			1	
6	4	31	1						
8	5	21							
9		24							
Total prisoners	10	79	1	1	1			1	9
Grand total	218			48					

TABLE 2 Continued

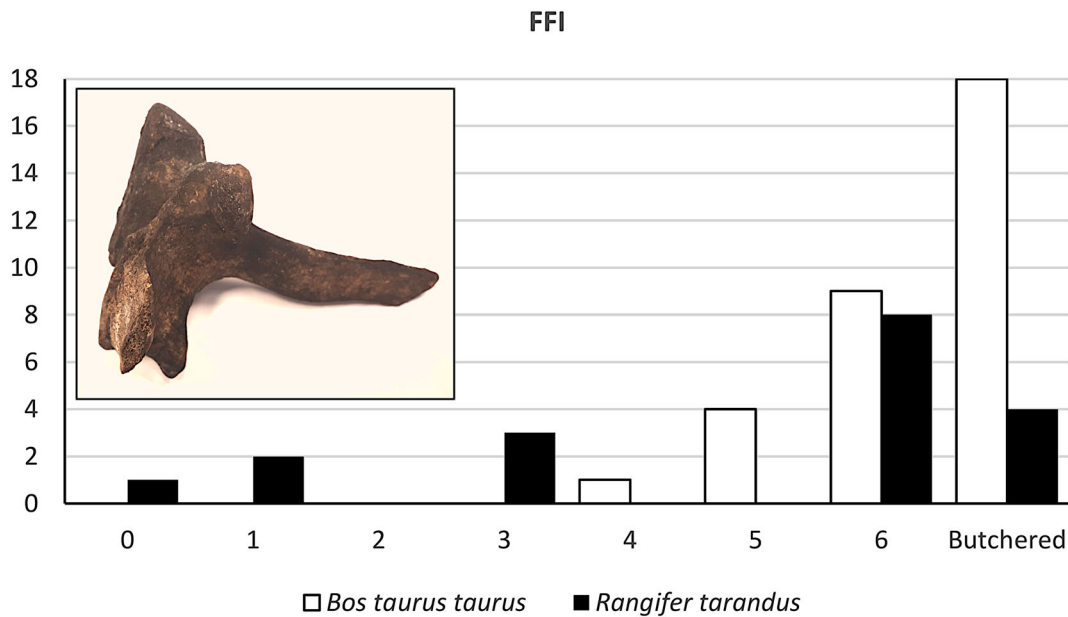
Site	<i>Sus scrofa domesticus</i>			<i>Ovis aries/Capra hircus</i>			<i>Alces alces</i>			<i>Lepus timidus</i>		
	Upper limb	Lower limb	Torso	Upper limb	Lower limb	Head	Upper limb	Lower limb	Head	Upper limb	Lower limb	Torso
Soldiers												
1			3				3					2
2												
3	3				1							
4												
5			1									
7						1						
8												
Total soldiers	3		4	1	1	1	3		2			
Prisoners												
4		1										
6												
8										7	3	2
9												
Total prisoners	1			1						7	3	2
Grand total	8		4	5		12						







**FIGURE 5** Size class of the faunal remains



**FIGURE 6** Fracture Freshness Index (FFI) of the cattle and reindeer bones. Inset: a cow vertebra sawed in half, found among the soldiers' food waste at Enontekiö Mallajoki. Photograph Oula Seitsonen 2017 [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

