

## CHAPTER 15

## FROM BOVID TO BEAVER

*mammal exploitation in Medieval northwest Russia*

MARK MALTBY

## INTRODUCTION

THIS chapter reviews the current state of knowledge regarding the exploitation of mammals in northwest Russia from AD c.900 to 1500. The discussion draws largely upon evidence obtained from the town of Novgorod and its hinterland with reference to other sites in the region. Although based principally on zooarchaeological data, this summary will also refer to other types of archaeological and documentary evidence. This survey will be concerned only with mammals. For information on birds and fish, readers are referred to Maltby (2012).

Novgorod (Fig. 15.1) was, according to some chronicles, founded in the mid-ninth century AD, although the earliest archaeological features date to the early tenth century. It is situated on the River Volkhov, to the north of Lake Ilmen, in an area that began to be heavily populated from the seventh century AD. Average temperatures now range from  $-8^{\circ}\text{C}$  in January to  $18^{\circ}\text{C}$  in July with 120–135 days of snow cover and annual precipitation of 650–700 mm (Spiridonova and Aleshinskaya, 2012). There are large numbers of small ninth- to tenth-century settlements on the more fertile lands in this area, the most important of which was the fortified centre of Rurik Gorodishche, from where a substantial faunal assemblage has been collected mainly from ninth- to tenth-century deposits (Maltby, 2012). The area was originally heavily forested but clearances took place throughout the Medieval period and by the late thirteenth century much of the forest had been replaced by arable and meadows.

The emergence of Novgorod was due principally to its role as an international trading centre. Along with Staraya Ladoga to the north, Novgorod acted as a gateway for access to the region's forest resources and other commodities and had extensive trading links to the Baltic in particular. It acquired direct or indirect control of huge territories, which at times stretched from the Baltic to the Urals. Wealthy merchants (boyars)

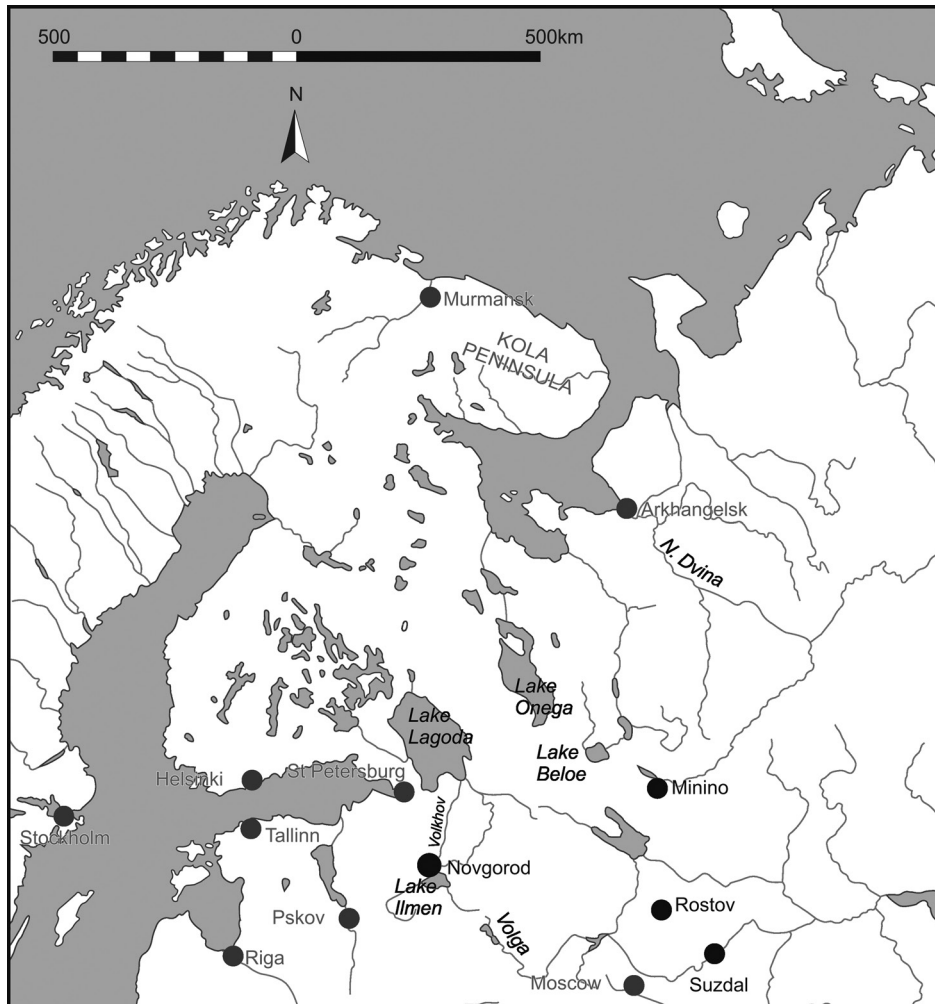


FIGURE 15.1 Location of sites mentioned in the text.

