



“If you go into the woods...” A summary of a faunal assemblage, including brown bear (*Ursus arctos*), recovered from Hallowe’en Rift, Mendip Hills, Somerset, UK

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Abstract: Excavation for speleological purposes is an intrusive process and as such it is vital that sediments and other deposits contained within caves are recognized, recovered where necessary, fully recorded and reported so that information about them is not lost and can be disseminated allowing for further research. During the ongoing excavation and exploration of Hallowe’en Rift, Mendip Hills, Somerset, a faunal assemblage has been recovered comprising steppe bison (*Bison priscus*), brown bear (*Ursus arctos*) and ?horse (*Equus ferus*). The assemblage is consistent with those found from nearby sites, such as Hyaena Den and Rhinoceros Hole, and taken together with U-series dating of speleothems suggest a Mid-Late Devensian date, MIS 3, c.59 – 24 ka. A Pleistocene date for the faunal assemblage recovered from Hallowe’en Rift further extends the list of ice-age mammalian faunas found in Mendip cave sites.

Keywords: Glacial; interglacial; mammal assemblage-zone [MAZ].

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Introduction

Hallowe’en Rift (Fig.1), at British National Grid coordinates ST 5353 4811 and altitude 148m above Ordnance Datum (aOD), is located in a wooded hillside lying to the northeast of the Wookey Hole Cave ravine (Mendip Hills, Somerset). Excavation of the cave was commenced in 1982, but by the end of the 1980s interest at the site had waned. Then, in the early 1990s, activity in the cave re-commenced briefly until interest, once again, waned as the participants moved onto pastures new. In 2009, the current phase of activity began, with this phase of work concentrated on

expanding the cave to the east-side of the entrance where significant discoveries were made in 2018. Exploration and investigation of Hallowe’en Rift remain ongoing projects and several potential leads, currently in the Soft South area, are being actively pursued (2024). The cave consists mostly of low passages, either partially or completely filled with sand, silt and clay containing cobbles and boulders of dolomitic conglomerate and common fragments of speleothem, including stalagmite, stalactite, and flowstone. The accessible low passages trend generally northeast/southwest, locally intersecting rifts that are aligned northwest/southeast.

