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Front cover: Drawing of European Beaver by Africa Gómez

Back cover: Finds from the VC65 YNU Excursion being scrutinised by Derek Whiteley and Judith Allinson. *Photo:* Joyce Simmons

Beavers in Holderness and the Hull Valley

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Introduction

The Eurasian Beaver, *Castor fiber* (Fig.1 and Front Cover), is the largest European rodent species and is strongly associated with riparian habitats. Their tree felling, dam and lodge building, and channel-digging activities make them ecosystem engineers. They provide a range of ecosystem services, attenuating peak water flow, increasing lateral connectivity in watersheds, and increasing habitat complexity and biodiversity (Brazier 2021) (Figs.2&3, p82).



Figure 1. Beaver swimming. Photo: P. Simmons

Since postglacial times, Beavers had been widely distributed in Britain. However, persecution for their meat, pelts and castoreum resulted in their extinction. Although by the 1600s, Beavers were probably extinct in England, Wales and Scotland (Wilson *et al.* 2020), the exact date of extinction is debated. Beavers are regarded as a keystone species, that is, an organism with a large ecological impact on their environment, and their reintroduction has been encouraged to facilitate nature recovery in the UK (website reference 1). In the last couple of decades, Beavers have been reintroduced at many sites across Scotland, England and Wales. In England, many reintroductions have been into enclosures, although there are free ranging populations on the rivers Otter, Tamar, Wye, Avon (Bristol) and Stour (Kent), some resulting from illegal releases or escapes from enclosures (Heydon *et al.* 2021). Despite the acknowledged positive impacts in flood mitigation and biodiversity enhancement, conflicts with humans arise due to Beaver excavations in embankments, culvert blocking and felling of trees (Campbell-Palmer *et al.* 2016). Beaver reintroductions must therefore be accompanied by management plans to mitigate their negative effects (see for example, Campbell-Palmer *et al.* 2015).



Figure 2. Beaver Dam, Cropton. Photo: A.Gomez



Figure 3. Gnawed Beech, Cropton. Photo. A. Gomez

Since 2019, Forestry England has managed a successful reintroduction trial, licenced by Natural England, in an enclosure at Cropton Forest, North Yorkshire, where a pair was released with the aim to contribute to flood mitigation in the Vale of Pickering (Puttock *et al.* 2021). This pair has bred every year and their effects in the area have been closely monitored. The monitoring has shown extensive dam building creating ponds and channels in mud, and a general increase in habitat complexity and biodiversity. The Beaver-created structures are also slowing the flow of water through the site (Howe 2020; website reference 2). Due to the success so far, a further licence has just been granted to continue the trial until 2029.

The European Beaver has a long history in East Yorkshire, with both archaeological finds and toponym links (e.g. the name Beverley thought to originate from the name for Beaver). However, this history has not been reviewed since a short article by Sheppard (1903) and the excellent book by Coles (2006) as part of her UK-wide review. Given the recent attention Beaver reintroductions have attracted and new archaeological research, this paper examines the historical and archaeological evidence and context for the Beaver as a native mammal in the low-lying ground of the River Hull valley and in the plain of Holderness to the east (Fig. 4). We also speculate on the advisability and practicality of reintroduction to this area of East Yorkshire.

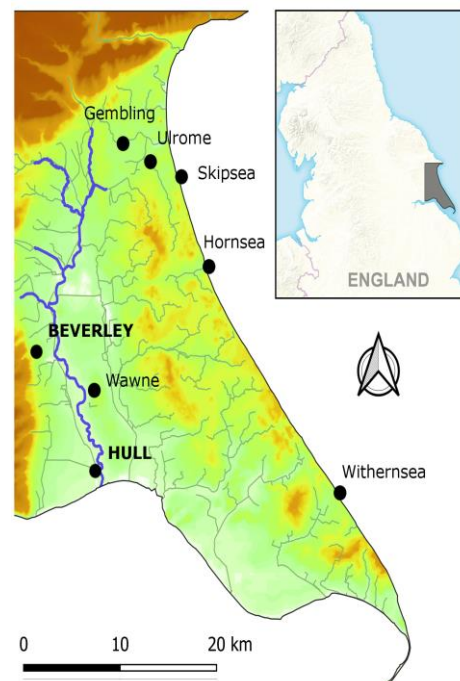


Figure 4. Location map. Contains Ordnance Survey Data © Crown copyright and database right 2024

Physical evidence

In post-glacial times, the River Hull catchment, with its abundance of water courses, meres and carrs, seems likely to have held Beaver populations. The earliest evidence for Beaver presence in the wider area of eastern Yorkshire is found in the Early Mesolithic material excavated from the celebrated Starr Carr site at the eastern end of the Vale of Pickering (Knight *et al.* 2018) (see Table 1 for a summary of East Yorkshire evidence); some of these specimens are held in the Museum at Scarborough.

Table 1. Evidence for Beaver in the East Riding of Yorkshire.

Site	Evidence	Age	Context	References
Star Carr	bones from about 12 individuals	Early Mesolithic	Archaeology	Knight <i>et al.</i> 2018
Wawne	Skull	none	none recorded	
Withernsea	Part of skeleton	none	none recorded	Sheppard 1903
Hornsea/Skipsea	Vertebrae and parts of the skull of a young individual	none	none recorded	Sheppard 1922
Painsthorpe Wold	Teeth	Neolithic	Archaeology	Mortimer 1892, 1905
Duggleby Howe	Teeth	Neolithic	Archaeology	Mortimer 1892, 1905
Langton	Teeth used as tool	Bronze Age	Archaeology	Greenwell 1877
Staple Howe	Scapula	Iron Age	Archaeology	King, 1963
West Furze, Ulrome	Jaws and limb-bones, worked timber	Neolithic/Early Bronze age		Van de Noort 1995
Gembling	Femur	possibly Mesolithic	Specimen not in situ	Buckland 2023
Skipsea Withow	Fur mass	Neolithic/ Early Bronze Age		Horne 2022
	Worked timbers, possible dam	Neolithic, 3670-3370 cal BCE, or 4770±70 BP pointed Alder 'stake' or 3771-3370 cal BCE Alder sample		Huntley 2020. Buckland 2023, citing Innes, J. 2002. Brigham, T. 2014
Fishergate, York	remains	8 th century	RC	O'Connor 1991

During the latter part of the 19th century, Beaver teeth were found, in a Neolithic context, by J R Mortimer (1892, 1905) during barrow excavations at Duggleby Howe and Painsthorpe Wold, on the Yorkshire Wolds north-west of Driffield. Another tooth, which had likely been used as a tool, had been found near Langton by Rev Greenwell (1877) in a Bronze Age context. More recently, an excavation of Staple Howe, an Iron Age farmstead on the Wolds edge overlooking the Vale of Pickering, yielded a Beaver scapula (King 1963). In view of their locations, it would seem most likely that these finds are the remains of animals taken from north and west of the Wolds rather than the Hull valley. Finally, a record of Beaver remains in an excavation at Fishergate, York (O'Connor 1991), indicates that the animal was still present in Yorkshire in the 8th century.

The first recorded discovery of Beaver remains in the Hull valley was made at Wawne in 1861, when a skull was found during drainage excavation near the river. The exact location or age is unknown, but Wawne parish is bounded on its western margin by the River Hull and lies only a few kilometres south east of Beverley. A borehole survey (Lillie & Gearey 2000) showed that biogenic sediments around Stone Carr, in the riverside area to the north of Wawne village, held potential for providing palaeoenvironmental evidence from the Mesolithic to the Neolithic and beyond. This skull was acquired by the Beverley surgeon Charles Brereton (1788 – 1872). It is unlikely, in view of his age at the time, that he uncovered it personally, and more probable that the workers involved brought him the specimen, knowing that he would be interested. He was a locally celebrated antiquarian who, through his profession and association with the Mechanics' Institute, would have been well known to many people of all classes. He was also reasonably affluent and would likely have been prepared to purchase such a specimen. Contemporary newspaper items show that in 1858/9 he had been lecturing on geology at the Mechanics' Institute and had an extensive collection of specimens. Having served as Mayor of the borough on three occasions between 1845 and 1857 the symbolic significance of the find, in relation to the Beaver links to Beverley, would not have been lost on him.

The first known recorded public airing of this skull was at the meeting of the Yorkshire Architectural Society at Beverley on 20 June 1865. Charles Brereton exhibited his specimen to 70 members as they partook of lunch at the Beverley Arms Hotel. He then read his paper on 'The Parish Church of St Mary's.' A more public exhibition was made at a meeting of the Geological and Polytechnic Society of the West Riding of Yorkshire (now the Yorkshire Geological Society), held in the Church Institute, Wakefield, on 28th April 1869. It was used to illustrate a paper 'Remarks on the extinct fauna of the East Riding of Yorkshire' written by Mr Edward Tindall (1814-1877) of Bridlington (Tindall 1870). This is the first place in which the circumstances of the discovery were outlined:

"- a very fine skull was exhumed during some extensive draining operations on the banks of a river near Wawne in the neighbourhood of Beverley in 1861 by Dr Brereton and who has kindly allowed the specimen to be exhibited at this meeting."

It is unlikely that the meeting was regaled with any further information about the skull as the paper was read, in Mr Tindall's absence, by Mr Denny, the Society's secretary. Henry

Denny (1803-1871) was the curator of the Leeds Philosophical and Literary Society's museum, which was later to become the Leeds Municipal Museum in 1921/2. The printed version of the paper, which appeared in volume 5 of the Society's Proceedings 1869-1870, also included a fine engraving of the skull in three orientations.

Edward Tindall was, by profession, a tobacco-pipe maker with premises in Bridlington. The link with Dr Brereton is not yet clear but they shared interests in both 'antiquarian' and charitable activities. Edward Tindall was born in Beverley but had lived in Bridlington with his family since at least 1845. He was an avid collector of geological and archaeological specimens and was considered by John Robert Mortimer (1825-1911), the noted Driffield archaeologist, to be one of his main inspirations, and a rival for the purchase of interesting archaeological finds. At his death in 1877, Edward's personal collection was considered one of the finest in the area. Edward Tindall bought advertising space in the first issue of Mackie's 'Geological and Natural History Repository' magazine (1865) for his 'Anthropological Museum' at 5 High Street, Bridlington, where he displayed his collection of flint implements and a few 'Fossil Molars of Elephants, and Horns of extinct Deer'. He also sold locally-sourced fossils.

Leeds Museum's records show that the Wawne Beaver skull was purchased by the Leeds Philosophical and Literary Society in 1872 but hold no further information on the circumstances (C. Brown pers. comm.)

After its 1869 airing, the existence of this Beaver skull seems to have largely vanished from public knowledge. It is telling that by 1881 Clarke & Roebuck dismissed the evidence for the occurrence of Beavers in Yorkshire as being "entirely etymological ...". In 1903 Harry Speight published a note in *The Naturalist* offering further circumstantial evidence that the Beaver had at one time been a part of the Yorkshire fauna and appealed for further information. He also suggested that the Corporation of Beverley may have a document which "proves the actual existence of the animal in that neighbourhood in the twelfth or thirteenth century ...". Thomas Sheppard (1876 – 1945), who was one of the journal's editors and the curator of the Hull Municipal Museum, responded to this in the same issue. He observed that Edward Tindall's 1869 paper had been overlooked by later authors, but he was clearly unaware of the current whereabouts of the specimen. Whether this appeal for information solicited other responses is unclear, but by 1909 Sheppard had discovered that the skull was in the Leeds Museum and was even able to present a plaster cast of the specimen to the Beverley Museum. It seems unlikely that he had not also obtained one for his beloved Hull Museum collection.

