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Inhoudsopgave

The role of elk (*Alces alces*) in the Dutch Bronze Age

Between wild and domestic?

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Keywords: elk (Alces alces), deposition, human-animal relationship, Bronze Age, The Netherlands

Introduction

The Eurasian elk (*Alces alces*), the largest extant deer species in Europe, was once an impressive fixture of the Dutch ecosystem. Archaeological evidence has shown that it was not until the Middle Ages that the elk was extirpated in the Netherlands and many other European countries, due to overhunting, deforestation, and wetland redevelopment (Jensen et al. 2020; Schmölcke & Zachos 2005; Walch 2000a). Despite being an indigenous animal, not much is known about the elk's existence in the Netherlands nor its relationship with humans. The last study on elk stems from over 20 years ago (Walch 2000a; 2000b). Since then, there has been an exponential increase in excavations in the Netherlands, yielding rich faunal records. While few in absolute terms, elk remains are relatively common in the Dutch archaeological record. Moreover, the discovery of three young elk skeletons deposited in a Bronze Age well, a unique find for Dutch – and possibly northern European – archaeology, provides an opportune starting point to explore past human-elk relationships.

In this article, we investigate the role of elk in the Dutch Bronze Age (2000-800 BCE). We focus on this period not only due to this unique deposition but also because this period has yielded the most elk finds. This makes it an intriguing period for the study of human-elk relationships. Furthermore, wild animals are often neglected in the study of farming societies, with the emphasis being instead on domesticates. This research is part of a broader project on elk in the Dutch Holocene.

Bronze Age finds

In the Netherlands, elk remains have been found at archaeological sites dating from the Palaeolithic until the Modern Period. A total of 707 finds have been recorded to date

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No.	province	place	toponym	number of finds	reference
1	Flevoland	Schokland	J98	1	Gehasse 1995
2	Flevoland	Schokland	P14	6	Gehasse 1995
3	North-Holland	Andijk	III	5	Aal 2015
4	North-Holland	Bovenkarspel	Het Valkje	7	IJzereef 1981
5	North-Holland	Enkhuizen	Haling 13	1	Van der Jagt 2014
6	North-Holland	Enkhuizen	Kadijken	1	Zeiler & Brinkhuizen 2011
7	North-Holland	Hoogkarspel		1	Van Vilsteren 1987
8	North-Holland	Hoogkarspel	Houterpolder	52	Aal et al. 2019
9	North-Holland	Hoogkarspel	Medemblikker Tolhuis (Hoogkarspel-Jong)	6	Suwijn 1981
10	North-Holland	Hoogkarspel	Medemblikker Tolhuis (Hoogkarspel-Oud)	2	Smits 1978
11	North-Holland	Hoorn	De Ark	1	Walch 1987
12	North-Holland	Medemblik		1	Walch 1987; 2000b
13	North-Holland	Medemblik	Medemblik-Schepenwijk II	8	Groot 2010
14	North-Holland	Velsen	Velsen Hofgeest-Rugbyveld	1	Marinelli 1991
15	Noord-Holland	Velsen-Noord	Pen Noorderweg	1	IJzereef et al. 1992
16	North-Holland	Venhuizen	Voetakkers	1	Aal et al. 2019
17	North-Holland	Westwoud	Markerwaardweg	14	Aal et al. 2019
18	North-Holland	Zwaagdijk		2	Walch 1987
19	North-Holland	Zwaagdijk-Oost	Bedrijventerrein Zwaagdijk-Oost	1	Halici & Buitenhuis 2003
20	Utrecht	De Meern	LR57-Burgemeester Middelweerdbaan	6	Meijer 2009
21	South-Holland	Berkel en Rodenrijs	Berkel	1	Walch 1987; 2000b
22	South-Holland	Lisse		1	Walch 1987; 2000b
23	South-Holland	Molenaarsgraaf	Schoonrewoerd	3	Walch 1987
total				**123**	

Table 1. Overview of known Dutch Bronze Age sites with elk finds.

(appendix 1). Many of these stem from Bronze Age settlement sites, and one region stands out in particular: West-Frisia, North-Holland (table 1, fig. 1). It is unclear why this period – and this region – account for the majority of elk finds, but multiple factors should be considered, such as excavation techniques, research bias, preservation conditions, and palaeoenvironment. The sheer number of elk finds from Bronze Age West-Frisia, however, suggests that the agency of both humans and elk also played a significant role.