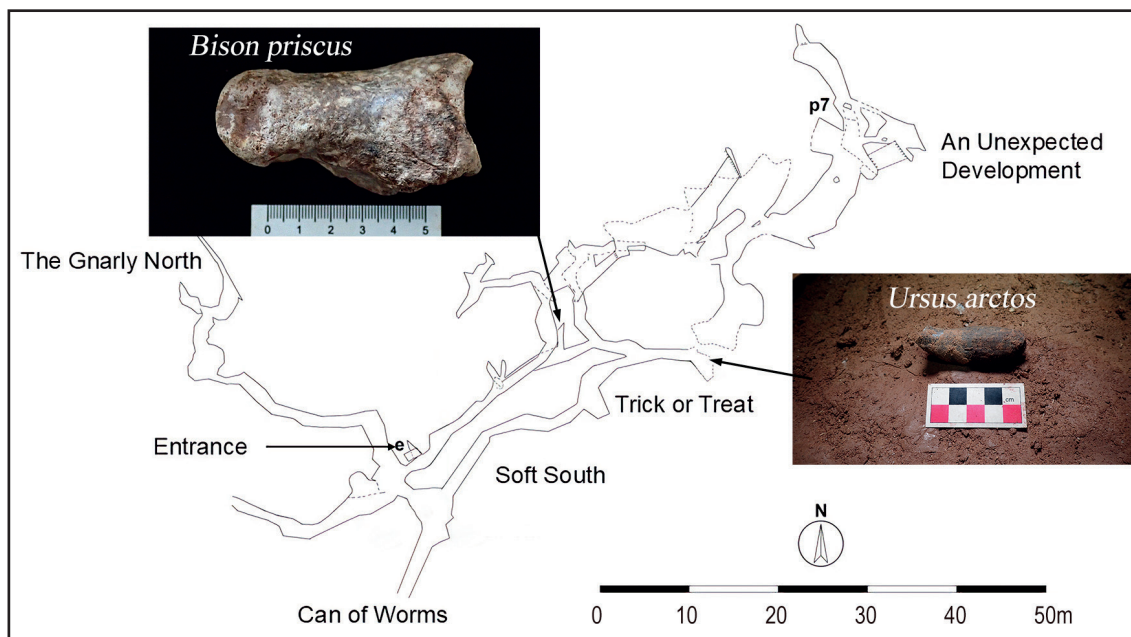


Figure 1:
Survey plan of Hallowe’en Rift, showing the known locations of faunal remains. Survey to BCRA Grade 5c by D Price, R Taviner, and V Simmonds (latest update August 2024).

During a 2011 excavation along a lower passage, known as ‘Toil and Trouble’, a single animal bone was recovered from the fine sediments. Subsequently the bone was identified as a *Bison priscus* 1st phalanx (*fide* Professor Danielle Schreve [University of Bristol] *personal communication*). The bone was submitted for radiocarbon age determination but, unfortunately, the dating was unsuccessful because the sample contained insufficient collagen (Simmonds, 2021).

Elsewhere in the cave, excavations continued and, in 2024, efforts were concentrated upon pursuing a large fossil passage trending northeast/southwest. At its northeastern extent the excavation intersected a previously discovered section of the cave known as ‘Trick or Treat’, and the area beyond was now further extended by continuing excavation. Currently the passage trends eastwards, sloping downwards at about 25 degrees. Whilst bags of spoil were being emptied following a digging session, several mineralized ‘bone’ fragments were recovered (later identified as ?horse). This discovery prompted a closer inspection of the excavation area, leading to the potential source of the ‘bones’ being located. Following on from the initial find, this area was carefully excavated, and additional faunal remains were recovered from a ‘naturally-disturbed’ sediment deposit underlying a calcite flowstone ‘floor’ (now degrading). This calcitic layer was, in turn, overlain by a thick (c.0.60m) deposit of banded/ laminated fine sediments comprising mostly sand, silt, and clay. At this location these deposits fill the cave passage to its roof. Where they have now been exposed by excavation, the conglomerate walls and ceiling are adorned with a variety of speleothems including curtains and drapes, stalactites, helictites, straw stalactites.

Faunal remains

The majority of the faunal remains so far recovered from the excavation of Hallowe'en Rift consist of brown bear (*Ursus arctos*), comprising a sub-adult and an adult (*fide* Professor Danielle Schreve, *personal communication*). As mentioned above, a fragment of mineralized bone recovered from the spoil heap is probably of wild horse (*Equus ferus*) although the recovered fragment is small.

Element	Number
Epiphysis (unfused)	3
Phalanx	26
Podial	20
Tarsus	3
Carpus	1
Tooth	6
Vertebra	3
Astragalus	1
Calcaneus	1
Humerus	1
Scaphoid	1
Total number of identified elements:	66

Table 1: Number of identified elements (*Ursus arctos*) recovered from Hallowe'en Rift, beyond Trick or Treat up to the end of 2024, when excavation was postponed due to adverse conditions.

The brown bear remains that have been recovered so far consist mostly of ‘foot’ bones (phalanges, podials, tarsals/ carpals, etc.), but they also includes some vertebrae and dentition. The smaller sizes of these faunal remains suggest these have not been transported any distance and are more indicative of an in-situ assemblage and likely to be close to their life/death position, perhaps, speculatively, a mother and cub perishing in hibernation. There is no evidence for carnivore gnawing on any of the faunal remains so far recovered.

The assemblage does, however, suggest that there was an opening to the surface somewhere nearby. There are a number of thoughts to be considered: the faunal remains were found within a sandy deposit with common fragments of flowstone (perhaps related to frost/ice damage?), and subsequently sealed by calcite deposition. For this process to have occurred the cave passage must have been more open than it is at present, to allow access for bears and perhaps other mammals as yet undiscovered, and for it later to be sealed by calcite precipitation.