built properties within the town and they had a complex political relationship with the Novgorodian royal dynasty. Overseas traders, particularly from Germany, also took up residence in the town (Brisbane et al., 2012: 4–9).

Extensive excavations since the 1930s in various parts of Novgorod have revealed very deep anaerobic layers that have provided superb preservation conditions for organic materials including wood, plants, textiles, and leather. Sequences of wooden roadways and associated buildings have been investigated. Nearly one thousand birch-bark documents have been discovered, affording insights into the lives of the literate classes and providing records of items brought to the town as tribute. Animal bones also survive well and summaries of data from some excavations have been published (Tsalkin, 1956). Unfortunately, until quite recently, animal bones have subsequently not been retained.

Most of the evidence discussed here comes from the Troitsky sites situated in the southwest of the town (Maltby, 2012).

Evidence for animal exploitation in the forest zone comes mainly from around the area of Byeloozero, where several sites at Minino on Lake Kubenskoye have been excavated (Makarov, 2012). This region lay on the edge of the Rostov-Suzdahl territory that bounded Novgorodian lands about 500 km to the east of Novgorod.

## THE EXPLOITATION OF CATTLE

Novgorod faunal assemblages have consistently been dominated by cattle, which usually provide over 70% of the NISP counts of cattle, sheep/goat, and pig (Table 15.1). Although this may partly reflect bias towards the recovery of large bones in hand-collected assemblages, it is clear that beef was the dominant meat product consumed in the town throughout the Medieval period. Slightly earlier ninth- to tenth-century assemblages from sites in Novgorod's hinterland have included relatively fewer cattle bones, and they are outnumbered by pig at Georgii and in the northern area of Ryurik Gorodishche. This may reflect more efficient recovery of pig bones in assemblages partly collected by sieving. However, the percentage of cattle at Ryurik Gorodishche also increased to levels comparable to Novgorod in the eleventh- to twelfth-century deposits (Sablin, *in press*), which suggests that more cattle were being kept and consumed in the region after Novgorod was founded. Local pollen profiles show significant increases in meadowland during this period (Spiridonova and Aleshinskaya, 2012). Novgorod's hinterland is well suited for cattle with abundant pasture available in the Volkhov floodplain and along the shores of Lake Ilmen.

Assemblages from other western Russian Medieval towns also show that cattle are consistently very well represented usually forming over 50% of the total cattle, pig, and sheep/goat NISP counts. Comparing other urban and castle assemblages from northeast Europe, only the post-Medieval assemblage from Tornio in Finland (Puputti, 2008) has produced over 60% cattle (Table 15.1). It would appear that the urban populations of northwest Russia were more reliant on cattle than in areas to the west.

Tooth ageing analysis from Ryurik Gorodishche and Novgorod shows that most cattle were killed between 3 and 8 years old (Table 15.2: stage 6). Many of these cattle would have provided calves, milk, and/or traction power prior to slaughter. However, quite a small percentage of mandibles belonged to old animals (Table 15.2: stage 7). In Novgorod there was also a significant kill-off of second- and third-year cattle (Table 15.2: stages 4–5). Animals slaughtered in their second year (mainly stage 4) were much less common in the earlier Ryurik Gorodishche assemblage, which suggests that the focus on beef production became more pronounced in the later Medieval period.