While most elk remains are incidental finds and therefore difficult to interpret, three similar and remarkable elk depositions have been discovered at two Bronze Age sites in West-Frisia. All three concern elk heads – or rather, parts of them. These were found in two ditches, excavated at Medemblik-Schepenwijk II, and in a well, excavated at Houterpolder. One of the ditches contained a partial skull with fragments of both mandibles, and the other a partial skull of which the antlers had been shed (Groot 2010). The well contained

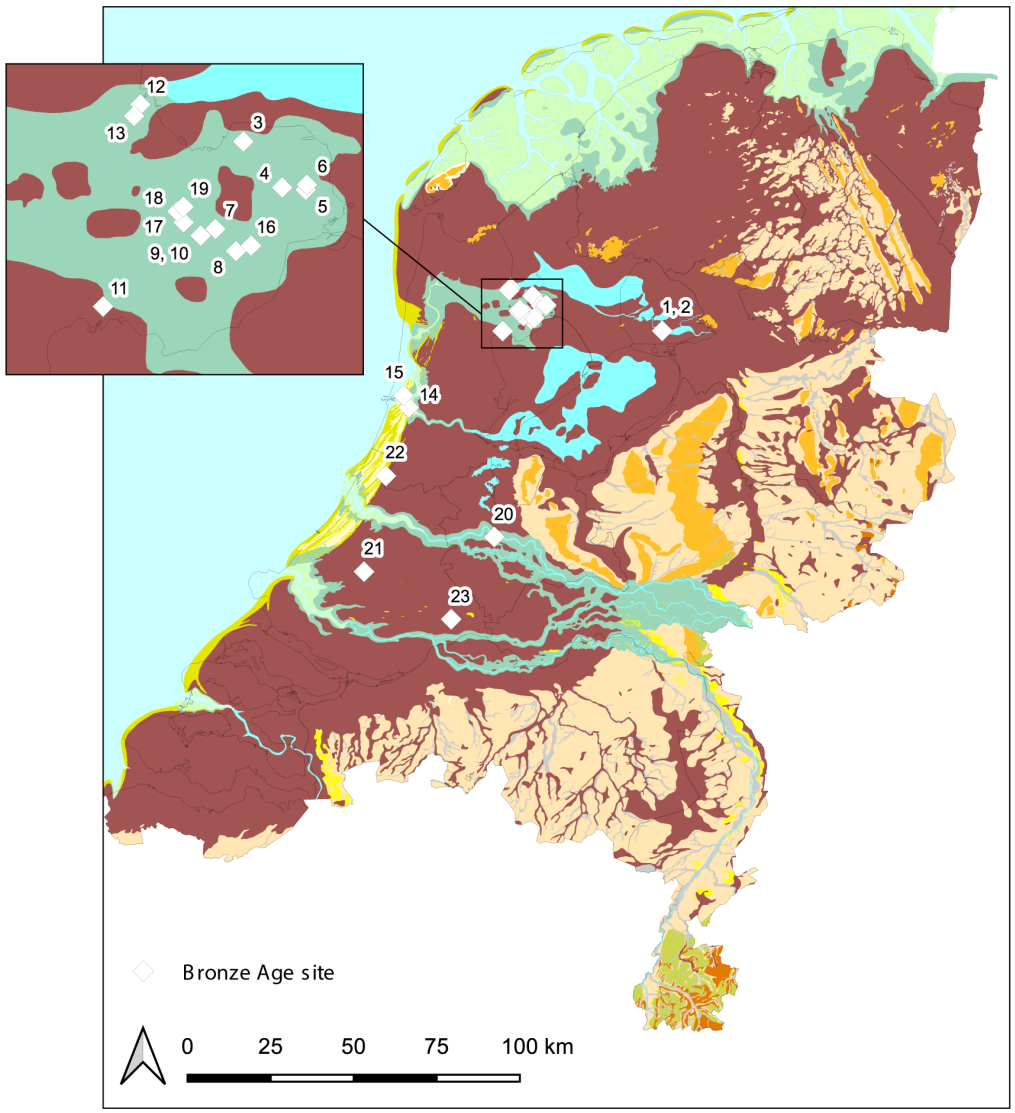

Figure 1. Map of known Bronze Age sites with elk finds (site numbers correspond to table 1) (source: Archeoplan Eco/BAAC/Leiden University).

a partial skull of which the antlers had been chopped off. The skull contains two other noteworthy butchery marks: the frontal bone shows signs of blunt force trauma, indicating that the elk had been hit on its head, and cut marks at the base of the skull, showing that the carcass had been purposefully decapitated (Aal et al. 2019).