The infilled and drained meres along the Holderness coast have revealed further evidence of Beavers. In particular, the sediments of the complex of old meres, now all drained, in the vicinity of Skipsea, have been particularly productive. In 1880 substantial timbers and artefacts were revealed during the deepening of Skipsea Drain at West Furze, Ulrome. Thomas Boynton made a thorough excavation and interpreted the site as a lake dwelling of two phases, the lower using timbers cut by stone tools and the upper with metal. A bronze spear head was also associated with this upper level. Smith (1911) had access to the material

and sent bones from the excavation to Dr Andrews at the Natural History Museum. They proved to include Beaver jaws and limb-bones along with Dog, Pig, Red Deer, Sheep, Ox, Reindeer, Horse, Cormorant and wild duck. A more recent evaluation of the evidence, accompanied by new excavations (Van de Noort 1995), has interpreted much of the timber to be related to a trackway crossing a narrow mere. A fine illustration of this interpretation, by Les Turner, was used on the cover of *Wetland heritage of Holderness*, an archaeological survey (Van de Noort & Ellis 1995). It is tempting to suggest that pre-existing Beaver dams would have provided a suitable foundation for the construction of a causeway, indeed Beaver dams often make solid causeways (Coles 2006). In addition, Beaver-cut timbers have often been misinterpreted as human-made (Coles & Orme 1983).

Tom Sheppard (1903) notes that “a few years ago” part of a Beaver skeleton was discovered at Withernsea in the peat of the old mere revealed by the eroding shoreline. The find was made by Thomas David Pygas (c1867-1930) and was later displayed in Dr H. B. Hewetson’s private museum in Easington, but by 1903 its whereabouts was unknown. Tom Pygas, a cabman/labourer, is credited with several other vertebrate discoveries in this deposit which was, at the time, exposed on the sea shore near the pier. Sheppard (1922) records examining vertebrae and parts of the skull of a young Beaver (determined by E. T. Newton FRS), found in Holderness peat, then in the collection of Mr Cecil W Mason. Unfortunately, he does not make it clear whether they were from Hornsea or Skipsea.



Figure 5. Coastal exposure of Skipsea Withow Mere deposits, showing numerous timbers and brush embedded in the peat layer in July 2020.
Photo: A.Gomez.

More recently, evidence of past occurrence of Beavers has been found in the sediments exposed on the coast at the nearby Skipsea Withow Gap (Fig. 5). Here, coastal erosion has cut through peat which had accumulated in a now-lost mere. Excavations in 1993 revealed large amounts of timber, some showing clear signs of Beaver gnawing (McAvoy 1995).

Although describing this as a log-jam rather than a dam or lodge, it was thought that Beaver activity could account for the evidence of woodland management detected in the pollen record here. In 2017 there was a report of more tangible evidence from the Withow by Sheila Cadman with the discovery of a fur mass in the peat. This was later identified by the York Archaeological Trust as being that of a Beaver (S Cadman pers. com.). Further discoveries of fur have been made there since (Horne 2022).

Finally, and more recently still, a third site in this region has yielded Beaver remains. Buckland (2023) reported the discovery of a Beaver femur in a quarried kettle-hole at Park Farm, Gembling.

Documentary evidence

There is still some uncertainty concerning the date at which the Beaver became extinct in England. Raye (2015), by examining the manuscript references, makes a convincing case for it being before 1300 but somewhat later in Scotland. Manning *et al.* (2014) describe a Beaver-gnawed branch from Scaup Burn, Kielder Forest in Northumberland, which gave a radiocarbon date between 1269 and 1396 which may not be out-of-line with this assertion. Coles (2006) argues well for the survival of isolated colonies into the 18th century but admits that there is little firm physical or even documentary evidence. A persistently quoted candidate for the 'last Beaver in England' is to be found in the parish records of Bolton Percy, Yorkshire, where, in 1789, a bounty of two pence was paid for a "bever-head" (Speight 1903, Howes 2009). Since the going rate for a Fox or an Otter at that time was one shilling, the derisory payment seems to indicate a case of mistaken identity. However, it is not possible to refute the argument that it is a token payment for an animal proscribed as vermin in the 1566 'Act for the preservation of grain' and the low bounty reflected the Churchwarden's evaluation of its perceived pest value!

The use of Beaver landscapes by hunter-fisher-gatherer humans in the Mesolithic across Europe, with their clearings in the woods attracting game, and Beaver lakes holding large fish, is now well documented, with humans behaving as 'Beaver commensals' (Hussain & Brusgaard 2023). The close coexistence of both species, which include the use not only of the Beaver-made habitats, but also of beaver teeth and jaws as tools and Beaver-felled timbers for human use, might confuse the attribution of Beaver-made structures. Progression to an agrarian economy in the Neolithic would first make use of already cleared land near Beaver areas and use 'Beaver meadows' for crop cultivation and husbandry (Coles & Orme 1983), subsequently tending to marginalise the animal and restrict it to the more remote areas unsuitable for agriculture and settlement (Hussain & Brusgaard 2023). Although the low-lying parts of Holderness may be imagined as such, English (1979) observes that by 1086 the Domesday returns show that the present-day pattern of settlement had already been largely established and was often densest in the areas with abundant meres.

Despite this, there has long been the local belief that the Beaver once formed a part of the Hull valley fauna. This was, no doubt, largely fostered by the seemingly obvious name of East Yorkshire's county town. The medieval town of Beverley was built on drier, gravelly land

overlooking the River Hull and situated almost on the line of the Ipswichian shoreline where a spring-fed stream, later enlarged into the navigable Beverley Beck, afforded access eastwards to the river. An early documentary reference to the Beverley area comes from Bede's Ecclesiastical History (Miller 1890) where he describes St John (of Beverley, then the Bishop of York) as establishing a religious centre at "In Dere Wuda" (in the wood of the Deiri) soon after 700 CE. At no time does Bede use the name Beverley, in any of its various forms, and Leach (1898) was sceptical of any evidence linking the name of Beverley directly with this early reference to St John. However, subsequent excavations at Lurk Lane, near the present Minster, have revealed clear evidence of an early 8th century monastic enclosure and a recent re-evaluation of a medieval document '*On the resting place of the saints*' suggests that St John was being linked to '*Beferlic*' by the mid 9th century (Evans 2000). In the Domesday survey (1086) the settlement is clearly identified as Bevreli or Beureli but other early versions of the name include Beofolic and Beverlac, the latter extensively used in ecclesiastical documents written in Latin.

From early times there has been a commonly held acceptance that the town's name was derived from the one-time presence of Beavers in the area and there are several other English place names thought to reference the Beaver in various similar ways (bever, befor, biber, bjur, etc). In 1829 substantial histories of the town were published simultaneously by George Poulson (c1783 - 1858) and the Rev George Oliver (1782 - 1867). While Poulson was happy to endorse the association, Oliver posited a radically different etymology and argued at considerable length that it was an allegorical reference to some Druidic ritual. Oliver, however, as an avid and influential Freemason, later authored several works arguing for a continuity of ancient ritual through Masonic rites. Almost all subsequent toponymists have been comfortable to confirm the link between the town and the animal and frequently cite it as an example. The second element of the name has caused much more discussion with arguments for it referring to a lake (-lac), cleared pasture (-leah, -lea) or, more recently, lair or lodge (-lic, -lecc, Coates 2002). Ecclesiastical documents favour the -lac interpretation but if so, this would seem almost unique in Holderness and the Hull valley where the designation of a body of standing water as a 'sea' (Hornsea, Withernsea, Woodmansey, Seaton, etc) or less frequently 'mere' (Marton, Marfleet) is the norm. The concept of a woodland clearing created by Beaver activity (centred on the spring-fed Beck?) seems more plausible, with the element also featuring in the names of the nearby villages of Bentley, Rowley and Hunsley.

The antiquary John Leland on his visit to Beverley c1540, records having found the name Beverlac in an ancient manuscript:

"Deirwald locus memorosus, id est, Sylva Deirorum, postea Beverlac, quasi locus vel lacus castorum, dictus a castoribus quibus Hulla aqua viccina abundebat." – Lel. Coll. vol.4, p100 (Poulson 1829).

[Deirwald, a memorable place, that is, the Forest of the Deirs, afterwards Beverlac, a place or lake of Beavers, with which the nearby Hull water abounded.]

The document in question seems to be that of Simon Russell compiled in c1416; this contains much 'imaginative' material. The document is known by several names – The

Register of Simon Russell, The Provost's Book, The Great Register, The Town Book of Beverley, Book of the Commandary or Prepositure of Beverley (Widdrington 1897). This may also be the document alluded to by Speight in 1903 but it seems to carry no implication that the Beaver was still present at Leland's time of writing. It must be noted that the small chalk streams draining into the River Hull from the Wolds may have provided suitable Beaver habitat in past times. However, it is unlikely that the river channel below Beverley, by this time tidal and extensively used for navigation, would have been particularly attractive, as Beavers appear to avoid brackish waterways (Coles 2006).

The first direct depiction of the Beaver in association with the town occurs on a seal showing a Beaver at the feet of St John of Beverley. An example of this is illustrated by Poulson (1829) but the animal does seem to bear a remarkable resemblance to an otter. The Beverley Borough arms, recorded in 1584, also reflect this association – "Argent, three bars wavy azure; on a chief azure, a Beaver with its head turned and biting at its fur, or" (Baggs *et al.* 1989). This unusual attitude is reminiscent of its depiction in early bestiaries where it is often shown self-castrating – a myth as old as Aesop's Fables (The Hunted Beaver). This may be a deliberate bowdlerisation of the widely held belief that when cornered a Beaver would bite off its own testicles. As it was believed that the valued castoreum was secreted by the testicles, there would then be no reason for the hunter to kill the animal and it could make its escape (see Howes 2013). The early adoption of the mammal as a symbol of the town, if only as a punning reference (always common in the heraldic tradition), demonstrates that the Beaver was still a well-recognised animal but not necessarily that it was still a part of the local fauna. A Beaver with blue and white wavy lines, alluding to the assumed lake element of the name, still features prominently in the town's corporate image (Fig. 6).



Figure 6. Beverley coat of arms. Photo: A. Gomez.

Should we reintroduce Beavers to East Yorkshire?

On the balance of evidence, the Beaver was probably extinct in Holderness and the Hull valley by the early 11th century, but possibly still within folk memory. The recent launching

of the Hull and East Yorkshire Local Nature Partnership, has started discussions about the possibility that Beavers could return to East Yorkshire. Beavers would find a region very unlike that in Mesolithic and medieval times with the fens drained, the meres and pastures replaced by arable fields criss-crossed with drains and ditches, the river straitjacketed by grassy flood-banks and the woodland carrs mostly gone (Rotherham 2010). Additionally, the rich tills and flat terrain has meant that woodland was extensively cleared, and the area has very low woodland cover (less than 2% against an average in England of 10%) (Forestry Research figures released 15 June 2023, Website reference 3). Low tree cover, particularly along riparian habitats is likely to limit potential reintroduction sites. An exhaustive assessment of habitat suitability (e.g. Graham *et al.* 2020) would be needed before any reintroduction in East Yorkshire could be carried out, but potential reintroduction sites could include the headwaters and streams of the River Hull, and the Hornsea Mere area. Beaver activities are likely to compromise flood defences, for example by digging into flood banks or blocking culverts, and create conflict in such highly managed landscape and should be managed carefully (Campbell-Palmer *et al.* 2016). If these negative impacts can be successfully mitigated to allow for their positive effects in habitat creation and biodiversity enhancement in the Hull valley and Holderness, reintroduction should be considered, following a consultation period with local communities.

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The Dark Club-tailed Millipede *Cylindroiulus londinensis* in the Yorkshire Dales

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On a walk back from Gaping Gill, North Yorkshire (VC64) on 1st May 2023 I found a very large black millipede under thick moss on a rotting log in Trow Gill SD755716 (Fig. 1) at an altitude of 300m. It was carefully examined for the presence of the characteristic pale clubbed tail, diagnostic for *Cylindroiulus londinensis* (Fig.2, p94). Continuing down the dale I found additional specimens in Clapdale at SD757715 and under moss on a limestone wall along Clapdale Lane towards Clapham at SD748702.



As these proved to be quite significant records for Yorkshire I returned to the site on 6th May 2023 for a more intensive investigation. Starting from

Figure 1. Trow Gill. Site of the first record, and many subsequent records. Photo: D. Whiteley

the village of Clapham, some specimens were found in the churchyard of St. James' Church, and adjacent lanes SD745694 and in leaf litter at the Clapham Conservation Area at SD744694. To the west, I also found specimens under a log on the edge of the Old Clapham Road at SD740699. It proved to be very common along the Ingleborough Estate Nature Trail through Clapdale Wood and beyond to Ingleborough Cave and then further up Clapdale (SD7469, SD7569, SD7570, SD7571). I found it at over 20 sampling points. Again, many specimens were located in Trow Gill under moss on rotting logs. A record on the edge of the tree line above Trow Gill at SD754717 was at an altitude of 330m in Rowan leaf litter on a rocky limestone outcrop ledge. This could be an altitude record for England.