Currently, human access into the cave is through a narrow, blasted fissure opened during the early 1980s; it is thought unlikely that any larger mammals entered via this route. Therefore, access must have occurred through another, as yet undetermined, route. Subsequent to this ‘open’ phase, the cave then becomes filled with finer sediments over an undetermined time period. A layer of red-brown clay covering the calcite floor is the primary fill, followed by a hiatus as a thin grey silt was deposited. In turn this is overlain by a composite deposit consisting of laminated/banded grey silt and red clay in fining upwards sequences (known as rhythmites), laid down with obvious periodicity and/or regularity. Permafrost conditions on Mendip during the Pleistocene Epoch are thought to have penetrated to significant depth in Hallowe'en Rift, with subsequent periods of thaw reaching lesser depths, resulting in a deep impervious ice-plug causing meltwater to be trapped and ‘ponded’. The ponded meltwater ‘topped up’ by the ingress of surface-derived water, probably reflecting seasonal changes (Simmonds, 2024). The ‘pulsing’ movements of the water resulting in sedimentation of the layered sediment deposits encountered.

Bears in [Mendip] caves

Excavations by the Natural History Museum in the 1970s at Westbury Quarry discovered an abundance of mammal bones including the extinct Deninger’s bear (*Ursus deningeri*) in deposits laid down during the early Middle Pleistocene, c.620 ka. In Britain, *U. deningeri* was replaced by the Cave bear (*Ursus speleaus*) after the Anglian glaciation, c.480–423 ka. which, in turn, was replaced by the brown bear (*Ursus arctos*) appearing during MIS 9, c.339–303 ka. Faunal remains of brown bear are relatively common in cave assemblages throughout the British Middle and Late Pleistocene during both warm and cold stages. Its presence in Britain in association with herbivores of cold open landscapes (woolly mammoth, woolly rhinoceros, and horse), as well as with those of temperate conditions, shows it to have been adaptable to a range of environments. Brown bears have evolved a generalist omnivore strategy; foraging for plants, tubers, berries, scavenging carrion, and preying on small mammals, and weak, older ungulates, and their calves. Temperature and snow conditions are reported to be the most important factors determining the composition of brown bear diet (Scott and Buckingham, 2021). Where it is still extant today the brown bear occupies a wide variety of habitats from tundra to temperate forests.

With general regard to Mendip cave sites, brown bear (*Ursus arctos*) is recorded as part of the mammal fauna assigned to the Joint Mitnor Cave mammal assemblage-zone (MAZ), Marine Isotope Stage (MIS) 5e, c.128–116 ka, a faunal assemblage consistent with this MAZ was recovered from the nearby Milton Hill Quarry. Banwell Bone Cave MAZ (initially believed to correlate closely with the Early Devensian, c.71–59 ka, and formerly assigned to MIS 4) is assigned to MIS 5a, c.83–71 ka. Within the Banwell Bone Cave MAZ, the remains of *Ursus arctos* appear to represent a larger form of the species. Brown bear has also been recorded from the Lower Cave Earth deposits at Pin Hole, Creswell Crags, Derbyshire and, therefore, listed as part of the Pin Hole MAZ, Middle Devensian, MIS 3, c.59–24 ka.