As interesting as the three elk heads are, the *pièce de resistance* is the find of three young elk skeletons, deposited in a Middle Bronze Age well at Houterpolder (fig. 2) (Aal et al. 2019; Esser et al. 2019). They date between 1516 and 1402 BCE. Two large grinding stones were also uncovered, located at the bottom of the well (Knippenberg 2019). The biography of the well was not analysed, and it is therefore unclear whether the three elk skeletons (and the grinding stones) were deposited all at once or during separate occasions. There are no

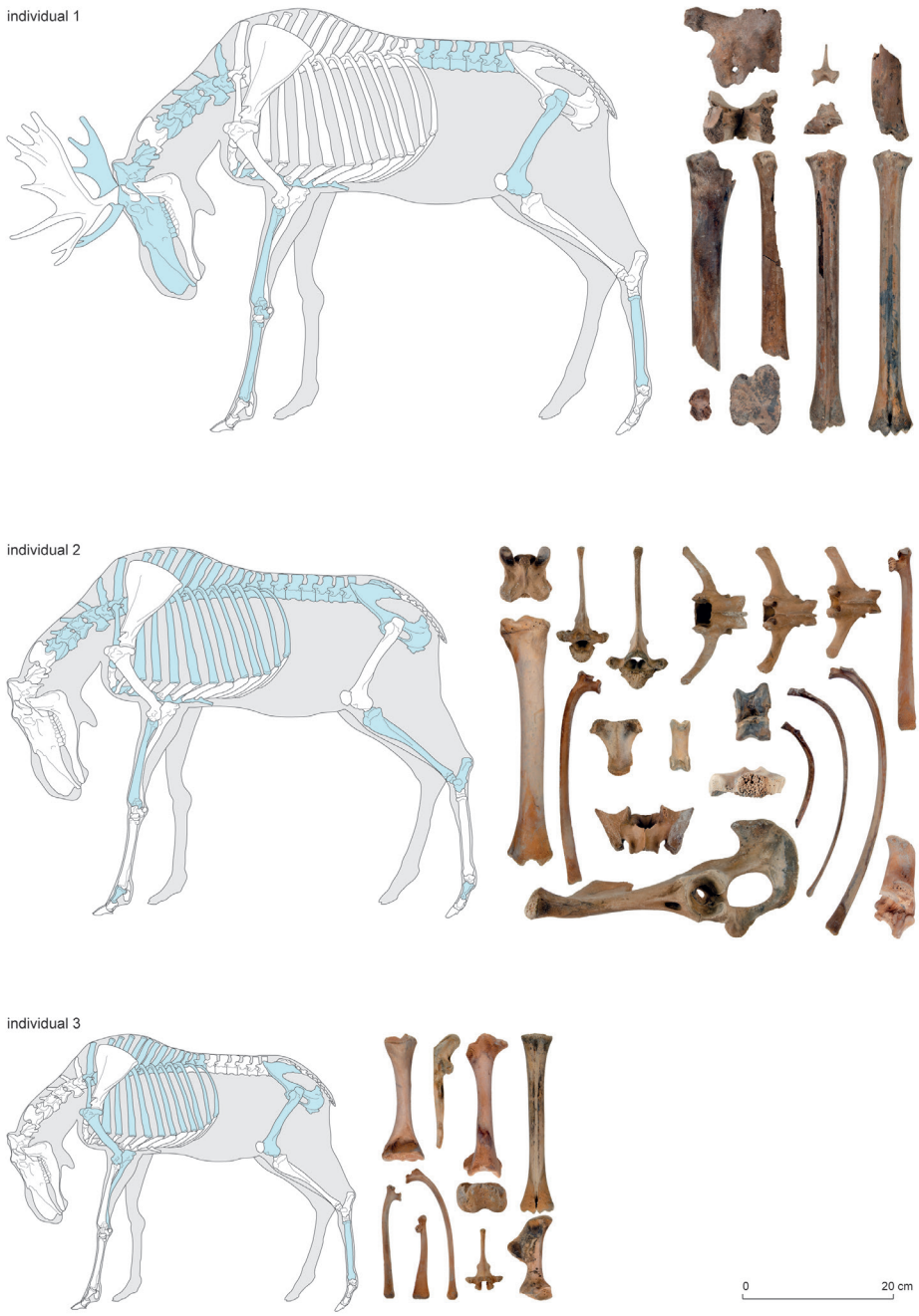

Figure 2. Three young elk skeletons found in a Middle Bronze Age well at the site Houterpolder (source: Archeoplan Eco/BAAC/Leiden University).

photos or drawings of the finds *in situ*. All that is known is that one individual (no. 1) was found at the top of the well and the other two individuals (no. 2 and 3) at a lower level. Figure 2 shows that all three elk skeletons are incomplete. Considering the distribution of skeletal elements and body parts, it is highly likely, however, that the three carcasses were

deposited in the well whole. Since the well was excavated mechanically instead of by hand, not all remains were collected. The three skeletons show no clear signs of butchery.