Fig. 2. *Cylandroiulus londinensis* showing the characteristic projecting club-shaped telson. Photo: D. Whiteley.

Most specimens were found under thick moss on rotting logs or stumps. Some were found in leaf litter under Beech or oaks. Others were found under logs or stones. A tufa depositing spring in Clapdale Wood produced about a dozen dead specimens that appear to have drowned. Clapdale is a broadleaved-wooded Carboniferous Limestone gorge with some small acidic areas from Ordovician outcrops. On the day it was easily the most common species of millipede in the valley. Most were adults, but some immature specimens with a brassy colouration were frequent. These have a superficial resemblance to *Cylandroiulus caeruleocinctus* but the projecting club-shaped telson is diagnostic.

These records seem to be the first Yorkshire records for over seventy years. Three hectads around the North York Moors, mapped in the published national atlas (Lee 2006) are attributed to Gordon Blower in 1951 and 1952. Records on the NBN Atlas for Brockadale in 1977 and 2000 are suspected mis-identified *Cylandroiulus caeruleocinctus* a species that is well-known from the reserve (Paul Lee *pers com*). In the past there has been some nomenclature confusion between the two species.

Cylandroiulus londinensis is probably native to Britain and quite frequent in southern England (Lee 2006 and NBN Atlas). Northern colonies are often associated with ornamental gardens (Steve Gregory *pers com*). This is also my experience with the species in Galloway, Scotland.

The likely origin of this large and extensive population is the ornamental garden that is now part of the Ingleborough Estate Nature Trail at Clapham. Former owner Reginald John Farrer (1880-1920) was a well-known plant collector and author. He collected plants from Asia and brought them back to the family estate. No doubt, plants and soil from other parts of England were also introduced. More Rhododendrons were planted by the estate in the 1970s and 1980s.

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Harvest Mice in the North York Moors National Park 2013 to 2022

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Introduction

The Harvest Mouse *Micromys minutus* in Great Britain is something of an enigma, seldom seen in the wild and of uncertain distribution. It has not, until recently, seemed to receive as much attention locally as some other small mammals, largely because its aerial lifestyle means it is not often taken in Longworth traps. And so it was, at a meeting in 2013 of the regrettably now defunct North York Moors National Park Mammal Forum, that a question regarding the status of the Harvest Mouse in the National Park was raised. It soon became clear that although there were a few anecdotal records, Harvest Mice had generally only been recorded from the low-lying areas around the periphery of the Park, but there were few records from the higher ground within the Park itself (Delaney 1985; Oxford *et al.* 2007).

This article gives an account of approximately 10 years survey work attempting to ascertain the distribution of the Harvest Mouse in the North York Moors National Park in more recent years.

Method

Three methods were considered: Longworth trapping, searching for nests and owl pellet analysis. The latter was chosen primarily as a consequence of constraints on the author being away from home for periods of more than two or three hours. Owl pellet analysis enabled the work to proceed flexibly at home as and when time permitted. Furthermore, and importantly, owls have a well proven record when it comes to catching small mammals over wide areas and in all seasons. Fortunately, the writer had made the acquaintance of a group of licenced bird ringers who generously offered to collect samples of owl pellets from different sites in the National Park as they went about their ringing activities. The successful outcome of the project owes much to this collaboration of interests. Throughout the reporting of this work, care has been taken to treat the actual locations of any sites as confidential to minimise the possibility of undue disturbance (or worse) to the birds.

In the autumn of 2018, a link was established with the Tees Valley Wildlife Trust who were about to start work on a project to provide more owl boxes within their sphere of activity. As this overlapped the north eastern part of the National Park, there was common ground

by which both parties could benefit from a sharing of resources and results, and the joint effort continued successfully for a number of years adding 19 new sites and 34 samples to the totals.

Over the 10 year period a combined total of 134 sites was sampled. Sample size was aimed at 40-60 pellets/sample/site but varied in a range between 1 and 195, dependant on availability and ease of access to the site. The total number of pellets analysed was in excess of 7,300.

Individual pellets were soaked in water and gently teased apart in a domestic flour sieve under a running tap to separate the fur and dust from the bones. Transferred to still water, the cleaned bones being denser sank, leaving the fur floating on the surface which was then carefully scooped off using a tea strainer. The bones were dried, examined, and those of interest separated for identification and counting.

Identification was carried out in stages, initially by the size and shape of the skulls to separate the voles, mice, shrews or any other groups, followed by examination to determine the differences in the jaws, teeth and tooth root configuration. For a Harvest Mouse this would translate into much smaller skull and jaws, with five tooth roots in the front upper molars in the skull, and three in the jaw front molars, with a total of seven molars in each jaw. This is detailed and illustrated in a Mammal Society booklet, *The Analysis of Owl Pellets* by D.W. Yalden (2003), although a revised publication is now available (Ramsey & Crawley 2023). Other bones may be encountered e.g. moles, rats, rabbits, bats, frogs/toads and birds, although less commonly. Although the situation seldom arose, where a bone could not be confidently identified, it was not included in the total of prey items and was discounted for the purposes of the project objectives. It is possible that very small or lightweight items could have been overlooked at the fur/bone separation stage but unlikely, because bones of value for identification purposes were either too large e.g. skulls, to be overlooked, or dense enough to avoid floating and being discarded with the fur e.g. pygmy shrew lower jaw bones. A rough measure of the effectiveness of recovery of complete useful bone sets i.e. one skull with one pair of jaws, would suggest that such loss was not a significant problem.

Fig. 1 (opposite) is a map of the North York Moors National Park on which the sites sampled have been plotted and those with positive evidence of Harvest Mouse presence are highlighted. It should be noted, however, that where a site is stated to be negative for Harvest Mice, this does not mean that Harvest Mice were necessarily absent, but merely that they were not found in that sample. This leaves open the possibility that Harvest Mice could be present, as shown in Table 1 of the online appendix, available at:

<https://www.ynu.org.uk/about-the-ynu/publications/download-page/category/9-appendices>.

By the end of 2022 a total of 134 sites had been sampled, some several times in a year and others over periods of several years. Of the 134 sites, pellets from 53 sites were found to

contain skeletal remains of Harvest Mice (39.5%). In total, the number of Harvest Mice identified was 163.

The widespread distribution of the positive sites can be seen in their locations in the principal dales in the National Park. Of the southern dales, Bilsdale, Bransdale, Farndale, Newton Dale, Rosedale and Ryedale, only Bransdale and Farndale failed to produce positive results, but it should be said that only single samples were submitted from each of those two dales and the one from Bransdale was made up of only four pellets. Of the more northerly dales, Danby Dale, Glaisdale, Murk Esk dale and Esk Dale itself, all generated positive results, whilst Great Fryup Dale returned a negative result. Neither Baysdale nor Westerdale have been surveyed or sampled as yet. Following the cooperative work with the Tees Valley Wildlife Trust, nine samples from a group of 19 sites from the north-east of the survey area were found to contain Harvest Mice remains.

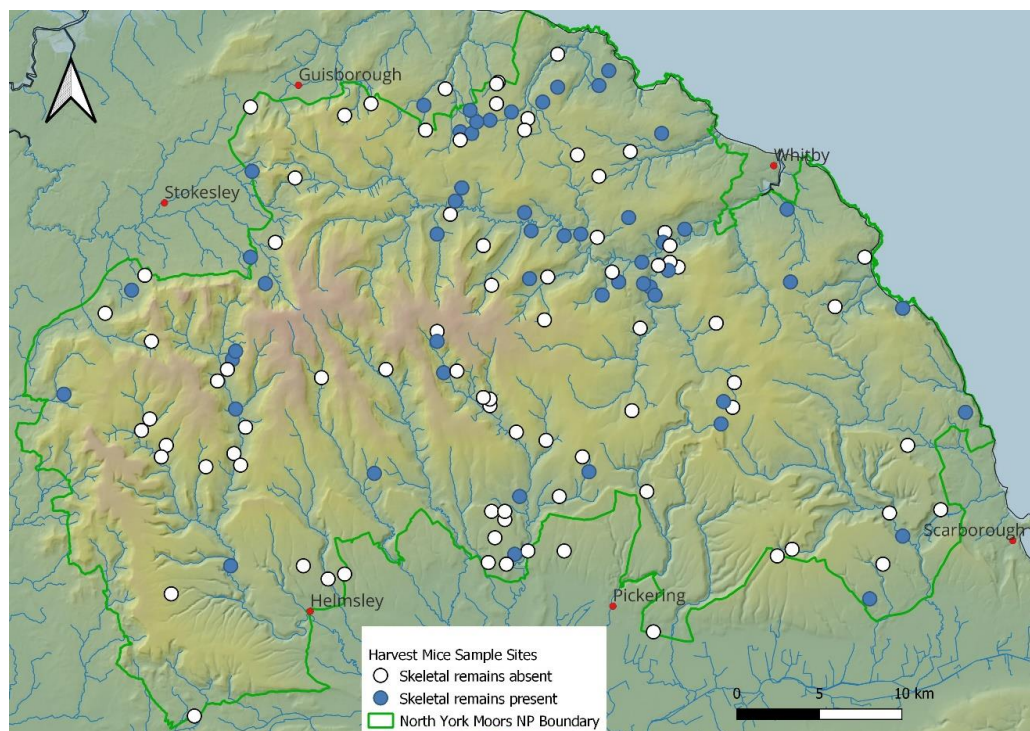


Figure 1. Sample sites for Barn Owl pellets within the North York Moors National Park, indicating presence and absence of Harvest Mice skeletal remains. Contains OS data © Crown copyright [and database right] [2023].

The work has also demonstrated that in some sites Harvest Mice were found irregularly but repeatedly over periods of several years, indicating well established populations. The online appendix (Table 1) shows the sites where positive evidence of Harvest Mice was found and secondly, the number per annum and how frequently they were found.

Discussion

The early surveyors searching for Harvest Mice seem not to have been very successful because the words scarce, sparce or patchy were used to describe their distribution, (Bond 2010, 2012). In fact, these terms remain just as valid today, as they are seldom encountered randomly in the wild. However, to those who worked on the land prior to the onset of mechanised harvesting, they may not have been quite so unusual, especially at harvest time (Hannah & Bartram 2018). The practice then was to tie armfuls of cut stalks of corn to make sheaves which were then stacked manually to make stooks for drying. As several families might have been involved in this close physical handling of the cut stalks, the likelihood of encountering Harvest Mice and their nests was probably quite high, but of course, it was not recorded. Compare this with contemporary times, where a single operative is seated up high in the cabin of a combine harvester and relatively remote from the reaping action. Even if Harvest Mice were present, the farmer is less likely to see them! The work described here sets out to assess the current status of the Harvest Mouse in an attempt to rectify the lack of adequate recording effort which has prevailed in recent years.

Fig. 1 (p97) is a relief map of the North York Moors National Park showing the boundaries of the area from which samples of pellets were taken. A significant part of the Park itself comprises an area of heather-covered high moorland. From among the highest points in the northern upland, and along the widest part running east and west, radiate a series of steep-sided valleys carved out by glacial meltwater. Steep escarpments with rocky outcrops form the western and northern Park boundaries, as do the precipitous sea cliffs to the east. The slope from the central high moorland to the southern Park boundary, however, has a far more gradual incline while its underlying geology is limestone compared to the acidic nature of the sandstone to the north. It is generally more amenable to lowland agricultural practices and developments. The valley bottoms are farmed, but climbing further up towards the heads of the dales and along the steep valley sides, the terrain is less hospitable with a widespread area of poor quality land, amid fallen rocks largely covered by bracken and coarse grasses, and extending for many miles around the steep sides of the surrounding high moors, and is viable only for game bird shooting and sheep grazing.