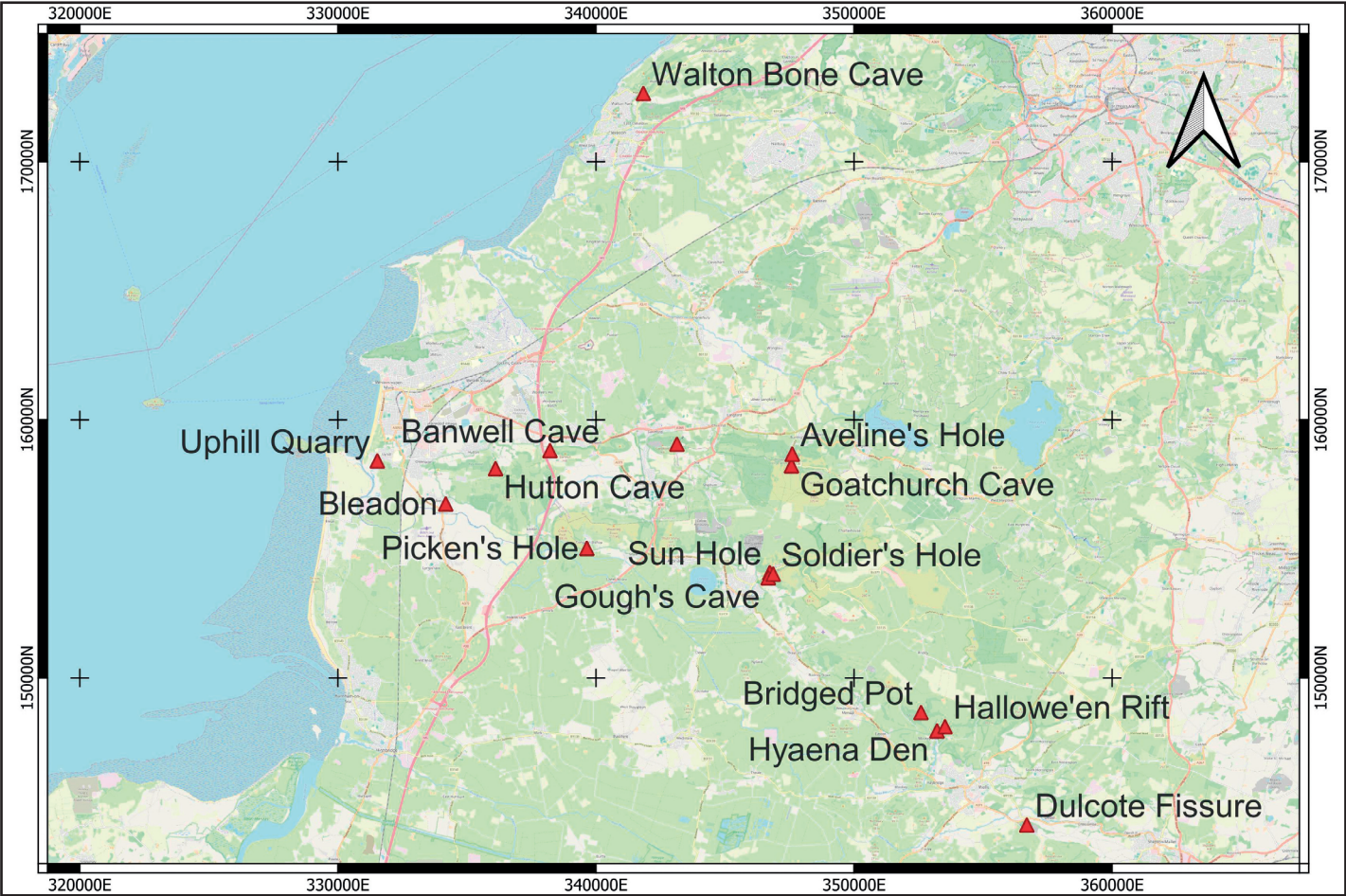


Figure 2: Mendip (and nearby) caves with faunal deposits containing remains of brown bear (*Ursus arctos*) (see Table 2). [Map base ©OpenStreetMap contributors (2015) Planet dump — accessed 15/12/24].

The Pin Hole MAZ also includes steppe bison (*Bison priscus*) and wild horse (*Equus ferus*). Mendip sites with faunal assemblages attributable to the Pin Hole MAZ include sites near to Hallowe'en Rift at Hyaena Den and Rhinoceros Hole at Wookey Hole, and farther afield at Picken's Hole near Compton Bishop, and Uphill Quarry in North Somerset (Jacobi and Currant, 2011). It is likely that the Hallowe'en Rift faunal assemblage comprising brown bear, steppe bison and wild horse can be attributed to the Pin Hole MAZ and was deposited during the later stages of MIS 3. Brown bear also occurs in deposits attributable to the Gough's Cave MAZ, MIS 2, c.12.9–9.9 ka (Currant and Jacobi, 2001) in Cheddar, Somerset.