All three elks were very young, as indicated by the development of their skeletal elements: the oldest individual (no. 1) would have been around 24 months old, the middle (no. 2) around eleven months old, and the youngest (no. 3) not even six months old – possibly just weeks or months old (Habermehl 1985, 63-68). This age discrepancy is very striking, seeing as the gestation period of elk lasts about eight months (Schwartz et al. 1994). All three individuals could – in theory – have had the same mother. The results of the aDNA research revealed that the oldest individual (no. 1) is male and the other two individuals are female. If the three elks were siblings (or otherwise closely related), it could have major implications for the role of elk in Bronze Age West-Frisia.

The significance of elk

Bronze Age societies in the Netherlands were farming societies with a particular emphasis on cattle husbandry, although they continued to hunt a diversity of wild animals, especially in West-Frisia (Van Amerongen 2016). At most sites, only a small number of elk remains have been discovered – originating from various body parts, not just antlers. These remains quite frequently have butchery marks. Therefore, it is likely that elk was hunted for its resources, albeit not contributing significantly to the overall subsistence economy in this period. Their prevalence in this period is noteworthy, however, especially in comparison to northern European countries. In Scandinavia, the eastern Baltic, and western Russia, elk are most common in Mesolithic faunal records and remain common in the Neolithic but decline in number thereafter (Mantere 2023).

In these regions, elk are considered to have had a symbolic role in prehistory, particularly in the period 7000-3000 BCE (Bridault 1992; Mantere 2023). Pendants made from elk teeth are known from Mesolithic graves and camps (Bridault 1992). Elk are prevalent in Mesolithic and Neolithic rock carvings and paintings, being one of the most depicted motifs in eastern Norway and northern Sweden (Bolin 2000; Mantere 2023). They are often depicted as merging with boats and humans, suggesting their close connection to humans and waterways (Bolin 2000). Elk material culture from ca. 7000-1500 BCE also abounds in northern Europe in the form of elk-headed staffs (which are also depicted in rock art), clubs, axes, daggers, combs, and boat prows, elk figurines, and elk-shaped vessels (Mantere 2023; Zhulnikov & Kashina 2010) (fig. 3).

There is no similar evidence for elk symbolism in the Dutch Mesolithic or Neolithic. However, there is no rock art in the Netherlands and very limited prehistoric animal-related material culture. Faunal records therefore provide our only insight into an animal's significance. Elk comprise a very small percentage of fauna at Mesolithic and Neolithic sites, despite these sites being situated in environments ideal for elk. This led Hussain and Brusgaard (2023) to speculate that elk hunting may even have been largely avoided. Mantere (2023) proposes that in northern Europe, the elk's symbolic and economic importance declined in the period 2000-1200 BCE, when it was replaced in Nordic cosmology by other animals, such as horses. It is therefore especially noteworthy that the Dutch Bronze Age is the 'peak' of elk exploitation.

While this may signify an economic choice, there may have been another reason why elk became important in farming societies: they can be tamed and used as livestock.

Figure 3. Swedish rock art depicting elk and boats with elk-headed prows and an elk-headed Neolithic stone axe from Sweden (top photo by Henrik Sendelbach and bottom photo by Sören Hallgren).

Despite their solitary and somewhat shy nature, elk are reasonably easy to tame, as evidenced by abundant historical and ethnographic accounts of tame elk and domestication experiments (e.g. Chisholm 2019; Sipko et al. 2019). Russian rock art, dating from the Stone Age to the Iron Age, provides prehistoric evidence of tame elk, depicting elk in harness-like contraptions and some even towing a person (Sipko et al. 2019).

Figure 4. At the Sumarokovo Moose Farm (Russia) a calf is being replaced by a dairywoman a few hours after birth (top), after which the calf will bond with their new human mother (bottom) (Sumarokovo Moose Farm 2025).