The survey has shown however, that this large, undisturbed habitat, having excellent connectivity and largely uncontaminated by pesticides, is greatly favoured by a variety of small mammals. The relatively recent resurgence of the Barn Owl *Tyto alba* population brought about by a series of warmer winters and the provision of artificial nesting boxes, has presented an excellent opportunity for studying the distribution of these small mammals. More members of the public and the farming community are putting up nest boxes, with quite a number having cameras in the box to observe the owls activity. Most are interested in learning about what their owl has been eating, and how it varies and affects its breeding condition. This has been the basis of a most successful collaboration between the writer and a number of licenced bird ringers working in different parts of the Park, who collected samples of pellets and, in return, would receive details of the pellet analysis, providing valuable information to help to assess and compare breeding performances of the owls between different sites and seasons.

Some difficulty has been found, however, in achieving an even spread of sites covering the whole survey area. A shortage of interested personnel, particularly in the south and western parts of the Park, has meant that the survey is not yet as evenly balanced as one would have hoped.

Concluding comments

Although the present work gives a potentially optimistic picture of the distribution of the Harvest Mouse in the National Park, it is worth noting that the most recent revision of the IUCN Red List places this species in the Near Threatened (with extinction) category in England and in the UK. It has been identified as a species clearly in decline across Britain. Consequently, steps must be taken to protect its favoured habitat of tall rough grassland with hedges and overgrown ditches. In this respect, low density planting of native broad leaf trees in gullies and gills may be favourable, but extensive high density planting would be detrimental to both Harvest Mice and Barn Owls, both of which depend on a more open field habitat.

The results of the survey have emphatically answered the original question regarding the status of the Harvest Mouse by providing recent evidence of its widespread presence in the National Park. There are also sufficient data to show a continuity of breeding at some sites. What the survey does not show, however, is whether the population at each site is numerically stable, or whether it is increasing or in decline. The results obtained so far, while encouraging, are not sufficiently regular or standardised to provide that answer. However, the ornithological world could point the way to improving the recording technique, e.g. along the lines of the BTO Constant Effort Recording Scheme. The application of such recording to pellet analysis results means that data could be gathered not only on Harvest Mice, but simultaneously on any or all of the other small mammal species making up the remainder of the Owl's diet i.e. maximum data yield from any number of selected sites for minimum effort.

A good example of this was the considerable collaborative role with the Barn Owl Research Project initiated by BirdWatch Ireland and University College Cork in 2006 using owl pellet analysis in the discovery and subsequent monitoring of the rapid dispersal of the Greater White-Toothed Shrew (*Crocidura russula*) in the Republic of Ireland (Lusby 2011). In view of its alleged decimation of the local Irish Pygmy Shrew (*Sorex minutus*) population, its recent appearances in north east England (Bond 2023) are very much a topic for speculation. With 113 sites with skeletal evidence of Pygmy Shrews identified as a by-product of this work alone, we already have something of a baseline for recording Pygmy Shrew presence and distribution in the National Park.

As long as owls maintain their appetite, they will continue to provide a fruitful source of data to stimulate the student of small mammals.

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The Iconography of the Hare: there's more to the hare than you think!

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“The eggs of the lapwing are left in my care,
For I am the Mystery and Magic, I am the hare”

Sharon L. Shute

The native Mountain Hare *Lepus timidus* is a shy, timid creature now confined to the Scottish Highlands and northern England. It is Britain's swiftest land animal reaching up to 50 mph. It lives on open grassland, resting and nesting in slight depressions called 'forms' which it makes in the vegetation. In times gone by it was thought that as hares were observed in the same areas as nesting Lapwings the eggs had been laid by them. Stone Age bones from the remains of Mountain Hares were discovered in Joint Mitnor Cave in Devon between 1939 and 1941. The Brown Hare *Lepus europaeus* is a separate species, introduced, it is now thought, in the Iron Age, between the fifth and the third century BC (Sykes 2020), and is naturalised. Depending on the context in which they are found, it is usually fairly easy to decide which are hares and which are rabbits. For example, hares are usually depicted sitting upright whereas rabbits are crouched close to the ground. As hares do not use burrows an

animal entering a burrow is indicative of a rabbit whilst one emerging symbolises resurrection. The burrow represents a sepulchre.

Dating from the Sui dynasty, late 6th/early 7th century (589-618 AD) on the ceiling of a Buddhist cave temple at Dunhuang in China is an image of three hares formed in a circle and joined by the tips of their ears so it appears as though each has two ears, yet there are only three depicted. This motif pre-dates Christianity and appears in Buddhist, Christian, Islamic and Jewish art. It is found on a Mongol coin circa 1281-82, and on an Iranian metal tray circa 1300. This same image appears in medieval churches in this country and in Europe. The earliest known representations in Britain are a mid-14th Century tile at Long Crenden, Buckinghamshire and a floor tile from Chester Cathedral. A capital in Selby Abbey (Fig. 1.) illustrates three hares and a leveret (a young hare), whilst in Beverley Minster (1520) the supporter to a misericord illustrates 3 rabbits or hares (Fig. 2, p102). In Devon and Cornwall this image is known as The Tinner's Trinity; the reason for this is unknown.



Figure 1. Three hares (or rabbits) with a leveret outside the circle on a roof boss c.1300. Selby Abbey. Photo: Brian Lucas.

The hare is an animal of myth and legend worldwide; it is a pagan symbol, a sacred animal, a symbol of spring and rebirth, resurrection, fertility, of lust and fecundity. It was an attribute of Aphrodite, the goddess of love, of Eostre, the Teutonic goddess of dawn, and of many saints. Pre-Christian pagans believed that to see a hare gazing at the moon would bring new beginnings. A small constellation is named Lepus after the hare and in the Christian Church it symbolises the resurrection of Christ, the Virgin Mary and Trinity.

The pagan festival of Eastre was celebrated in honour of Eostre at the vernal equinox (Easter is a modern word derived from Eastre). The hare is an attribute of Saint Martyn of Tours, whom it is said, protected the hares from hunters and their dogs, and of Saint Melangell, a Welsh hermit and abbess who saved a hare from a prince's hunting dogs. It is a witch's familiar (small animal or imp kept as a witch's attendant), there being a superstition that witches could be transformed into hares and vice versa. It was deemed unlucky to see a hare crossing your path. Mentioned twice in the Bible (Leviticus 11:6 and Deuteronomy 14:7),

the animals are considered unclean and therefore should not be eaten. However, it was held that a newly born rabbit could be eaten on a Friday (fish day) because it swam in amniotic fluid!

The medieval bestiary stated that hares reproduce without copulating; hence it was a symbol of purity, of virgins and of the Virgin Mary. In some countries they represent the Holy Trinity or eternity.

Images of the animal can be found on roof bosses, capitals, floor tiles, misericords, pew ends and in windows. Beverley St Mary's Pilgrim Rabbit from 1330, was perhaps the inspiration for Tenniel's depiction of Lewis Carroll's March Hare. Ampleforth has a stone capital with 4 hares, and Beverley Minster has a hare riding a hound, perhaps a skit on hunting.

Fables, idioms, proverbs and sayings in common usage in earlier times are still relevant today:

- 'Hare-brained' is to be rash or reckless "A hare-brained Hotspur, Govern'd by a spleen" (Henry IV, Pt 1) 1548.
- 'Hare-lip'. Lip of hare was first used by Galen, a Greek physician circa 129-216 AD.
- A much later myth stated that a malicious elf or fairy caused a new born baby to have the cleft/split upper lip like that of a hare.
- Harefoot - Harold 1, son of King Canute, had the nickname Harefoot, an allusion to his swiftness.
- Claimed by Pliny the Elder, eating hare meat cured sterility; similarly, Samuel Pepys touched a hare's foot and said it cured his cramp.
- 'To kiss the hare's foot' means to be late, the idea being that only its footprint will remain after the animal has fled.
- 'Run with the hare and hunt with the hounds' is a metaphor for playing a double game and was first used by John Heywood in 1546.
- 'Hare and Hounds' is a game played by public schoolboys in the 19th century.
- 'To start a Hare' is to introduce an irrelevance into a serious discussion thereby creating a diversion.



Figure 2. Three hares (or rabbits) on a supporter to a misericord of 1520 Beverley Minster. Photo: Brian Lucas.

- 'Slow and Steady wins the Race' is a reference to Aesop's fable of the Hare and the Tortoise where the slow moving tortoise beats the much faster hare.
- 'Mad as a March Hare'. The saying arose from the female doe rebuffing the unwanted attention of the males. This saying is thought to have originated circa 1500 AD in a poem called 'Blowbol's Test' which states: 'then they began to swerve and to stare and be as brainless as a March Hare'.

A list of proverbs and epigrams in common usage in Tudor England was published in 1546 by John Heywood, who wrote 'Hold with the hare and run with the hounds' and 'Ye stampe and ye stare, Ye frete and ye fume, as mad as a March hare'. This was later used by Lewis Carroll in his 1865 book *Alice's Adventures in Wonderland* when he wrote: 'The Hatter shook his head mournfully "Not I" he replied. "We quarrelled last March – just before he went mad you know" (pointing with his teaspoon at the March Hare)'.

A poem written by Ralph Hodgson, who had an interest in ecology and a compassion for all living creatures, mentions hares in the last line of his poem "The Bells of Heaven":

*'Twould ring the bells of heaven
The wildest peal for years,
If parson lost his senses
And people came to theirs,
And he and they together
Knelt down with angry prayers
For tamed and shaggy tigers
And dancing dogs and bears
And wretched blind pit ponies.
And little hunted hares"*

(The sport of Hare Coursing is over 3,000 years old and was probably introduced by the Romans. Anglo-Saxons however believed the hare to be an attribute of Eastre so hunting it was taboo.)

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The Story of Old Moor - Part 3

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Design Brief

Earlier contributions to this series on the development of Old Moor Nature Reserve have explained the background to the project and the early stages of its evolution. Part 3 will concentrate on the detailed brief which specified the design requirements of the various elements of the proposed nature reserve. The hydrological system for the site was planned to give the greatest extent of flexibility and based on the following three principles. Each unit must be:

1. capable of achieving water levels independent of the others
2. fed by a gravity flow system
3. supplied by a system which also allows the isolation and drawdown of individual sections whilst retaining supplies to surrounding lower tier units.

The reedbeds would require 0.3m drawdown to the substrate surface for exposure of litter layer. The main lake should remain reasonably constant apart from natural drawdown during summer months. The wader scrape would require a 0.4m drawdown and the flood meadows a 0.3m drawdown to the substrate surface in the lowest lying areas.

Above all there should be a constant flow through most of the units (Fig. 1 opposite). In reedbeds, low flushing rates are associated with low oxygen concentrations and a build-up of ammonium compounds inhibiting reed growth. In areas where there are large concentrations of feeding or loafing birds, flushing is necessary to prevent nutrient build-up causing algal blooms.

The following retention times were recommended.

- Main lake 50-72 days
- Wader scrape 18-36 days
- Reedbeds 36 days
- Flood meadows Winter only and then only when hydrological conditions allow
- Themed area 10 days

Habitat Prescriptions

Main Lake

This is designed to increase the site's regional importance for wintering wildfowl by providing habitat for existing populations and encouraging increased density and diversity of species. The numbers of summering and nesting wildfowl should be enhanced by provision of nesting islands and a sinuous shoreline. The bed profile of the lake should be variable with certain requirements, as follows:

A ring-fence of water, at least 2 metres deep, would prevent colonisation of the lake by emergent aquatic plants. The margins of the lake, and in some areas associated with islands in the lake, should shallow gradually at a gradient of around 1:50 between 0.0m and 0.5 metres water depth for dabbling ducks.