At both Ryurik Gorodishche and Novgorod, substantial numbers of calves aged 2–6 months old were also represented (Table 15.2: stage 2). This suggests that veal was quite

**Table 15.1 NISP percentages and ratios of cattle, pig, and sheep/goat from Novgorod and its hinterland and from some other northeastern European towns and castles**

Town/Site	Date	Cattle	Pig	S/G	C:P	S/G:P	NISP	Source
Novgorod Troitsky IX	10-E12	70	22	8	3.19	0.34	3,423	Maltby, 2012
Novgorod Troitsky X	10-E12	74	20	6	3.60	0.29	6,464	Maltby, 2012
Novgorod Troitsky XI S22-14	10-E12	66	23	11	2.89	0.49	12,376	Maltby, 2012
Novgorod Troitsky XI S13-8	M12-E13	71	22	8	3.22	0.34	4,971	Maltby, 2012
Novgorod Troitsky XI S7-1	M13-E15	73	18	9	4.11	0.49	4,718	Maltby, 2012
Novgorod, Desyatiny-1	10-16	75	21	4	3.57	0.20	5,503	Zinoviev, in press
Novgorod, Nerevsky	11-15	80	15	6	5.45	0.39	10,416	Tsalkin, 1956
Novgorod, Slavensky	13-17	80	13	7	5.98	0.51	10,056	Tsalkin, 1956
Gorodishche 1979-1996 (all)*	9-10	53	40	6	1.31	0.16	3,906	Maltby, 2012
Gorodishche 1979-1996 (North)	9-10	35	58	7	0.60	0.13	835	Maltby, 2012
Gorodishche 1979-1996 (South)	9-10	72	27	2	2.66	0.06	1,322	Maltby, 2012
Gorodishche 2000-2004 (North)	9-10	43	48	9	0.90	0.19	2,572	Sablin, in press
Gorodishche 2000-2004 (North)	11-12	70	21	8	3.27	0.39	862	Sablin, in press
Georgii	9-10	42	52	6	0.82	0.12	483	Maltby, 2012
Prost	9-10	47	45	8	1.02	0.18	187	Maltby, 2012
Minimo	11-13	40	16	44	2.41	2.64	794	Savinetsky, in press
Staraya Ladoga	8-10	56	36	8	1.55	0.22	12,216	Tsalkin, 1956
Pskov	9-12	70	22	8	3.14	0.35	8,001	Tsalkin, 1956
Moscow, Zaryadrey	10-17	65	25	10	2.62	0.39	22,468	Tsalkin, 1956
Moscow, Romanov Dvor	12-19	44	26	30	1.49	1.13	11,092	Maltby, in press

(Continued)

Table 15.1 Continued

Town/Site	Date	% NISP						S/G:P	C:P	NISP	Source
		Cattle	Pig	S/G	C:P	S/G:P	NISP				
Staraya Ryazan	11–13	60	28	12	2.18	0.44	7,234	Tsalkin, 1956			
Tver, Kremlin	13–E15	61	27	12	2.23	0.45	31,485	Lantseva and Lapshin, 2001			
Grodno, Belarus	11–15	40	38	22	1.06	0.57	6,546	Tsalkin, 1956			
Vilani, Estonia	13–17	52	14	34	3.77	2.48	23,926	Rannamäe, 2010			
Turku, Finland	13–19	49	13	38	3.95	3.08	37,667	Tourunen, 2008			
Tornio, Finland	17	61	10	29	6.01	2.84	1,939	Puputti, 2008			
Wolin, Poland	9–12	17	71	12	0.24	0.17	28,717	O'Connor, 2010			
Szczecin, Poland	9–11	12	78	9	0.16	0.12	22,088	O'Connor, 2010			
Poznan, Poland	10–12	35	24	41	1.51	1.74	10,081	O'Connor, 2010			
Legnica, Poland	10–12	43	50	6	0.86	0.12	4,727	O'Connor, 2010			
Opole, Poland	10–12	30	56	14	0.52	0.25	11,561	O'Connor, 2010			
Gdansk, Poland	10–12	30	53	17	0.56	0.31	18,320	O'Connor, 2010			
Malbork Castle, Poland	14–18	45	34	21	1.34	0.62	1,611	Maltby et al., 2009			
Jersika hillfort, Latvia	9–13	51	33	16	0.65	0.31	2,257	Maltby et al., in press			
Cēsis Castle, Latvia	13–18	53	12	35	1.53	2.96	42,385	Maltby et al., in press			
Vecdole Castle, Latvia	13	49	36	15	1.34	0.43	973	Maltby et al., in press			
Ventspils town, Latvia	14–15	53	20	28	1.91	1.41	459	Maltby et al., in press			
Riga Castle, Latvia	13–16	54	22	24	2.40	1.09	368	Maltby et al., in press			