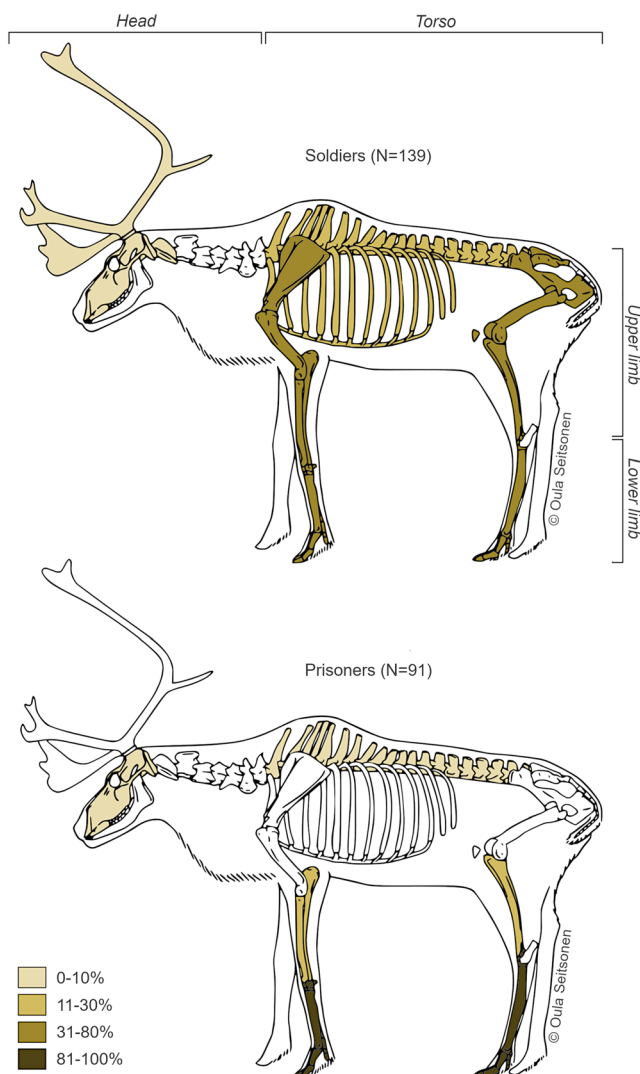
remains were encountered at all sites except Inari Military Hospital. Some of the reindeer bones might relate to the illegal shootings as recorded in the historical documents (Junila, 2000; Lundemo, 2020). However, the relative abundance and characteristics of these bones, and the local transgenerational memories, suggest that majority of them originate from the close encounters and unofficial bartering between the German troops and locals.

The local Sámi that we have interviewed often recap how their parents and grandparents sold reindeer to German troops and also slaughtered and skinned the animals for them. Of special interest are the long bones cracked for extracting bone marrow in a typical Sámi

way, as pointed out to us by Sámi herders visiting our excavations. Marrow (Northern Sámi: *ada*) is a local delicacy, and the Sámi agency in this matter seems to be the most likely explanation for cracking the bones to extract it. Contrasting with this personal treatment of reindeer, local memories about selling sheep emphasize that Germans simply took the animals with them and slaughtered those themselves. The special care that the reindeer appear to have gotten from the herders likely mirrors its central place in the local culture and the vital importance of human-reindeer relations.

There are significant contextual differences in the composition of the reindeer body parts. The meatier portions, represented by the

torso and upper limb bones, are predominantly found among the soldiers' food waste, whereas the prisoners' food waste consists of the leaner parts, represented by the lower limb bones such as phalanges and metapodials (Table 2; Figure 7). Still, the lower limb elements are commonly found also in the soldiers' mixed waste deposits. Reindeer phalanges have been used as gaming pieces by the Sámi, but this seems like an unlikely explanation for their abundance in the German deposits. In the traditional way, the reindeer was skinned so that the phalanges and metapodials were left in the skin. If the local herders slaughtered and skinned the reindeer, they likely took the skins away to use them in the traditional Sámi handicrafts, such as manufacturing everyday clothing and other items. For example, the skin from the lower limbs was traditionally used for manufacturing reindeer skin shoes (Northern Sámi: *Nuvttohat*). Germans often bought products such as warm reindeer skin clothes and sleeping bags



**FIGURE 7** Reindeer body parts in the soldier and prisoner contexts (see Table 2; soldiers' assemblage includes 11 torso bones and 1 upper limb bone from medium mammals that based on their size might originate from reindeer) [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

from the locals to supplement their own, in the Arctic often deficient, military-issued materials, and also as souvenirs (Figure 8) (Airio, 2014, p. 216; Turunen et al., 2018).

One possible explanation for the high number of lower limb bones in the assemblage is that the initial working of the skinned hides, at least the removal of bones from the skins, took place at the German sites immediately after the slaughter. This was most probably done by the Sámi herders who sold the animals. Based on the excavation observations, the removed lower limb bones were typically dumped among the soldiers' mixed waste, instead of the deposits meant for the soldiers' food waste situated next to the kitchen areas, which include the bones from the meatier parts. The phalanges and metapodials might indicate that there was also a need, perhaps seasonally or at remote sites, to use the less meaty parts of reindeer in cooking, or this could represent attempts to provide variety to the canned foods as reindeer has its own explicit taste. For example, reindeer stew was served to Albert Speer, the leader of OT and Hitler's Minister of Armaments and War Production, as an exotic delicacy when he visited OT worksites in Inari in the winter 1943 (T-17217/1, 1944).