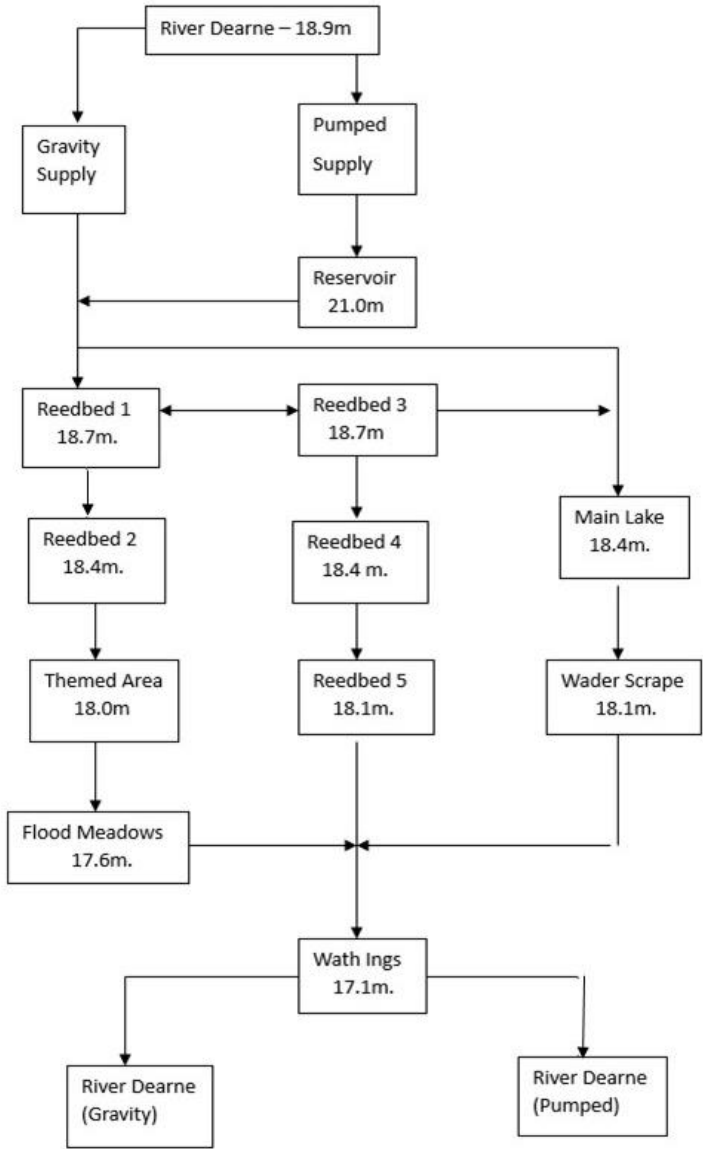


Figure 1. Schematic water flow chart.

For breeding wildfowl, islands should have a minimum area of 200 m² and should slope from the shoreline at a gradient of 1:5 to a top height of 0.5-1.0 metres above water level. Margins should be sinuous. Due to the expanse of water and the prevailing wind direction a number

of islands and some shorelines would be susceptible to wave erosion. This can be mitigated by the positioning and profile of islands. Groups of islands will provide sheltered bays for diving ducks. The flood bank between the main lake and the reedbeds should have a gradual gradient and be managed as 'Wigeon Lawn'.

Reedbeds

Occupying a substantial proportion of the overall site, the reedbeds should attract high densities of breeding species such as Reed Warbler and Reed Bunting but also, in the future, possible colonisation by Bittern and Bearded Tit. The presence of open water meres and channels would also attract other waterbirds for feeding, breeding, or roosting. The reedbeds are designed in separate units enclosed by low bunds capable of retaining water depths of up to 0.3 metres above normal levels (allowing for future rises in litter layers) and 0.5 metres freeboard (height of the banks above water level, which separate the reedbed compartments) and to be at least 4 metres wide to allow vehicle access. Water is supplied to each unit as previously described and where ditches pass through retaining bunds, water levels can be fine-tuned with 'L-bend' pipes.

The reedbeds should be constructed with an impermeable lower bed level with a surface substrate of 50:50 topsoil and subsoil mix to a minimum depth of 0.3 metres placed with minimum compaction. The reedbed should incorporate a number of small meres, each ring-fenced with underwater trenches at least 2 metres deep to prevent reed encroachment. Shallower water can then be created in the middle of the meres. The reedbed levels should be variable and rise gradually at the margins to provide a range of reed at various water depths.

Wader Scrape

This area should be the main focus for feeding wading birds during periods of passage migration. Construction and management of nesting islands may attract breeding Terns and Ringed and Little Ringed Plover. The area should be designed as a shallow basin with a very gradual gradient to present a large area of open substrate following a small drop in water levels, with un-vegetated islands separated from the mainland by a 1.5 metre deep security canal.

The Wader Scrape should have an impermeable lower level, covered by an un-compacted layer of topsoil 0.4 metres deep taken from a dry area of the site and likely to be free of aquatic weed seeds. To encourage a high organic content, it may be necessary to allow some plant growth from the seed bank prior to flooding. These would decompose to provide an initial flush of organic matter and nutrients.

Water levels should be maintained at the maximum level between October and March. During April and May levels could be lowered giving shallow water depths across most of the area and exposing areas of wet mud. Further slight lowering in late May and June would provide shallow water for feeding broods and should fluctuate around this level from mid-June to the end of September for the Autumn passage. Levels would then be brought gradually back to maximum into October (Table 1, opposite).

Management requirements would be mainly around vegetation control on islands and its encroachment on to open mud areas. Fully submerging islands by winter flooding could inhibit vegetation encroachment there. High invertebrate densities could be enhanced by periodic (every 4-6 years) drawdown in July to allow rapid colonisation by annual species which should be rapidly submerged in September.

Table 1. Summary of proposed annual water level management for wader scrape.

Period	Aims	AOD	Water Depth (m)		
			Mean	Range	Ditch
Jan-Mar	Basin flooded to maximum depth (Islands submerged by 0.1m.) water flushing.	18.1	0.3	0.1-0.4	2.0
Apr-May	Levels varied around operational level to constantly re-wet large areas of exposed mud. No flushing necessary.	17.9	0.1	0.0-0.2	1.8
Jun-Jul	Levels maintained at low level. Water flushing.	17.8	0.5	0.0-0.1	1.7
Aug-Sep	Levels fluctuated around operational level to constantly re-wet large areas of exposed mud. No flushing necessary.	17.8	0.5	0.0-0.1	1.7
Oct	Levels gradually raised throughout month. No flushing necessary.	18.0	0.2	0.0-0.3	1.9
Nov-Dec	Basin flooded to maximum depth (Islands submerged by 0.1m.) water flushing.	18.1	0.3	0.0-0.4	2.0

Flood Meadows

The objective was to maintain and enhance breeding habitat for wading birds and wildfowl. Wet grassland inundated to a shallow depth in winter should attract a wide range of wildfowl species whilst supporting breeding waders such as Redshank, Lapwing and Snipe in early summer. Ditches associated with the grassland can also be used by breeding wildfowl.

A broad ridge and furrow landform was suggested with each furrow flat and around 10-15 metres wide, the ridges flat and around 5 metres wide. There should be a height difference of about 0.3 metres between the ridge and the furrow and the ridges should be approximately 30-50 metres apart (Fig. 2 p108). In this way water can be retained in the furrows by surface flooding, thereby enabling surface-damp conditions whilst still presenting a large area of shallow 'edge' habitat suitable for feeding and areas above water level suitable for nesting.

In areas to be excavated it is important that topsoil is retained for re-spreading on the excavated areas and remains un-compacted to retain an abundant earthworm population. This will allow maximum regeneration from the seedbank. Ideally the area should be left unflooded for 1-2 seasons to allow soil structure and fauna to develop. If in short supply

topsoil should be deposited in the furrows. The area is divided by ditches which should hold a minimum of 1.5 metres of water in April to June.

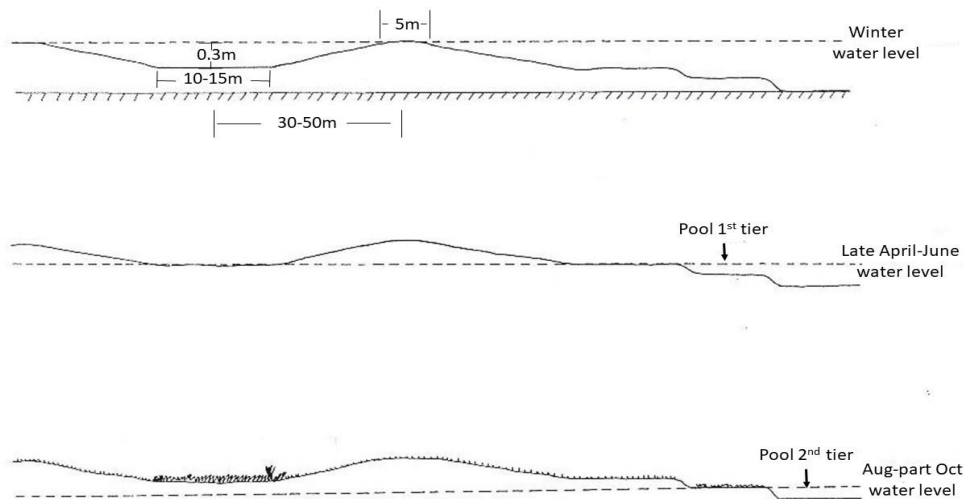


Figure 2. Seasonal changes in flood meadow water levels. Not to scale; dimensions are only approximate.

The proposed water level management scheme is summarised in Table 2. Prolonged flooding can be detrimental and every 5 years surface flooding should be prevented for 2-3 seasons. Water levels should be lowered during March for the oncoming summer and from July to October the surface allowed to dry out to enable access for grazing stock.

Table 2. Summary of proposed annual water level management for flood meadows.

Period	Aims	AOD (m)	Water Depth (m)				
			Mean	Range	1 st tier pools	2 nd tier pools	Ditch
Jan-Mar	Meadow flooded to top of ridges giving a maximum of 0.3m water depth in furrows.	17.6	0.25	0.0-0.3	0.4	0.6	2.0
Apr-Jun	Water level lowered gradually in April and maintained around furrow base May-June. Maintain surface wet conditions in furrows by supplying water to replace loss. Water table to be lowered to 0.3m below ridge peak.	17.3	0.05	0.0-0.1	0.1	0.1	1.7
Jul-Sep	Water level lowered or allowed to lower further to create surface dry conditions for grazing/mowing. About 0.3m below furrow base & 0.6m below ridge peak.	17.0	0.00	0.0-0.0	0.0	0.1	1.5
Oct	Levels gradually raised throughout month.	17.3	0.15	0.0-0.1	0.1	0.3	1.7
Nov-Dec	Meadow flooded to top of ridges giving a maximum of 0.3m water depth in furrows.	17.6	0.25	0.0-0.3	0.4	0.6	2.0

Themed Area

The Themed Area in the original scheme was designed as a series of discrete units screened from adjacent areas by natural features like banks, ditches, hedgerows etc. This was intended to add to visitor 'feeling of discovery' as they passed from area to area. This level of facility, exciting as it was, depended on the level of funding initially expected and became impossible with the reduced budget. For reasons of continuity the name 'Themed Area' has been retained throughout the rest of this account although its character changed from the original concept to a more low-key area where visitors can immerse themselves in the wetland character more intimately before progressing out to the remainder of the site. Here viewing is more constrained by lookout hides where birds can be viewed without disturbing them. The Themed Area also comes into its own for school groups, pond dipping etc.

Final Design

Discussions of draft plans based on the brief produced by the Wildfowl and Wetlands Trust took place between the Conservation Liaison Group, the Wath Ings Management Committee and individuals with long term knowledge of the site.

Since the flood defence requirements were at the heart of everything at Old Moor, it needed to inform other decisions and be dealt with first. The engineers from the National Rivers Authority were very helpful and took a flexible attitude providing the flood capacity was retained. Since the various compartments, Main Lake, Wader Scrape, Reedbeds etc. would be tiered to benefit from a gravity flow of water through the site, this tiering could be used in reverse to accommodate incremental flooding. We agreed this approach to flooding with Wath Ings and the Flood Meadows being the first level and thereafter progressing gradually up the site with increasing severity of flood events. This meant that light flooding would only affect part of the site.

The public areas, buildings, car park, Themed Area etc. would be protected up to the 1 in 100 year flood events with a flood bank extending fully around this corner of the site, a significant structure in appearance, construction and expense. Borehole surveys revealed a number of shale bands beneath the site which would require sealing with bentonite clay beneath the 'wet' parts of the site. For the flood bank to be effective this clay would also be needed to seal the shale bands to prevent ground water movement from threatening the buildings etc.

Since the gravity system for the site flows through this area from the reedbeds towards Wath Ings, it would be necessary to install valves where pipework passes through the floodbank allowing the area to be isolated from the rest of the site in flood conditions.