**Table 15.2 Cattle mandible ageing stage percentages from Gorodishche and Novgorod Troitsky sites IX–XI**

Stage	Gorodishche (N = 50)	Troitsky IX (N = 178)	Troitsky X (N = 240)	Troitsky XI (N = 364)
1	-	1	1	1
2	16	6	7	11
2–3	-	-	1	0
2–4	2	3	3	3
3	-	4	4	6
3–4	-	2	5	3
4	2	14	14	12
4–5	-	3	2	5
5	6	5	3	8
5–6	12	7	8	9
5–7	2	4	9	8
6	50	36	35	27
6–7	8	9	7	5
7	2	6	3	4

frequently eaten and that milk production was an important consideration in cattle husbandry. Metrical analysis of the metacarpals has indicated that around three-quarters of the adult cattle from Rurik Gorodishche and from the tenth- to twelfth-century deposits from Novgorod were females. Even fewer adult males were represented in the later Medieval deposits from Novgorod, concomitant with an increase in the percentage of mandibles of young (presumably mainly male) calves (Maltby, 2012). This implies that dairy production had become more important.

Butchery marks, mostly made by heavy blades and cleavers, were observed on 30% of the cattle bones from the Troitsky sites in Novgorod. There was a lot of variability in the location and nature of these butchery marks. This inconsistency, combined with the presence of bones from body areas of poor meat quality alongside those with high protein value, strongly suggests that complete carcasses were commonly processed within all of the properties investigated. In contrast, the ninth- to tenth-century layers from the southern area of Rurik Gorodishche produced a much higher percentage of cattle elements than the northern area (Table 15.1), and a significantly higher proportion of foot and cranial elements (Maltby, 2012). This could indicate that the southern area, on the periphery of the settlement, was where much of the primary processing of cattle was carried out. Similar dumps have as yet not been recognized in Novgorod.

Leather artefacts and offcuts have been found on many northern Russian Medieval settlements including Rurik Gorodishche and Novgorod (Kurbatov, 2012). Many of those from Novgorod were from cattle hides and calfskins (Solovyov, 2012). Some insects found on the Troitsky sites are types that infest hides stored for processing (Reilly, 2012). Fine incisions, indicative of initial skinning, were observed on many cattle first phalanges (Maltby, in press). This suggests that hide preparation and

leather production took place within a number of different properties. Footwear was a particularly common product and the eleventh- to twelfth-century deposits at Ryurik Gorodishche have produced evidence for the presence of craftspeople making high-quality footwear on this high-status site, whereas contemporary craftspeople in Novgorod were producing less elaborate products perhaps for a wider market (Kurbatov, 2012: 406).

Recent metrical analysis of cattle bones from Novgorod and Ryurik Gorodishche has confirmed previous observations that cattle in this region were of small stature (Tsalkin, 1956). Measurements of 155 complete limb bones from the Troitsky sites produced withers heights estimates ranging between 95.6 cm and 127.5 cm with a mean of 109.8 cm. Twenty-nine specimens from ninth- to tenth-century levels at Ryurik Gorodishche ranged between 100.5 cm and 123.2 cm, with a slightly higher mean of 112.0 cm. It seems that the average size of cattle decreased during the Medieval period. Mean values of length, breadth, and depth measurements of limb bones were 3–10% higher in the ninth- to tenth-century levels at Ryurik Gorodishche than in the thirteenth- to fifteenth-century levels from Novgorod (Maltby, in press). Although the low numbers of bones of bulls and oxen in the later deposits could account for some of this decrease, measurements of loose teeth, which are less susceptible to sexual dimorphism, also indicate a slight decrease in size. Travellers to Russia in the sixteenth and seventeenth century commented on the small size of cattle in the region (Kurbatov, 2012: 393).