In contrast, the reindeer lower limb bones uncovered from the prisoner contexts likely illustrate a real, urgent need to cook even the leanest leftover scraps of meat. These might have been scavenged from the skinning waste, which was dumped in the guards' mixed waste deposits by the Sámi herders after handling the carcasses.

### 3.2 | *Bos taurus taurus*

All the recovered cattle bones originate from large-sized animals. This is interesting, because the indigenous Northern Finncattle, commonly known in the local vernacular as the "Lapland cow," prevalent in the North at the time is a hardy breed only about 110 cm tall and fully adapted to the Arctic conditions (Myllylä, 1991). Its stock suffered badly from the Second World War, as the cattle in the northernmost municipalities was typically slaughtered or sold to the Germans before the evacuation in 1944, and it is currently endangered with only a few hundred purebred individuals (Tervo, 2014). No bones of Northern Finncattle-sized cows were found, and based on the interviews, it appears that the German troops did not buy cattle from locals. This is understandable because the people of northern Lapland typically had very few cows. On the other hand, the memories describe how the Germans often unofficially bought milk of the Northern Finncattle from locals.

The bones of a large-sized foreign cattle breed clearly represent the official military supply chain of the German troops and form over 20% of the German soldier-related bone assemblage. Conversely, only one cattle bone was uncovered from a prisoner context. As mentioned above, the Germans transported large numbers of living cattle from Central Europe to southern Finland. Thus, these bones illustrate well the massive extent of the German military logistical organization, ranging from the shores of the Mediterranean to the Arctic Ocean (Seitsonen et al., 2017). Historian Lars Westerlund (2008, pp 47–48)

**FIGURE 8** Original caption: “German brothers-in-arms have supplied themselves with reindeer skin sleeping bags!” Photograph SA-kuva 82201/ Petsamo, Suonikylä-Kukkisjärvi/April 14, 1942



has estimated that German troops transported daily some 3000 tons of material along the poor roads across Northern Finland and up to 6000–7000 tons on the busiest tracks (also Seitsonen & Lundemo, 2021).

### 3.3 | Other domesticates

The other domesticates are present in small numbers, with less than 10 specimens each, but allow further insight to the meat supply. The few pig ( $N = 8$ ) and sheep/goat ( $N = 4$ ) bones in the assemblage represent likely the established German long-range military meat supply chain, alongside the cattle remains (Grabowski et al., 2014, for Norway). Like cattle bones, some of these exhibit signs of heavy industrial butchery. However, vending sheep to the Germans is also remembered by the locals (e.g., male informant, Kaamanen [Northern Sámi: *Gámas*], 10 years old in 1944, interviewed May 2017). These stories tell always of selling live animals to the Germans who slaughtered those themselves, in clear contrast to the remembrances of the reindeer trade. The locals have never mentioned seeing pigs or goats at least in Inari, Sodankylä (Northern Sámi: *Soadegilli*) or Enontekiö (Northern Sámi: *Eanodat*) regions during the war, and these are still uncommon in northern Finland. However, it is known from a German frontal magazine that occasionally, the Germans kept “pet pigs” at their encampments in Lapland (RH-31-XIII-5, 1944). Germans supplied pig meat also to the Finnish 6th Army, as mentioned in a logistics manual dating from 1941: “3rd day: Queen soup and fried pig meat and potato salad” (Airio, 2014, p. 207). According to the manual, 13 kg of pig meat was needed to prepare a meal for hundred men.