The main change from the WWT scheme was the position of Bulling Dike. This emerges from a culvert beneath the Dearne Valley Parkway and meanders across the corner of the site to discharge into the River Dearne. The WWT scheme showed Bulling Dike diverted alongside the road to discharge into the River Dearne next to the road bridge. This location appeared to me to be dangerously close to the Yorkshire Derwent Aqueduct. The aqueduct is actually two side-by-side 1.2 metre (4 feet) diameter high pressure water mains. Yorkshire Water

engineers indicated that only short sections could be uncovered at a time because of the risk of it being forced out of the ground under the high pressure. I didn't want to be responsible for a new Noah's flood in Barnsley!

With Bulling Dike retained on its existing line and the reservoir located between Bulling Dike and the River Dearne, the secondary lake shown on the WWT plan wasn't feasible. On the plus side, omitting the secondary lake allowed the reedbed area to be increased with five units rather than the four shown on the WWT plan. Two of these contained small reed-fringed lakes where the two Reedbed hides are located today.

Another key feature I was keen to retain was the long hedge and ditch extending from the back of the farmyard right down to the edge of Wath Ings. With flood banks protecting this long narrow corridor it provided the best screened access route to potential viewing points overlooking the Main Lake, Wader Scrape, Wath Ings and the Flood Meadows. As well as a footpath, the existing mature Hawthorn hedgerow and water-filled ditch full of aquatic life on one side and the shrub planted screen banks on the other would provide a valuable habitat in its own right e.g. for birds like warblers. This became the Green Lane.

Also around the outer edges of the farmyard were a number of mature trees including a particularly nice Oak tree that needed protection because of its location near the main haul road.

With the layout settled all of the excavations had to be drawn up in detail at a scale of 1:500, with contours at 0.5 metre intervals. This meant three AO size sheets to cover the area. Taking the design criteria for each compartment from the WWT brief was a three-dimensional exercise that needed complete concentration, impossible in a busy office with phones ringing and people interrupting.

I got permission to work at home and spent a week carefully working through the contours for the whole site from the deepest part of the lake (about 3 metres) to the highest part of the banks. From deep channels in the reedbeds to dabbling duck shallows in the main lake, all the nuances of the brief needed detailing. Since it was necessary to have three sheets to cover the site there was overlap and I needed the whole of the lounge floor to lay out all three sheets to make sure they all matched up.

With the contour plans in draft I needed to make a rough check of the flood storage capacity. I used a planimeter, a small hand tool for measuring areas on plans. I made a rough calculation, by laboriously measuring the area of each contour, the difference between the proposed excavation levels and the existing levels of the ground surface. The answer appeared to be positive. (In the end when the plans were digitised for computer aided design by the engineers, the increase in flood storage capacity was quite substantial.)

With the contours completed, a detail specification was compiled from the WWT brief to cover issues such as maximum and drawdown water levels, flow retention times for different compartments (for flushing), substrate compaction, (or lack thereof) soiling etc. This was all

passed to Ron Marshall the Site Engineer for Rotherham MBC, for calculations where necessary and incorporation into contract documents.

A similar exercise was carried out for the landscaping, tree and shrub planting, grass seeding and reed planting. Whilst we did some of the early planting in the Themed Area with training teams, the main part was organised by Landscape Architects within the Council for implementation by contractors.

One area that I decided should be removed from any kind of disturbance was the hay meadow immediately behind the main farmhouse and adjacent to the footpath that now connects the Trans-Pennine Trail and the Car Park with the Visitor Centre. I discovered Adders-tongue *Ophioglossum vulgatum*, a plant suggesting the field is an old flower meadow and may contain other species of note. By leaving the field undisturbed it left open the future possibility of improvement through sympathetic management.

In June 1994 proposals for the Phase 1 Engineering Works were completed and the brief was passed to the Engineers in Rotherham for their work. This contract covered site preparation, stripping the contaminated coal carpet, construction of the culvert and access road and features such as trees that needed protection during the works.

Later in 1994, in a landmark moment for the scheme, Don Bedford from the Council's Estates Department rang to confirm that the land had been acquired. It was agreed however that since building work was some time away the farmer could remain in the house giving him more time to relocate. At this stage the original farm track was retained for access to the farm and the haul road limited solely for the main contractor. The next instalment will cover the implementation of the scheme.

The terrestrial flatworm *Marionfyfea adventor* Jones & Sluys (2016) (Platyhelminthes: Tricladida: Geoplanidae) new to Yorkshire from St Nicholas Fields LNR, York

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The weekly Wildwatch survey group at St Nicholas Fields ('St Nicks') Local Nature Reserve in York has a habit of turning up interesting wildlife finds, and the survey on 24 January 2024 was no exception. Whilst searching underneath some Scots Pine *Pinus sylvestris* logs beside a woodchip pile near the car park (SE61685166), I noticed a small terrestrial flatworm (Fig. 1, p112). We have recorded *Microplana terrestris* regularly in the past at St Nicks but for some reason have failed to re-find it since 2022 (perhaps it is particularly susceptible to

drought?). However, this flatworm was clearly different: dark red with iridescent, pale bluish speckling. I resorted to the Pan-species Listing Facebook Group (n.d.) to obtain an identification, which was swiftly provided by Andy Marquis (and verified by Seth Gibson): *Marionfyfea adventor* Jones & Sluys (Platyhelminthes: Tricladida: Geoplanidae), a species described new to science as recently as 2016 from several European countries (Jones & Sluys 2016). The only other known species of *Marionfyfea* inhabits the Auckland Islands of New Zealand, and *M. adventor* is assumed to have been introduced from New Zealand via the horticultural trade.



Figure 1. *Marionfyfea adventor* underneath a Scots Pine *Pinus sylvestris* log, with a Common Rough Woodlouse *Porcellio scaber*, Common Chrysalis Snail *Lauria cylindracea* and another unidentified snail for company. St Nicholas Fields, York, 24/01/2024 (Photo: Sam Buckton)

Little is known about the ecology of *M. adventor* (Jones & Sluys 2016). However, it has been found in similar habitats in the past, including in soil and under logs, planks and 'dead wood' (Jones & Sluys 2016; Soors *et al.* 2022). In 2012, Brian Eversham found it under a fallen willow log in unimproved wet grassland at Shepreth L-Moor Nature Reserve, in the company of slugs, snails and woodlice. The St Nicks specimen was accompanied by invertebrates including Common Rough Woodlouse *Porcellio scaber* and Common Chrysalis Snail *Lauria cylindracea*. Non-native planarians tend to eat native invertebrates (Sluys 2016), so *M. adventor* may have a negative impact on British ecosystems.

There is a small number of widely scattered *M. adventor* records across Britain, but I am unaware of any previous records from Yorkshire. Flatworms in general appear to have received scant, if any, attention in *The Naturalist*. *Marionfyfea adventor* should clearly be on the radar of naturalists in the county.

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Soors, J, Mees, J, Sevrin, D & Van den Neucker, T (2022) *Marionfyfea adventor* Jones & Sluys (2016), a nonnative land planarian new for Belgium (Platyhelminthes: Tricladida: Geoplanidae). *Belgian Journal of Zoology* 152, 113-116.

John Dodd (1769-1840): A Cumbrian Botanist & his herbarium

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Until recently little has been written about John Dodd and he has remained as an obscure botanist who collected plants in Cumberland at the end of the eighteenth century. He was acknowledged in the works of Turner & Dillwyn (1805), Winch (1833) and Hodgson (1898) for providing 34 species of plants and their locations for Cumberland. It was not until the re-discovery of Dodd's herbarium, for sale in London, that further research was undertaken about the man and his life (Hodkinson & Pearson 2023). Our efforts to raise the money to purchase this collection proved successful and it is now safely housed in Tullie House Museum, Carlisle. The herbarium not only contains his plant collection but also detailed notes of localities, habitats etc. providing an important source of data on the flora of Cumberland in the final years of the eighteenth century. In this article we focus on the collection and what it tells us about the different habitats and vegetation. This provides a baseline for an analysis of the botanical changes in Cumberland over the succeeding two centuries which will be addressed in a further publication.



Figure 1. Double page from herbarium with plant specimens on verso of each page & descriptions on recto of previous page.

Background

John Dodd was born in 1769 at Dalton-in-Furness, with the family moving to Ambleside where his father worked as a customs officer. Having been educated at St Bees School he went on to train for the ministry but did not attend a university. In 1793 he was ordained as a deacon by the Bishop of Carlisle and a year later as a priest. That same year he was appointed as a licensed curate at St Kentigern's, Aspatria, where he remained until 1804. His next appointment was as vicar of St Mary's in nearby Wigton where he remained for nearly twenty

years. Finally, he became vicar of St Nicholas's in Newcastle-upon-Tyne in 1826, where he remained for the rest of his life. A fuller account can be found in Hodkinson & Pearson (2023).

The herbarium

The collection consists of 140 pages arranged in 4 volumes: Volume 1 (47 pages), 2 (47), 3 (23) & 4 (23). The second volume is signed and dated 1798 by Dodd and the final one 1799 so the collection dates from the time that Dodd was curate at Aspatia. The plant specimens are arranged on the verso of each sheet with the descriptions on the recto of the previous page (Fig. 1, p113). The sheets of paper have been bound after the plants had been collected – some of the writing runs into the gutter of the binding.

The plants have been glued to the paper, with each page containing between two and six specimens per page. In some instances, the pressed flowers have been arranged decoratively around the rest of the plant. Unfortunately not all the specimens have survived, with their stains preserved, like ghosts, on the paper. There is some evidence of insect damage despite the use of mercury chloride on the paper to deter pests.

The descriptions consist of:

- (i) the binomial names of the plant (but not the common name, except for Hop Trefoil 4.138)
- (ii) the morphological description of the plant
- (iii) the locality where the plant was collected
- (iv) the habitat where the plant was found
- (v) the abundance of the plant in the locality

Not all the descriptions contain all of the above.

There are 399 species in total in the collection (although this includes duplicates and varieties). There are four bryophytes and thirteen ferns, with the remainder being flowering plants. Table 1 (opposite) is an extract from the herbarium notes, transcribed, with the addition of the current synonyms based on Kew *Plants of the World Online* (Royal Botanic Gardens Kew n.d.).

The collection consists of specimens from a wide range of habitats. However, the groups not well represented include trees and shrubs and grasses. There are 34 species published in Turner & Dillwyn (1805) and Winch (1833) which were provided by Dodd. For nine of these there are no examples in the herbarium; this may suggest that there is a missing fifth volume. The details of these additional plants have been included at the end of the complete herbarium list, available online:

<https://www.ynu.org.uk/about-the-ynu/publications/download-page/category/9-appendices>.

Morphological descriptions

The first volume of the herbarium contains numerous and often extensive anatomical descriptions of the plants. These notes become less frequent in the second volume and are

not included in subsequent volumes. These notes probably helped Dodd to identify the species he collected initially, and possibly as he became more confident as a botanist he became less reliant on them. Unfortunately, there is little evidence as to which botanical book or books he used to help him identify his specimens. None are listed in his will and inventory (Hodkinson & Pearson 2023).

Table 1. Transcribed extract from page 1 of Dodd's herbarium: The whole herbarium list can be found on the YNU website at:

<https://www.ynu.org.uk/about-the-ynu/publications/download-page/category/9-appendices>

Page no.	Dodd name	Current name	Notes & location
1.1			[2 specimens unidentified]
1.2	Lotus corniculatus		Seeds more than 20; Calyx fringed w th long soft hairs; Legum: smooth, terminated by a long straight Point; Heads with a single sitting Leaf at y ^e Base; Flowers in platted heads, in a sort of umbel w th very short spokes; Bloss: before opening of a bloody red on y ^e outside, & a yellowish green within; Road sides frequent. Note Leaves oblong, pointed, 3 on each foot stalk, w th 2 at y ^e base
	Convallaria majalis		Bloss: contracted at y ^e mouth, Segments reflected at y ^e Edge, white, highly fragrant; in Gardens in y ^e North.
	Montia fontana		Pretty common in springs.
1.3	Chelidonium majus		In shady places common
	Ranunculus flammula		Leaf stalks long, rather a doubling of y ^e Leaf. Leaves toothed; rather plentiful in y ^e Meadows near Aspatia.
	Orchis maculata	Dactylorhiza maculata	Root spreading; Leaves underneath silvery grey w th parallel green Veins, spots reddish brown, mostly oval & transverse, Lips of y ^e Nectarium trifid, lateral lobes large – notched, middle lobe quite entire, very narrow?, Stem cylindrical below, angular above; Floral-leaves, y ^e lower longer than y ^e flowers y ^e upper shorter; Stem solid
	Orchis latifolia Var 2.	Dactylorhiza incarnata	In Meadows common. Stem hollow; Floral leaves longer than y ^e Flowers

There is a reference in the herbarium (4.132) to the author of *Flora Londinensis*. Written by William Curtis (1746-1799) and published in six lavishly illustrated volumes between 1777 and 1798, this expensive work was probably beyond the means of a curate. Although Samuel Goodenough was listed as one of the subscribers he was not consecrated as Bishop of Carlisle until 1808 and so Dodd could not have had access to his copy.