## THE EXPLOITATION OF PIGS

Pigs have been the second most common species recorded from the various sites in Novgorod, forming 13–23% of cattle, pig, and sheep/goat counts. Pigs are generally better represented in the earlier assemblages at Ryurik Gorodishche and Georgii, where they sometimes outnumbered cattle (Table 15.1). The relative frequencies of pig and sheep/goat have been compared using the sheep/goat/pig index (after O'Connor, 2010). This ratio ranges between 0.20 and 0.49 in the hand-collected assemblages from Novgorod, indicating that pigs were consistently better represented than sheep/goat. The ratio of sheep/goat is even lower in the ninth- to tenth-century assemblages from Georgii, Prost, and Ryurik Gorodishche (0.06–0.19), probably reflecting that more forest was available for foraging pigs prior to the main phases of agricultural clearances during the later Medieval period. In contrast, pigs contributed only 27% of the total pig and sheep/goat assemblage from Minino, despite high percentages of woodland wild mammal bones in that sample. It is possible that climatic conditions were less favourable for pig keeping. The area has lower mean winter temperatures and longer and deeper coverings of snow (Spiridonova and Aleshinskaya, 2012) that would be less favourable for winter foraging by free-range pigs.

Comparisons with other Russian and eastern European urban and castle assemblages show substantial variations in the abundance of pigs. Pig percentages from

Novgorod are broadly similar to those from Pskov, the Zaryadrey site in Moscow, Staraya Ryazan, and Tver. Pigs are substantially better represented at Staraya Ladoga, although still heavily outnumbered by cattle (Table 15.1). None of the Russian assemblages are dominated by pigs in contrast to most urban sites in northern Poland (O'Connor, 2010).

Tooth ageing analyses from Ryurik Gorodishche and earlier layers from Novgorod have shown that substantial numbers of pigs were killed in their first year (*c.*30% of the mandibles recovered). The presence of neonatal mortalities from Ryurik Gorodishche indicates that pigs were bred there. Neonatal pigs have not been recorded at Novgorod, which perhaps indicates they were not commonly kept within the town, although further sieving is needed to confirm this. The proportion of juvenile pigs decreased significantly (to *c.*5%) in the thirteenth- to fifteenth-century deposits from Novgorod, suggesting that pigs became less intensively exploited in the town. Most of the other pigs recovered from Novgorod and its hinterland were culled in their second and third years with jaws of third-year animals becoming more common in the later Medieval assemblages (Maltby, in press).

Over 45% of the pig elements from the Troitsky sites in Novgorod are cranial elements (Maltby, in press), probably indicating that butchery often took place within the properties. However, percentages of upper limb bones gradually increased in the later Medieval deposits, possibly indicating that joints of fresh and preserved meat were more commonly brought to the urban properties. The low numbers of foot bones from all the Novgorod sites may also indicate that trotters were often previously removed, although further sieving is again required to establish whether the paucity of these relatively small bones is not simply a factor of retrieval bias.

Metrical analysis of bones and teeth from Novgorod and its hinterland sites showed that the vast majority of the porcine specimens fell comfortably within the size range of domestic pigs rather than the larger wild boar. The pigs from the ninth- to tenth-century assemblages from Ryurik Gorodishche, Georgii, and Prost tended to be slightly larger than those from Novgorod. More bones of smaller pigs were found in later Medieval deposits from the Troitsky sites. The decrease may reflect the presence of a larger proportion of sows in the later assemblages (although this needs to be confirmed by analysis of sexing data). Another possibility is that pigs generally became slightly smaller in the later Medieval period, perhaps reflecting the decrease in prime woodland habitats in the region.

## THE EXPLOITATION OF GOAT AND SHEEP

In the ninth- to tenth-century assemblages from Ryurik Gorodishche, 43% of the thirty-five diagnostic sheep/goat bones belonged to goats (Maltby, 2012). About one-third of the forty-six measured metapodials from the Troitsky sites in Novgorod belonged to goats. Goats are reported to outnumber sheep on the neighbouring Desyatiny site (Zinoviev, in press). It seems that goats formed a much higher proportion of the caprine



assemblage in Novgorod than in most central and eastern European sites. For example, in the seventeenth-century sample from Tornio, Finland, only 1% of the diagnostic elements were identified as goat (Puputti, 2008). Some goats were probably kept in Novgorod itself both for meat and milk. Goat horns (particularly large ones of males) were also frequently imported for working in Novgorod and other towns. At Viljandi, Estonia, 90% of the horn cores and skulls belonged to goat, whereas 66% of the measured metacarpals were classified as sheep (Rannamäe, 2010).