Encountered horse bones ( $N = 9$ ) were found at all sites among the food waste and likely originate from dead draught animals, because the Lapland environment took a heavy toll among the

Germans' horses. Horse meat provided variety to the staple canned meat diet but according to Finnish memoirs was not popular among the German troops (Aikavuori & Kulju, 2017, p. 65). One horse metatarsal from Iso Pihtijärvi (Inari Sámi: *Postjävri*) allowed biometric measurements, showing that at 15.4 hh (hands; approximately 161 cm), it was the size of a modern riding horse and larger than the average Finnhorse (15.1 hh). This fits with what is known of the horses used by Germans on the Arctic front, with a variety ranging from large Belgian brewery horses (average 16.6 hh), and Polish trotters (average 15.5 hh), to small robust Norwegian fjord horses (average 13.7 hh) (Westerlund, 2008, p. 49). The measured metatarsal has cutmarks that seem to originate from skinning the dead horse.

### 3.4 | Wild species

The elk bones ( $N = 5$ ) were all found from a German soldier-related context at Enontekiö Mallajoki. These are all limb bones and are likely attributed to hunting either by the Germans themselves or the local population. It is known that at places, both the German and Finnish soldiers hunted as a pastime to supplement their diets (e.g., Soikkanen, 1999), and elks are also hunted in the area nowadays.

Only a single fish bone was found in the assemblage, which might be due to sampling issues, actual scarcity of fish (excepting canned fish), or some other reason. One Gadidae cleithrum was found from a guard context at the Iso Pihtijärvi sawmill. This might originate from *Lota lota* (burbot) that is native to the area, or it could have been transported, for example as part of dried fish, from the Arctic Ocean or Atlantic coast where *Gadus morhua* (Atlantic cod) is traditionally dried (Airio, 2014, p. 217; Barrett, 2019). The sawmill lies in the vicinity of the *Eismeerstraße* (Arctic Ocean Road) and close to good fishing lakes, so both scenarios are possible.

The encountered bird bones illustrate probably the exploitation of local wild fowls. The juvenile galliform humerus from a guards' rubbish pit at Kankiniemi camp (Inari Sámi: *Kaŋgânjargâ*) cannot be identified to species. Its size suggests that it is likely *Lagopus sp.* This bird bone probably relates to the locals selling forest fowls for the Germans, often in exchange for alcohol and cigarettes. This activity is remembered in numerous local anecdotes that typically center on outwitting the Germans in some manner. A characteristic example is a host of stories found throughout Lapland that tell of selling skinned ravens (*Corvus corax*) to the Germans as wild fowls.

The ptarmigan ( $N = 5$ ) and hare ( $N = 12$ ) bones found from a prisoner context at Haukkapesäoja likely mirror the local memories of the prisoners supplementing their diets with various wilderness products, such as berries and small animals. The hare bones might all originate from a single individual, and the single small mammal rib from the same context is possibly from the same hare. Ptarmigan and hare are both easiest hunted by trapping during the long winter season, and their presence probably illustrates the relative freedom that the prisoners had to carry out hunting and fishing activities outside their tightly fenced off camp. Locals have maintained the names of some PoWs that they befriended with, such as one *Nikolai* remembered from Haukkapesäoja. The local men who worked at the forestry sites alongside the Russian PoWs have transmitted the memories about this man and his survival attempts in the wilderness. Apparently, Nikolai was a resourceful and skilled fisher and trapper, using whatever improvised materials he had at his use, as remembered in the folk stories:

He had even forged a lure from a horseshoe nail—Nikolai got some nice brown trout from the backwater pools under the ice—Vitamins were certainly reserved, as fish were eaten raw, with intestines, heads and tails—Ptarmigans Nikolai hunted with loops plaited from the horsehair—Birds he roasted over the hot ashes with their feathers (Ellert Kiviniemi, in Arvelin, 2009, p. 48).

Remembrances of the prisoners eating their fish as a whole might in fact explain the lack of fish bones in the prisoner deposits, as the bones might have been spitted wherever at the sites.

#### 4 | MATERIALITIES OF THE GERMAN MILITARY FOOD ECONOMY IN THE ARCTIC

The German supply situation on the Arctic front has been sparsely discussed in historical studies, and very little is known of its details (see Airio, 2014; Lundemo, 2020; Westerlund, 2008). Generally, the faunal remains uncovered from the German WWII military sites in Finnish Lapland appear to illustrate a tension between the established long-range military supply chain and the everyday demands posed by the alien environmental conditions on the German troops. Especially the strong presence of reindeer bones in the assemblage illustrates an

unexpected aspect of the German food economy that is lacking from the historical documents.