Site (Mendip Hills area)	NGR (ST)	Age	Age (ka BP)
Bleadon	3418, 5674	MIS 7	245–186
Hutton Cave	3611, 5811	MIS 7	245–186
Picken's Hole	3965, 5502	MIS 5a and MIS 3	c.83–24
Banwell Cave	3822, 5881	MIS 5a	c.83–71
Goatchurch Cavern	4758, 5822	Devensian	116–11.55
Hyaena Den	5322, 4795	MIS 3	59–24
Sandford Hill	4314, 5906	MIS 3	59–24
Dulcote Fissure	5670, 4430	Devensian	116–11.55
Uphill Quarry	3153, 5841	MIS 3	59–24
Sun Hole	4674, 5408	12,378 BP	—
Gough's Cave	4668, 5388	c.12,200 BP	—
Soldier's Hole	4687, 5402	Late Glacial	24–11.55
Bridged Pot	5260, 4866	Late Glacial	24–11.55
Walton, Clevedon	4184, 7265	Late Glacial	24–11.55
Aveline's Hole	4761, 5867	Late Glacial	24–11.55

Table 2: Recorded occurrences of brown bear (*Ursus arctos*) at other archaeological sites in the Mendip Hills area. The dating of most of the records is indirect (adapted from Yalden, 1999, Table 4.3, pp.113–115).

Dating

Examples of speleothems found in Hallowe'en Rift have been sampled, and uranium-series dating of the material has been carried out. The results obtained span MIS 15–13, MIS 7c, MIS 5e and MIS 3 with the youngest date currently recorded at 51.26 +0.31 –0.32 ka (Simmonds, 2019). The spread of dates suggests that the passages in Hallowe'en Rift were open for long periods during the Early to Late Pleistocene, before becoming filled with sediment. Deposition began during the latter part of the Pleistocene, and has probably continued throughout the Holocene.



Figure 3: Example of bone material recovered in Hallowe'en Rift: unfused epiphysis of brown bear (*Ursus arctos*). [Photographs are by Vince Simmonds, unless stated otherwise.]



Figure 4:
Example of bone material recovered in Hallowe'en Rift: phalanges of brown bear (*Ursus arctos*).



Figure 5:
Example of bone material recovered in Hallowe'en Rift: metapodials of brown bear (*Ursus arctos*).



Figure 6:
Example of bone material recovered in Hallowe'en Rift: adult canine tooth of brown bear (*Ursus arctos*).

During January 2025, an application for funding to support radiocarbon dating was accepted by the British Cave Research Association (BCRA) Cave Science and Technology Research Fund (CSTRF). A sample, consisting of a partial canine tooth, was selected and submitted for analysis.

Unfortunately, the sample failed to provide a result because it contained insufficient collagen, which made it unsuitable for radiocarbon dating. Such a lack of collagen might be a reflection of one or more factors. For example, the age of the sample might lie at the limits of radiocarbon dating (c.50 ka), or the sample might have been affected by mineralization. It is hoped that another, hopefully more suitable, sample might be found and sent for radiocarbon dating in the near future.

The faunal assemblage from Hallowe'en Rift, comprising steppe bison (*Bison priscus*), brown bear (*Ursus arctos*) and ?horse (*Equus ferus*), is consistent with those assemblages recovered from nearby sites, including Hyaena Den and Rhinoceros Hole, that have been attributed to the Pin Hole MAZ, Middle Devensian, MIS 3, 59–24 ka.

In the absence of confirmation by chronometric dating, a Middle Devensian origin is suggested for the Hallowe'en Rift faunal assemblage including *Ursus arctos*.

Comments

In Britain, as also elsewhere, faunal assemblages recovered and identified from cave sites are a valuable resource. They provide useful information and add to the understanding of past environments and how organisms adapted to climatic fluctuations between (cold) glacial periods and (warmer) interglacial stages. A Pleistocene age for the faunal assemblage recovered from Hallowe'en Rift further extends the list of ice age mammalian faunas reported from Mendip cave sites.

Inevitably, excavation of caves for speleological purposes is an intrusive process. As such, it is vital that sediments and other deposits contained within caves, in this case faunal remains, are recognized, recovered where necessary, fully recorded, and reported. This insures that information about the deposits is not lost and can be disseminated widely and so contribute to further research.