Sheep/goat elements are poorly represented on most Medieval sites in northwest Russia, often forming < 10% of cattle, pig and sheep/goat NISP counts (Table 15.1). This is largely due to environmental factors. Much of the land around Novgorod, for example, was unsuitably wet or wooded for sheep grazing. In contrast, at Minino, sheep/goat formed 44% of the cattle, pig, and sheep/goat counts, reflecting the development of agricultural land and the increase in dry pasture more suitable for sheep.

Not all the sheep/goat mandibles used in ageing analyses from these sites have been identified specifically as sheep or goat, which limits interpretations of slaughter patterns, as the two species may have had different mortality profiles. However, over half the mandibles from the Troitsky sites belonged to sheep and goats under 2 years old. Such a high percentage of immature animals indicates that sheep and goat exploitation was mainly focused on meat production. The presence of significant numbers of mandibles from lambs and kids younger than three 3 months old may also indicate exploitation for milk. On Troitsky XI, the percentage of immature sheep and goats decreased in the thirteenth- to fifteenth-century deposits, indicating that meat production became less intensive. The corresponding increase in the proportion of mandibles from mature adults indicates that wool production had increased in importance. Most of the textiles from Novgorod dating from the tenth century onwards were made of woollen cloth. Wool and cloth were very important commodities traded in vast quantities throughout Medieval Europe. Some of the textiles found in Novgorod were clearly imported (Kublo, 2012). However, local production was more common. Racks for cleaning wool have been discovered in one Troitsky property and other wooden objects associated with cloth production are common finds in Novgorod. Goat skins were common components of footwear (Solovyov, 2012) and skins of both sheep and goats are mentioned in birch bark documents (Rybina, 2001).

Measurements of twenty-one complete sheep limb bones from the Troitsky excavations provided withers height estimates ranging between 55.0 and 65 cm with a mean of 59.7 cm. There were no clear chronological variations.

## THE EXPLOITATION OF HORSE

Horse bones formed 9% of the domestic mammal remains of the ninth- to tenth-century Rurik Gorodishche assemblage, although these include associated groups, the

presence of which implies that many horse carcasses were not fully processed for food (Maltby, 2012). However, excluding the skulls discussed below, 5% of the horse bones from Rurik Gorodishche bear processing marks, including those made during dismemberment and filleting, indicating some consumption of horsemeat. In addition, at least twenty-two complete horse skulls (some associated with mandibles) were deposited in the defensive ditch when it was infilled in the late ninth century (Sablin, *in press*). The skulls were spread across at least twenty square metres. This appears to have been a ritual deposition. All these horses were male and ranged between 5 and 15 years of age. Bit wear damage to the second premolars indicated that many of them had been used for riding. These may have been horses acquired by the Prince of Novgorod's armed forces.

Horse bones have a small but consistent presence in the Novgorod assemblages. They formed 5% of the domestic mammal counts on the Troitsky sites and the ratio of horse to cattle ranged between 0.05:1 to 0.15:1 on Novgorod sites. Although horses were not a regular source of food, 17% of their bones from the Troitsky sites bore processing marks. Some marks, particularly those on the phalanges, metapodials, and radii, were made during skinning and bone-working but many others, particularly those located on the scapula and upper limb bones, indicate dismemberment and filleting (Maltby, 2012). It seems that some inhabitants of Novgorod consumed horseflesh throughout the Medieval period. Elsewhere in the region, unusually high ratios of horse to cattle were recorded at Grodno, Belarus (0.35:1), and Staraya Ryazan (0.28:1) (Tsalkin, 1956), although it is unclear whether these counts were biased by the inclusion of bones from horse skeletons. These results lie in stark contrast to those from many towns in the northern Baltic, where horse bones form very low percentages of the faunal assemblages.

Although horses were sometimes eaten, their hides made into leather, and some of their bones made into artefacts, particularly skates, they were mainly valued for riding and as pack animals and could expect a long life. Nearly all the horse bones found in Novgorod are from adults. Plant macrofossil and insect evidence indicates that horses were stabled in various Novgorod properties (Monk and Johnston, 2012; Reilly, 2012). Birch-bark documents allude to horses much more frequently than to any other species (Rybina, 2001), reflecting their high status.

Withers heights of horses at Rurik Gorodishche averaged around 142–144 cm, the size of large ponies, but these are *c.*10 cm larger than the average size of those recorded on later Medieval sites in Russia (Tsalkin, 1956). Estimates of horse withers heights from ninety-three complete limb bones from the Troitsky sites ranged between 117 cm and 153 cm, with a mean of 133.4 cm (Maltby, *in press*).