There are several other botanical works that Dodd may have used. William Hudson in his *Flora Anglica* (1762) listed variants of species with Greek letters. But for *Potamogeton natans*, for example, he does not list the two variants identified by Dodd in his collection. Hudson lists *Pimpinella saxifraga major* and *Pimpinella saxifraga minor* whilst Dodd has *P. saxifraga* var 3. Another possibility is James Lee's *An Introduction to Botany* (1760) but this can be dismissed because it focuses on Genera, using the Linnean method, with no descriptions of individual species.

The most likely contender is William Withering's *A Botanical Arrangement of all the Vegetables Naturally growing in Great Britain*. The first edition appeared in two volumes in 1776 but there was no record of *Trifolium filiforme*. A second edition was printed in 1787 with a third volume delayed until 1792. This listed seven of the nine variants of plant species found in the herbarium. The exceptions are *Trifolium filiforme*, where Dodd referred to variant 2, which is not included in Withering, and *Viola tricolor* where Withering listed three variants whilst Dodd refers to variant 5. A third, much enlarged edition, was published in 1796 in four volumes and included two variants of *T. filiforme*. This suggests that Dodd used this edition as he began his interest in botany and plant collecting. Further editions of Withering were prepared by William MacGillivray, who condensed the descriptions into a single volume and omitted the variants appearing in previous editions (Withering & MacGillivray 1835).

The different Withering editions also provide interesting insights with his instructions addressed to novice botanists. Each volume provides an explanation of the Linnean classification of plants with worked examples, though the number varies between editions. There are also instructions about the collection, drying, pressing and mounting of specimens. In the first two editions Withering recommended the use of paste or gum water to stick the specimen to the paper with a small quantity of finely powdered arsenic mixed with the paste to deter insects. In the third edition he also recommended that a little alum should be added to the paste to make it last longer and that the addition of some coarse brown sugar to the gum water made it less brittle when dry. He introduced the use of slips of paper to fasten the plant to the paper instead of glueing the specimen itself. It was also recommended that the herbarium be stored next to 'a piece of sponge soaked full of rectified oil of turpentine' to prevent attack from insects.

Plant Localities

The plants were arranged in the order in which they were collected rather than taxonomically. In all there are 175 localities recorded by Dodd, and all but one (Cronkley, Durham) were within Cumbria. Some were collected on visits to Carlisle, Ambleside (where his father lived), and Keswick (to visit Thomas Hutton's museum and botanical garden which

were all within 15 miles of Aspatria). The majority of the plants were collected in his parish or within five miles of the village. Some of the records give very specific locations, such as the vicarage garden, Thomas Hayton's Mill, Mr Allison's pond and so on.

Plant Abundance

Many early botanical records are simply a testament that a species was present in a particular locality and give no indication as to whether it was abundant or not. Furthermore, there is also the suspicion that these collectors were only interested in scarce or rare plants. This was not the case with Dodd. In all he noted the abundance of 107 species and of these 101 were described as common or not uncommon and the remaining six he thought were scarce or rare. There were many more records which were described, for example, as 'growing in hedges' or 'in corn' which suggests that they were relatively common in these specific habitats.

One of the rare plants collected by Dodd was *Impatiens noli-tangere*. He noted 'Owing to being so frequently eradicated by Botanical Travellers, it becomes rarer every year'. Perhaps he ignored the irony or simply saw himself as a local botanist and not one of the many tourists! Even so, it was a recognition that the flora of Cumbria was not static but changing at the end of the eighteenth century. It will later become apparent how this data on abundance can provide insights into these changes as well as the flora which predominated during Dodd's residence in Aspatria.

Habitats

Although Dodd's botanising focused on the parish of Aspatria, he explored what was a varied landscape. It stretched from the coast at Allonby in the west to the Solway wetlands in the north. There are the Rivers Waver to the east and Ellen to the south with other smaller watercourses (dubs, soughs & becks) in between. The arable land lay on the lighter soils with meadows in the Ellen valley as well as on the wetter clays while the common grazing was on the higher areas. By the end of the eighteenth century the open fields had been enclosed with hedges to form the boundaries (Elliot 1960). The common land or 'waste' of some 4,300 acres was not enclosed until 1825, following two earlier parliamentary enclosure acts. Although predominantly an agricultural landscape, the earliest industrial activity dates from the time of the Cistercian monastery at Abbeytown where salt-pans were developed. The first surface mine dates from 1567 with the first pit being sunk in 1681, followed by further collieries over subsequent centuries. The last mine closed in 1942.

Contemporary accounts of the area mostly relate to the state of agriculture in the north of England (Young 1770; Bailey & Culley 1805; and Marshall 1818). Collectively, they provide details of the crops grown, the rotational regime, annual rentals, the state of woodlands etc. Their focus was on methods to increase agricultural productivity and those areas that could be 'improved'. For example, for Cumberland, Bailey and Culley proposed changes to the crop rotation system, the introduction of new stock breeds, the enclosure of common land, the draining of wet land as well as flood control near rivers. Whilst these reports give an overview of the county, Hutchinson (1797) provided greater detail for individual parishes. For Aspatria he wrote 'The town ... is irregular, and straggles over the ridge of a dry sandy

eminence about half a mile in length.’ He went on to note that the commons accounted for half of the land and that it was ‘of a very improvable quality’. There were few sheep kept (about 500) and that mostly young cattle and horses were reared. The crops grown were mainly wheat, oats and barley, peas and potatoes. He also reported that there was little woodland but that several new plantations ‘and other improvements were adding yearly to the beauties of the place’. There were several lakes on Aspatria common but none was of any size.

The first detailed maps for Aspatria were not produced until 1845/6 and were associated with the tithe awards. At a scale of three chains to an inch the maps show each field with its boundaries, roads, houses etc. The award apportionment documents identify the owner or tenant and the name of each field. For Hayton there were just 10 acres of woodland and 5 acres of common out of 1704 acres of farmland. Most of the land was arable (1036 acres) with 24 acres of pasture and 633 acres of meadow. Some of the field names reflect a previous use. ‘Limey Moors’ was now arable, ‘Wood Field’ and ‘Pasture Field’ had also been ploughed and used to grow arable crops. In Allerby there was a similar picture with 629 acres of arable, 77 acres of pasture and 400 acres of meadow with no woodland. In both townships the main crop was oats followed by barley and wheat. In the 50 years between the publication of Hutchinson’s book, the Inclosure Acts of 1812 and 1817 and the Tithe award of 1845, there had been a dramatic change in the land use in Aspatria. The Dodd herbarium reflects the plants growing in a less intensively farmed landscape.

Dodd recorded the habitats where he found the plants in 236 cases. The most frequent were gardens (12%), corn-fields (11%), meadows (10%), ditches (10%), marshes (7%), hedges (7%), woodland (6%), coastal (6%), pastures (6%), river banks (5%), heaths and moors (4%) and roadsides (3%). The remainder included occasional records of walls, church-yards, tree stumps, salt-pan, quarry etc. Overall, it was a rich mosaic of different habitats.

Contemporary botanists

John Dodd was not the only botanist at work in Cumberland in the eighteenth century. (Hodkinson 2024). His own bishop, Samuel Goodenough (1743-1827), was a founding member of the Linnean Society and was vice-president of the Royal Society. In his correspondence (available on-line at www.linnean.org) with Sir James Smith, he referred to ‘our little Circle of Botaniculists’ at Carlisle which included the Rev. John Holme and Dr Robert Hodgson, the newly appointed dean. The bishop travelled widely and was a regular visitor to London where he sat in the House of Lords. His herbarium was donated to the Royal Botanical Gardens at Kew and can be viewed on-line (www.herbariaunited.org). Most of the material had been collected from the south of England with one from Scotland. It is notable that none of the plants came from Cumberland.

The only other botanical list to have survived is that provided by the Rev. William Richardson for William Hutchinson’s *The history of the County of Cumberland*. Though there is some doubt about Richardson’s identity it is most likely that he was the vicar of St Andrew’s at Dacre, who lived from 1699 to 1767 (Hodkinson 2019). Hutchinson’s book was not published until 1794 and was issued in parts until 1797 so it is unclear how he obtained Richardson’s

list. However, it is evident that the original list had been extensively edited. It was stated that those plants frequently found elsewhere had been omitted and Thomas Hutton had added the 'habitats' (localities) for the rarer species so that 'travelling botanists may more readily find them'! The list includes species of *Carex* attributed to Samuel Goodenough which had been published in the Linnean Society Transactions (Goodenough 1794, 1797). The two papers had been presented at the Linnean Society in 1792 and 1795 with their publication two years later. They included only the occasional locality and none for Cumberland. Perhaps these had also been added by Thomas Hutton. Of the 353 species listed, it is not clear how many can be attributed to Richardson as opposed to Hutton. Winch had inspected Hutton's herbarium in 1807 and 1824 and cast doubt on his ability to identify plants correctly. However, Winch appears to have accepted Richardson's list in Hutchinson (Winch 1833). So, when combined with the data provided by Dodd, there emerges a baseline for the flora of Cumberland against which future changes can be assessed.

Acknowledgements

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The Doncaster Collection of Coleoptera: a discussion and database

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Peter Skidmore (deceased)

"For all th[is]e multitude of important uses, properly curated and identified reference collections are indispensable. Paramount among these are collections of preserved material in museums or similar institutions."

Cranbrook (1997, 6)

Introduction

There can be few provincial museums whose collections have been subject to such detailed research and publication as that of Doncaster. Recent papers have ranged from its palaeontology (Bowden *et al.* 2014; Lomax *et al.* 2015, 2016; Howes 2024), through its archaeology (e.g. Buckland & Dolby 2022) to the detail of its internationally important entomological collections, where some of the few British voucher specimens are held in its collections (e.g. Skidmore 2014).

The former Museum and Art Gallery in Chequer Road, Doncaster, now housing the town's Archives and Local Studies, holds a large collection, over 40,000 individuals excluding exotics, of mounted Coleoptera. Much of the material has locality labels, often also naming collector and date of collection, and is housed in stacks of Hills units. In the 1980s the late Peter Skidmore began the preparation of a list of the museum's entomological holdings, basing the Coleoptera list on an older anonymous card index, perhaps begun by an earlier curator, H. H. Corbert (Limbert pers. comm.). This work remained uncompleted at Skidmore's early retirement in 1995 and was taken up by Buckland in 2017 who added detail from labels into an XLS spreadsheet and where possible located Watsonian Vice-County and National Grid Reference. Many of the identifications had been checked by Skidmore, occasionally assisted by the late Colin Johnson for some groups, particularly his specialist

fields of Ptiliidae, Scarabaeidae, Latridiidae and Cryptophagidae. In the database (on the YNU website at: <https://www.ynu.org.uk/about-the-ynu/publications/download-page/category/9-appendices>) the identifier is listed where known; many others are probably by Skidmore, some by either PCB or Bob Marsh. Some groups, for example, Aleocharinae and Ceutorhynchinae, undoubtedly require additional checking and in the absence of identification labels on many specimens, it is probable that some individual specimens have been placed under the wrong name when returned to drawers after examination, particularly by university students utilizing modern material to identify Quaternary fossils. Several of these were corrected during the preparation of the Collection list. Since Skidmore's retirement, there has been no full-time entomologist in the museum, now library staff and the last natural historian, Martin Limbert, was made redundant in 2011. The responsibility for ecological advice on planning applications and maintenance of biological records had been transferred, along with Colin Howes, to the town's Directorate of Planning in 1986, although still based in the museum. The work moved physically into the Planning Office under the local authority biological records officer, Bob Marsh, upon Howes' retirement in 2008. From a peak in the latter days of the perhaps notorious Elphinstone Forrest Gilmour (1922-2008; see Darby 2022, 252 for a brief biography) in the late 1960s with several staff actively involved in research and publication of the collections, curatorial responsibility has been reduced to two qualified staff to cover all aspects of museum work from displays to conservation of specimens. Inevitably, despite the best efforts of the overworked remaining staff, the entomological collections have suffered damage from Museum beetle attack. Fortunately, the internationally important collection of Cerambycidae, built up (some would say purloined) by Gilmour (Howes 2020), has been moved to the Natural History Museum in London, but the other entomological collections remain under assault, a problem not unique to collections in Doncaster.