However, based on both the archaeological findings and historical documents, the everyday foundation of both the German soldiers' and their multinational prisoners' food economy was the military-issued canned food (Grabowski et al., 2014; Seitsonen & Herva, 2011). The canned food was supplemented with extra meat, such as reindeer, when possible. The numerous tins uncovered in the excavations included originally various kinds of supplies, such as meat, cheese, bread, fish, and vegetables. The local memories suggest that the tins used for bread (Ger. *Roggenschrotbrot*) were often opened from both ends, and there are in fact many such tins at the sites. Even if most of the tins lack any manufacturer stamps or other identifying information, fish tins originating at least from the occupied Norway and Denmark, as well as from Germany and Spain, have been found in the German deposits discussed here (Seitsonen, 2020, p. 130; for Norway, Figenschau, 2019; Grabowski et al., 2014).

Numerous artifacts were transported to the Arctic sites from across the German occupied Europe and beyond (Grabowski et al., 2014; Seitsonen, 2020; Seitsonen & Herva, 2011). The uncovered bones of cattle, ovicaprines, pigs, and horses presumably represent meat and animals imported to Finland along the established long-range military logistical chain. Due to the industrial butchery (Figure 6) enacted on many of them, it was not possible to obtain exact biometric data. However, this way of butchery is instructive in itself and implies that these bones arrived at the camps as ready-cut portions of meat, instead of live animals. There is some correlation between the closeness of main transportation routes and the higher number of imported species, but this varies between the sites. As the most illustrative example, no imported species were found at the sites situated over 10 km away from the main roads (Sites 6 and 8).

Based on the excavations, the prisoners' food economy relied consistently more on the military-issued canned food, sometimes encountered in the prisoners' rubbish pits as halved tins. Compared with the soldiers' deposits, their diet appears to have been far less supplemented with imported meat. Then again, bones of indigenous reindeer dominate both the soldiers' and prisoners' faunal remains. This clearly illustrates the local replenishment of the food supply, likely related to unofficial bartering with the local herders. There is slight correlation between the proximity of the main supply arteries and the lower percentages of reindeer. At all sites situated over 3 km away from the main routes, over half of the faunal remains consist of reindeer (Sites 4, 6, and 8). The relation of the species composition and the distance from the main supply lines would be an interesting aspect to study with a larger sample of German camps.

There are consistent and significant differences in the reindeer body portions found in the German soldiers' deposits and in the prisoner-related contexts (Figure 7). Bones from the meatier parts are found alongside the bones of imported animals in the soldiers' food waste deposits, whereas the leaner parts are encountered in the soldiers' mixed rubbish and among the prisoners' food waste. Local trans-generational memories emphasize that the reindeer arrived at the German camps as living animals that were slaughtered and skinned

there by the local herders. Reindeer was butchered in a far less industrial way than the other, imported species, and the near absence of butchery marks on bones suggests that this work was carried out by highly skilled individuals. The high number of lower limb bones suggests the initial handling of skins at the German sites, by removing these bones from the skins and dumping them among the soldiers' mixed refuse, instead of their food waste deposits. Then again, the lower limb bones encountered in the prisoner-related food refuse deposits likely mirror actual attempts to supplement their meager diets with whatever lean pieces of meat available. These were possibly scavenged from the skinning waste originally dumped in the guards' mixed refuse deposits.

Local recollections often highlight the prisoners' resourcefulness in supplementing their subsistence with hunting and fishing, wherever this was allowed by the German guards. This is illustrated in the faunal assemblage by the hare and ptarmigan bones from Haukkapesäoja, which most likely tell of the prisoners' trapping activities. Emphasis on this aspect might be related to the local worldviews, which center on the traditional, relational Northern environmental perception (Tervaniemi & Magga, 2019). During the war, most locals practiced a wilderness-based mixed herding, hunting, and gathering economy and often still do. Hunting and fishing activities were thus likely something that the locals working alongside the prisoners appreciated and paid close attention to. They possibly also advised the PoWs on the wilderness survival based on their own intimate landscape knowledge.