## THE EXPLOITATION OF WILD MAMMALS

There is little evidence that wild mammals played a significant role in the diet of the inhabitants of Medieval Novgorod or in other major centres in the region. Bones of

wild mammals formed 1% or less of the total mammal assemblage from the Troitsky excavations. Similarly low percentages have been obtained from other Novgorod sites (Table 15.3). The high percentage from the Desyatiny site is the result of a much higher proportion of the porcine bones being designated as wild boar (Zinoviev, in press). Excluding wild boar, the percentages of wild species from this site are as low as those from other Novgorod sites.

Hare has been the most common wild species recovered from the Troitsky sites. Many hare bones, however, may have been overlooked during excavation. Elk was the species which probably provided most meat. Bones from all parts of their skeletons have been found in Novgorod, indicating that their carcasses were sometimes brought to the town for final processing. In addition, large numbers of elk antlers were imported for specialist manufacture of combs and other artefacts. Many antler offcuts have been found within some properties.

The pivotal role of Novgorod in the international fur trade is well attested by documentary sources (Martin, 1986). Thousands of pelts were collected annually from the forest zones of northern Russia, with beavers and squirrels being particularly important. There are frequent references to squirrel pelts in Novgorodian birch-bark documents and seals of cylinders containing furs brought as tribute have also been discovered (Makarov, 2012). However, the great importance of fur-bearing species is not reflected in the zooarchaeological record from Novgorod and settlements in its immediate hinterland.

Only small numbers of beaver bones have been recorded from Novgorod sites (Table 15.3). Foot bones are under-represented, probably previously being removed with the skins, although again retrieval bias may be a problem. Butchery marks were observed on 35% of their bones, including skinning marks on crania. However, most of the marks were associated with meat processing (Maltby, in press).

Even fewer squirrel bones have been recovered from Novgorod itself. Further sieving could produce more evidence for these and other fur-bearing species (marten, otter, polecat, stoat, fox, lynx, bear, wolf, sable) which have also only rarely been found in excavations of the town (Table 15.3). Third phalanges were the only bear bones identified in the Troitsky assemblage. Some of these could have been amulets but it is probable that others were attached to bearskins brought to the town.

Nor is there much evidence for the exploitation of wild mammals in the immediate hinterland of Novgorod. Despite extensive sieving, bones of wild species provided < 3% of the mammal assemblage from Rurik Gorodishche, although smaller species such as hare and squirrel were slightly better represented, and wolf, fox, stoat, and marten have also been identified. Wild mammal bones were slightly more common in the Georgii assemblage. Most of these belonged to elk, although several fur-bearing species (including bear and lynx) were present. At Prost, foot bones from the processed skins of at least four pine martens were found in one deposit (Table 15.3).

Evidence for large-scale fur procurement has mainly been found in more remote parts of the forest zone, for example, at Minino, where wild species made up 65% of the

**Table 15.3 Wild mammal species counts (NISP) from recent excavations in Novgorod and its territories**

Site	Date	Bos	Elk	Rein.	Roe	Hare	Boar*	Bear	Squirr.	Beav.	Otter	Mart.	Pole.	Stoat	Fox	Lynx	Wolf	Badg.	Mac	Total		Wild ex. boar	
																				wild	mamm.		%
Troitsky IX	10-E12	9	2	14	1	18														44	3,701	1.2	1.2
Troitsky X	10-E12	5		5	1	16														27	6,876	0.4	0.4
Troitsky XI S22-14	10-E12	16		26	1	64														112	13,333	0.8	0.8
Troitsky XI S13-8	M12-E13	34		20	1	2														61	5,302	1.2	1.1
Troitsky XI S7-1	M13-E15	16	1	49	2	2														71	5,084	1.4	1.3
<i>Troitsky IX-XI</i>	<i>Total</i>	<i>80</i>	<i>3</i>	<i>114</i>	<i>4</i>	<i>100</i>	<i>9</i>	<i>3</i>	<i>100</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>6</i>	<i>1</i>	<i>8</i>	<i>5</i>	<i>315</i>	<i>34,296</i>	<i>0.9</i>	<i>0.9</i>
Desyatiny-1*	10-16	1		4	3	177	1	2												192	5,503	3.4	0.3
Nerevsky	11-15	37		9	5	29														104	9,850	1.0	1.0
Slavensky	13-17	13			6	3														23	8,424	0.3	0.2
Gorodishche 79-96	9-10	7		44	1	23														92	4,351	2.1	2.1
Gorodishche 2000-4	9-10	3		24		12														51	3,232	1.6	1.6
Gorodishche 2000-4	11-12	27		3	4	3														36	1,085	3.3	2.9
Georgii	9-10	18		1	1	1														25	558	4.5	4.5
Prost	9-10	1				1														56	260	21.5	21.5
Minino	11-E12	31	7	2	6	2		214	423	4	45	2	5							741	1,021	72.6	72.5
Minino	L12-13	56	4	2	13	6	2	153	183	7	40	4	5							476	819	58.1	57.8
Minino	11-13	20	2	2	5	7		56	252	1	19	1	1							366	611	59.9	59.4
<i>Minino</i>	<i>Total</i>	<i>107</i>	<i>13</i>	<i>6</i>	<i>24</i>	<i>15</i>	<i>2</i>	<i>423</i>	<i>858</i>	<i>12</i>	<i>104</i>	<i>7</i>	<i>11</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1,583</i>	<i>2,451</i>	<i>64.6</i>	<i>64.4</i>