Russian domestication experiments and modern moose farms provide detailed accounts of how elk can be tamed and kept (Dzhurovich et al. 1984; Sumarokovo Moose Farm 2025). Just after a tame elk cow gives birth, a 'dairywoman' distracts the cow by milking her while someone else removes the calf (fig. 4). The dairywoman thereby replaces the calf, and, in time, the elk will behave as a mother towards the person, allowing her to milk her and even defending her from perceived threats. Meanwhile, the calf will become attached to his or her new human 'mother', following them and drinking bottled milk from them. Elk are kept semi-free, being allowed to range from the farm, which prevents captivity stress (Dzhurovich et al. 1984; Sumarokovo Moose Farm 2025). The Sumarokovo Moose Farm (2025) states that "we don't see any behavioral difference between an orphaned calf brought from hunting ranges and a 6-7 generation

calf born on the farm". However, Sipko et al. (2019) note from other Russian experiments that after decades of breeding, elk show changes associated with domesticated animals, such as increased fecundity and atypical coat colours. Tame elk are therefore perhaps best likened to reindeer, a species whose relationship with humans also challenges the concept of domestication (cf. Salmi 2023).

In virtually all publications on Dutch Bronze Age sites (table 1), the presence of elk is interpreted as the result of hunting for economic purposes, as are the finds of other wild mammals. Many archaeologists assume that, after the adoption of farming, wild animals no longer had any symbolic significance. Yet, even among modern farmers, wild animals have diverse meanings not limited to just prey-predator relationships (e.g. Lescureux & Linnell 2010). Furthermore, the Bronze Age was a period of changing human-animal relationships, in particular more intensive human-cattle relationships (Brusgaard et al. 2019). Certain wild animals may also have attained new roles in society. It is possible that elk had a special significance in prehistoric farming societies because they were a liminal animal. They could be hunted but also tamed and then used as pack and draught animals, ridden, and provide milk. Elk could essentially fulfill all the same roles as Bronze Age livestock. They were in between the wild and domestic. This combination of features is also visible in the well found in West-Frisia: a deposit of 'wild' animals together with 'domestic' grinding stones (Knippenberg 2019). Seen in this light, the three young elks may have been bred or captured to be tamed, during which they died or were sacrificed.

Conclusion

The examples of elk depositions in West-Frisia imply a – as of yet undervalued – symbolic significance of elk in this region during the Bronze Age. The placement of three young elks in a well, in combination with two grinding stones, is unique. Multiple studies show that deposition practices in West-Frisia occurred in myriad forms and contexts, containing a wide variety of both animal and human remains, as well as other finds (e.g. Groot & Habermehl 2022; Roessingh & Baetsen 2024). These practices are, however, still poorly understood; mostly because many depositions are only discovered post-fieldwork, when the finds are being studied. A careful reconstruction of the lifecycle of specific features, such as wells, can provide important insights into their use and deposition practices (Van Haasteren & Groot 2013). We therefore strongly urge a re-evaluation and revision of the current (coarse) excavation techniques practiced under the Valetta Treaty, as they are insufficient for answering new and more high-resolution questions about the past.

These questions include what the economic *and* social role of wild animals was in farming societies. The high number of elk finds in the Dutch Bronze Age and depositions of their remains indicate that these animals held a special place in Bronze Age society, which was unique in comparison to other prehistoric periods. While elk were undoubtably exploited economically, their significance went beyond this. Based on historical and ethnographic evidence, elk may have had a liminal role – sometimes hunted animal, sometimes tamed livestock – in Bronze Age society, at least in the region of West-Frisia. This remains speculative as we currently do not have the data to determine whether the elk from the Bronze Age were tame or wild. Establishing the young elks' kinship relationship could elucidate this in the future. Regardless, we argue that it is

important to consider this possibility as it provides a wholly different perspective on wild animals found at prehistoric farming settlements. Furthermore, it also provides an interesting perspective for considering the social process of taming, keeping, and domesticating other animals.

Acknowledgements

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Appendices

Appendix 1. Overview of the number of known elk finds in the Netherlands.

Period	total	number of skeletal elements	number of antlers	number of artefacts
Palaeolithic	2		2	
Mesolithic	6	2	2	2
Mesolithic/Neolithic	18	12		6
Neolithic	72	60	6	6
Bronze Age	115	85	27	3
Bronze Age/Iron Age	8	7		1
Iron Age	24	19		5
Iron Age/Roman Period	2	2		
Roman Period	33	26	3	4
Roman Period/Medieval Period	2	2		
Medieval Period	38	22	4	12
Medieval Period/Modern Period	41			41
Modern Period	2		1	1
Unknown	344	146	104	94
Total	**707**	**383**	**149**	**175**