Acknowledgements

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In addition, access to and use of base map data © OpenStreetMap contributors, available from:

<https://www.openstreetmap.org>

are gratefully acknowledged.

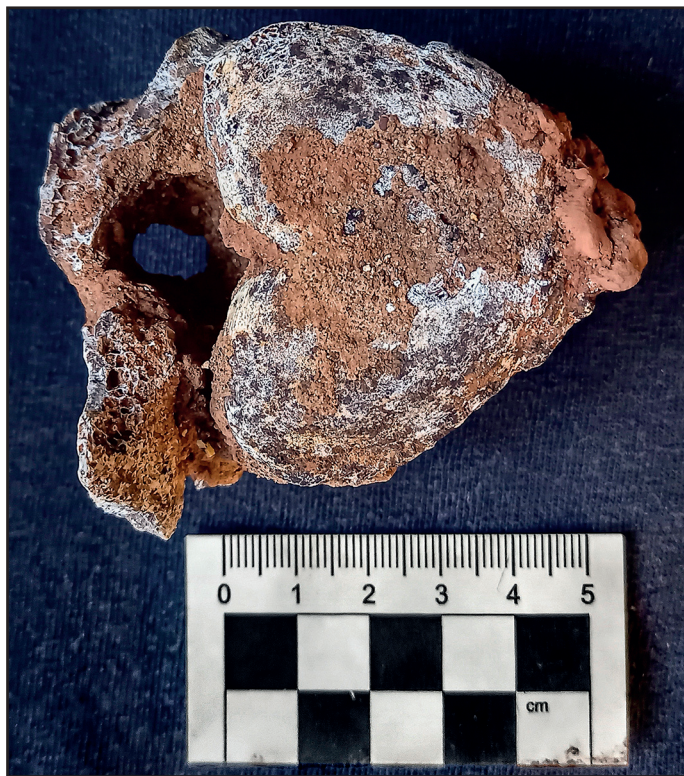


Figure 7:
Example of bone material recovered in Hallowe'en Rift: mineralized lumbar vertebra of brown bear (*Ursus arctos*).

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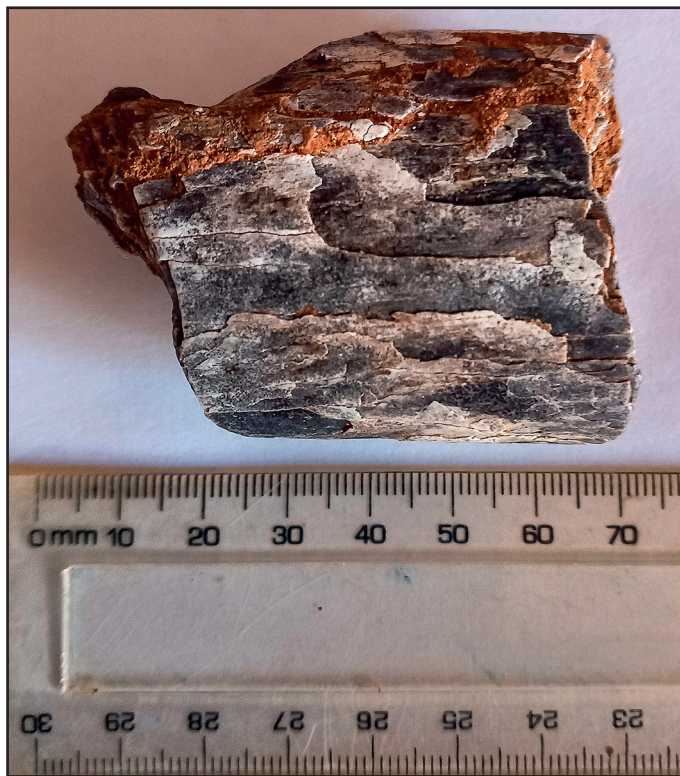


Figure 8:
Fragment of a long bone – ?horse (*Equus ferus*) – recovered from Hallowe'en Rift. [Photographed by Jon Riley: 03/08/2024.]

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