Many of the communal memories, as well as liaison officers' reports, tell of the abundant availability and use of alcohol by the Germans (Westerlund, 2008). This is materially evidenced by the vast amounts of bottle sherds and tops at the sites (Figenschau, 2019; Seitsonen et al., 2017). Germans had massive stocks of alcohol in the North that were used also as a common currency when bartering with locals. As we have discussed elsewhere, the German material remains illustrate two different ways to ease the acute displacement and alienness felt by the soldiers on the Arctic front: an escapist approach and a control-based approach (Seitsonen et al., 2017). The first is above all highlighted by the copious alcohol use that allowed one way to alleviate the feelings of dislocation and placelessness that the German soldiers experienced in an unfamiliar Arctic environment (Figenschau, 2019; Seitsonen, 2018, p. 106; Seitsonen et al., 2017). The latter, control-based response, is illustrated, for example, by the clear intrasite organization and the tidy waste management arrangements at the sites, such as keeping the food refuse, including bones and tins, separated from the mixed general rubbish (Seitsonen, 2018, pp. 163–164).

Most of the waste accumulated understandably in the rubbish pits and dumps used by the German guards, because the material culture of PoWs was meager, and they most likely attempted to reuse all the available materials (see Carr et al., 2017; Carr & Mytum, 2012; Seitsonen, 2020; Theune, 2018). The lower limb bones of reindeer encountered among the prisoners' food waste might have been scavenged from the skinning waste dumped in the guards' mixed waste deposits to supplement the poor diet. On the other hand, a soup made of the lean lower limb bones (Northern Sámi: *gazzamális*; Finnish:

*koparakeitto*) and cooked for several hours is in fact a common local food in Lapland (for a recipe, see Länsman, n.d.). Thus, the presence of these bones in the prisoners' food waste might also relate to the locals advising them on how to adapt to and survive in the extreme northern conditions.

## 5 | CONCLUSIONS

The faunal remains uncovered from Lapland's Second World War German military sites illustrate various perspectives absent from the historical documents. They especially highlight the importance of supplementing the military-issued logistical chain unofficially with local products, namely, with the indigenous reindeer meat. This is also often remembered in the local transgenerational memories. Analogous local supplementing of food situation has been observed at the Sværholt PoW camp excavated in Norway. Sværholt is on the shore of Arctic Ocean, so there, the food supply was complemented with the local fresh and dried fish, mostly cod (*Gadidae*), with some haddock (*Melanogrammus aeglefinus*), and possibly other species (Grabowski et al., 2014). At both the studied Finnish sites and at Sværholt, the smaller numbers of cattle, ovicaprine, and pig bones mirror likely the official military supply chain.

Even if reindeer dominates both the guards' and prisoners' faunal assemblages, there are significant differences in the encountered body parts. Bones originating from the meatier parts of the animal are consistently found in the soldier-related deposits, whereas bones from the leaner bits dominate the prisoners' food waste. The latter might have been scavenged from the skinning waste originally dumped among the soldiers' mixed waste. The signs of handling reindeer skins and extracting bone marrow at the sites offer material support to the local stories that the reindeer herders butchered and skinned the animals they sold to Germans, instead of handing them over as live animals. These offer one material reminder of the close interactions between the local Sámi and Finns, German troops, and multinational prisoners. It might in fact be that the locals advised the prisoners on survival skills, for instance, how to hunt and trap in the northern conditions and how to cook *gazzamális* soup of the lean reindeer lower limb bones.

The remains of wild fauna found among the prisoners' rubbish likely tell of the prisoners unofficial hunting activities to supplement their meager supplies. This is also remembered in the local memories we have collected (also Arvelin, 2009). In the Sværholt assemblage, the prisoners' hunting or trading activities are illustrated by fox bones (Olsen & Witmore, 2014). The German military administration in fact had plans to start feeding foxes from breeding farms to the prisoners, but it appears that this plan was never realized (Lundemo, 2010, p. 46).

Besides the food supply and logistical situation in the Arctic front, the faunal remains illustrate broader anthropological question about the displacement experienced by German troops in the North and adaptation to the local conditions. The orderly treatment of faunal remains and other waste tells about a control-based answer to this,

whereas the copious use of alcohol, as evidenced by the abundant bottle sherds, allowed a temporary escapist getaway. These illustrate the wider interpretations and narratives that can be drawn from the small, mundane things-of-war, such as fragmented bones and glass sherds that have a potential to reach beyond the historical documents. This highlights the importance of studying also recent past faunal materials related to superficially familiar contexts.

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## CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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