identified mammals. Beaver, which also provided significant amounts of meat for the local community, formed 35% of the assemblage. In addition, large numbers of squirrel and marten bones were recovered and bones of otter, polecat, fox, and bear were also found (Savinetsky, in press). Several other settlements in the Beloozero and Vologda regions have also produced assemblages containing substantial percentages of bones of fur-bearing species (Makarov, 2012).

The percentage of beaver halved in the thirteenth-century assemblage from Minino and percentages of squirrel and marten also decreased (Table 15.3). Over-exploitation and woodland clearance are both likely to have been factors in their decline. This is also reflected in the Novgorod assemblages. Beaver bones were largely absent from thirteenth-century and later deposits on the Troitsky sites. References to beavers on birch-bark documents disappear after the early thirteenth century (Rybina, 2001). Most of the beaver population in European Russia had disappeared by the nineteenth century because of over-exploitation (Zinoviev, in press). Therefore, evidence for Novgorod's role in the international fur trade is best reflected in the composition of the animal bone assemblages on supply sites like Minino rather than in the town itself. This is not surprising as the trade was in furs and pelts, not meat and bones.

Variations in the presence and relative abundance of different wild mammal species depends upon a variety of factors including local climatic conditions and vegetation, date, and the social status of the settlement. Thus, it is no surprise to see that bones of seals occur only on the most northerly sites such as Tornio and Staraya Ladoga (Tsalkin, 1956; Puputti, 2008). The discovery of a macaque skull from a late twelfth-century deposit in Ryurik Gorodishche indicates the import of an exotic species (native to North Africa) to this high-status site. The macaque may have been a gift to the Prince or part of a menagerie (Brisbane et al., 2007).

## CONCLUSIONS

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This brief review of mammal exploitation in Medieval northwest Russia relies heavily on evidence from Novgorod and its hinterland. Although many of the same species as elsewhere in northeastern Europe were exploited, there were some distinctive variations. Novgorodians ate relatively more beef than the inhabitants of many contemporary towns. Lamb and mutton were much less important and goats may have been as important as sheep as a food resource. Dairy produce may have become more prevalent in the later Medieval period. Meat from horses and beavers supplemented their diet, at least until the latter became a rare commodity because of over-exploitation for its fur. Wild mammals generally provided only a small portion of the diet. The vast importance of the fur trade is not reflected in the bone assemblages from Novgorod itself but is evident in areas where fur-bearing species were hunted.

Zooarchaeological studies can provide many insights into the lives of residents of Medieval Novgorod where the superb preservation conditions for organic materials, allied with documentary evidence, provides exciting opportunities for multidisciplinary research. Future intra-site comparisons have the potential to study fine-grained chronological variations in animal exploitation between different neighbourhoods. Detailed examination of assemblages from within individual properties can provide insights into how space was utilized within them. However, to achieve these and other aims, there needs to be a sampling policy that is fit for this purpose. As yet, the importance of birds and especially fish in the Novgorodian diet cannot be fully assessed because very few sieved samples have been analysed with which to make comparisons to assemblages from other sites in the region where such sampling has been carried out.

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