History

The origins of the Doncaster collections lie with the erstwhile Doncaster Scientific Society, now the Doncaster Naturalists' Society, founded in 1880, and a local GP, Dr H. H. Corbett, who amassed local archaeological, geological and natural history specimens. These became the core of the municipal collections which were housed in Beechfield House (Cornish Senior 1913), which stood to the west of the present library and museum in Waterdale before being moved to a purpose-built Museum and Art Gallery in Chequer Road in 1962-63, now occupied by the town's archives. Corbett (1856-1921) was something of a polymath and published papers in many fields, including geology (e.g. 1903), palaeontology (1907), botany (1897) and archaeology (1920). He was appointed the museum's part time curator in 1911. His Coleoptera, of which over a thousand specimens, probably almost all local to Doncaster, survive in the Collection, includes now rare species from localities now long gone, including *Melandrya caraboides* (L.) from Wheatley, now a suburban housing estate but then a country house surrounded by parkland. A near complete fossil of the large hydrophilid *Hydrophilus* (= *Hydrous*) *piceus* (L.), labelled from peat on Hatfield Moors, is referred to by Bayford (1903); its modern distribution does not appear to extend north of Norfolk (Foster *et al.* 2018; see also Dinnin 1991).

Corbett's material formed the basis of a collection, which developed to be one of national significance, largely as a result of the collecting activities of Gilmour and Skidmore. Peter Skidmore (1936-2009), perhaps better known as a dipterist, had been appointed as Assistant Keeper of Natural Sciences in Doncaster by Gilmour in 1965, and he was also an accomplished artist (see plates in Skidmore 2006) having previously worked for an entomological supplier in Manchester (Howes *et al.* 2010). Gilmour's personal collection, amalgamated into the Doncaster one, and including much material obtained during his various postings with the RAF during WW2 (the locality name 'Aston' remains a problem since there are at least five Astons in Cheshire), marked a major expansion of the Museum's holdings and his aggressive acquisition policy added much material from older nineteenth century collectors, including Edward A. Waterhouse (1849-1916), estate steward to the Marquis of Ripon at Studley Park, and brother of the better known Charles O. Waterhouse, assistant keeper at the British Museum (Natural History) in South Kensington (Darby 2022). Gilmour's particular interest, beyond an inordinate and sometimes unhealthy fascination with cerambycids (for a fairly sympathetic obituary, see Dowling 2020), frequently lay in sites around his annual holiday destination in North Wales and the interest was shared by Skidmore.

This material forms the basis of publications on the Coleoptera of Merioneth (Skidmore & Johnson 1969); the voucher material is largely split between the Manchester Museum and Doncaster, the latter holding some 1565 mounted and labelled specimens. Skidmore also had interests in the isolated mountain top faunas of the Scottish Highlands (there is no record of the number of Munros he climbed) and added or confirmed several species to the British list from there, including *Othius lapidicola* Kies. from the top of Ben Lawers in Perthshire (Skidmore 1988). One of his other particular interests, the fauna of dead wood, resulted in the addition of material from Sherwood, the New Forest and other surviving or former wood pasture areas. *Ischnomera cinerascens* Pand. was added to the British list from the old 'woodland' around Duncombe House in North Yorkshire (Skidmore & Hunter 1980). The ladybird *Exochomus nigromaculatus* (Goeze), regarded by Duff (2018), as a casual introduction, was collected from what was then an unploughed, at least since the Roman period, area of lightly grazed old grassland at Rossington Bridge south of Doncaster (Skidmore 1985). Whilst it is possible that this specimen reflects an accidental introduction and casual 'escape' from a local garden centre, it may have been a survivor from a largely lost old grassland habitat.

The equally unique specimen of the Elm leaf beetle, *Xanthogalerucella luteola* (Müll.) from Shirley Pool to the north of Doncaster (Buckland & Skidmore 1999) may also be an introduction, although it should be noted that the latter, like the rather more successful (re-)invasion by the Alder leaf beetle, *Agelastica alni* (L.) (Buckland & Buckland 2014) has a Holocene fossil record, and may have been hanging on by the tips of its tarsi in the former landscaped gardens of Owston Hall, a place no stranger to exotics (cf. Limbert 2010, Sanders 2018). Again, the voucher specimens are in the Doncaster Collection. Amongst the other unique material is also the only British specimen of *Mycetophagus fulvicollis* F., from Waterhouse's material and labelled 'in Dall millyard, Rannoch, 6.(18)70'. For many beetles, the nineteenth century material, largely acquired by Gilmour, documents their declining

distribution. Four specimens of the Tansy beetle, *Chrysolina graminis* (L.), neatly remounted probably by Skidmore, are labelled 'Sutton Gaunt' 19.6.(18)98, extend the species former fenland distribution to the Ouse Washlands west of Ely; most recent records are from the other Ouse floodplain near York (Chapman *et al.* 2006), where the other Doncaster material (32), including 29 (!) labelled 'York 8.(19)51, (coll.) A. Smith, comes from; only one, collected by E. Melmore, has more specific and useful habitat data, 'Naburn below lock, on Tansy by River Ouse, 9.(19)41'. Why the Ouse floodplain populations continue to thrive whilst the Fenland ones have continued to decline virtually to extinction is a mystery, which might be solved from the DNA of museum specimens, where they survive (most recently, see Mullin *et al.* 2023).

Soon after his appointment Skidmore developed contact with the local naturalist and conservation campaigner, William Bunting of Thorne (1912-1995), who had already published notes on water beetles from Thorne Moors (1955), and this resulted in additional specimens from the Moors and other localities across the Humberhead Levels, collected over many years. Bunting's and others' collecting resulted in at least 738 individual Coleoptera from Thorne Moors and a further 1502 from Hatfield including material from an extensive pitfall trap exercise on Hatfield Moors in 1992; unfortunately, this was the last major entomological project carried out by Doncaster Museum staff. The results are incorporated in the inventory published by the Thorne and Hatfield Moors Conservation Forum (Skidmore 2006); voucher specimens are in the Doncaster Museum collection.

Gilmour's successor as Museum director, John Barwick (1926-2021), lacked his vision of the importance of collections and research and he, not entirely through his own faults, presided over the decline of the museums service to become a mere adjunct of libraries.

The Database

Abstracting data from labels on specimens and Skidmore's notebooks has proved a daunting task. Most Yorkshire records have been included in the YNU *Atlas of Yorkshire Coleoptera* by Bob Marsh (2007 *et seq.*), which also provides county distribution maps and comments on status and habitat, but other records remain uncollated and specimens of national and international significance were unrecorded. The collection had originally been laid out in the early 1960s using the 1945 checklist of Kloet and Hincks and had, to a large extent, last been updated in line with Pope's (1977) revision with a few changes from the Central European checklist (Lucht 1987). Current usage, however, dictates the re-ordering to the list published and updated by Duff (2018), although this creates a mismatch with the layout of specimens in the drawers. The use of alphabetic order within genera also throws out nearly two centuries of careful morphological comparison but brings the lists into line with the *Palaearctic catalogue* (Löbl & Smetana 2003 *et seq.*).

The database has approximately 22,900 entries, ordered in 17 columns: a) Family (and where useful Subfamily), b) genus and subgenus), c) species + author, d) total number of individuals of each species, e) notes on synonymy, f) Watsonian vice-county (VC), g) region, usually pre-1973 county, h) sub-region, usually city, town or parish, i) locality (where known), j) habitat data from label (where present), k) date of collection, l) collector, m) number of

individuals, n) Museum accession number (where known/present), o) national grid reference (NGR), p) identifier where recorded on data label, and q) other notes and comments on problems of either illegible labels or unknown localities. Unfortunately, there are over 3800 specimens with no, illegible or unintelligible data, although some of these may eventually be tracked down via diaries and record books held elsewhere.

The notes in the synonymy column (e) are largely restricted to enabling modern usage to be collated with labels in the collection drawers, although there are occasional additional comments on taxonomic changes. The Watsonian vice-counties (f) were obtained by plugging the National Grid Reference (Column o, NGR) into the parser provided by the Botanical Society of Britain and Ireland; occasionally this column is occupied by a country name, where non-British material has been added to fill gaps in the collection. Counties (g) are largely pre-local government re-organisation in 1973 in order to correlate with Watsonian Vice-counties. The more detailed locations provided in parish/ town/ city and location are more problematic. Labels range from the so general that it is impossible to specify a vice-county, 'London' being a case in point, to site names within a parish or straddling several parishes; Thorne Moors, for example, includes areas of Rawcliffe and Goole parishes in modern South Yorkshire (VC63), as well as Crowle in Lincolnshire (VC54). A convention has been adopted that includes all these records in South Yorkshire and an approximate centre point allocated from the National Grid. Only the most recent work, pitfall trapping on Hatfield Moors in 1992, has labels with 8-figure grid references and these have been reduced to 6-figure in the tabulation. Often, the Grid Reference, either four or six figure, gives a purely notional location, based on the placing of the place name on the map. In fact, very few specimen labels have anything beyond a place name, which required tracking down. Comments in the final column (q) indicate some of the uncertainties. The use of four or six-figure references is somewhat quixotic but large, now urban areas have been ascribed the former and mid-points selected for reserves and conservation areas, although it should be possible to narrow some of these down further. As well as particularly common names, such as Aston, which have been impossible to narrow down beyond the county which is occasionally noted on labels even if in abbreviated form, specimens labelled 'New Forest' or 'Sherwood Forest' are impossible to place, in the former case even to county.

Welsh and Gaelic place names have often proved difficult to transliterate, often not helped by use of alternate spelling in different languages by different collectors. Tywyn replaced Towyn in Merioneth (= Gwynedd *partim*) and in some collectors' handwriting, the locality 'Illeg.' is particularly common. Some localities have proved untraceable, and it is perhaps singularly unfortunate that the collection site for the oldest dated specimens, two scirtids, *Contacyphon variabilis*, dated 5.1835, in material acquired from E. A. Waterhouse and presumably collected by his father Charles Owen Waterhouse, comes from a place, Ruston Dollsbury, which cannot be found, although Limbert (pers. comm.) points out that there is a Dolbury (*sic*) in Devon. Incidentally, where the date of collection is noted in the form xx.xx.xx, it is interpreted as twentieth rather than nineteenth century. Much of the Waterhouse material has coloured tags which might yield localities by working through the notebooks held in the National Museum of Scotland (Darby 2022). Some of the notebooks of other collectors, who used codes, rather than locality names on labels, survive.

Whilst material Fordham donated to Hull was destroyed during WW2, there is some correspondence in the Liverpool Museum and at least his Yorkshire records should be in the YNU archive (Andrew Grayson, pers. comm.); at least some of his specimens in Doncaster have codes beginning F plus a number so there is some hope. Some more recent material has coding problems, partly brought about by tensions between management and curatorial staff. In an attempt to restrict collecting to within the bounds of the Doncaster district, perhaps concerned at the overwhelming amount of material which required (and largely never was) accessioning, management, with little understanding of the need for reference material, tried to add only local specimens to the collection. Skidmore, very much aware of the requirements of a research collection, used site codes, all listed in his numerous notebooks, on specimen labels. Some of these are obvious, TN is Temple Newsam, near Leeds (Bill Ely, pers. comm.) for example, but NW plus a number for Northern Welsh material remains problematic without carefully considered analysis of notebooks currently held in Doncaster Museum. These will hopefully eventually be deposited in the town's archives. All codes from labels are listed in column (p) of the tabulation.

Relatively few individual specimens appear to have been accessioned and with over 40,000 specimens of Coleoptera alone this is hardly surprising. It does, however, render the collection vulnerable in a world where the importance of voucher material is unappreciated, where even books are seen by librarians as a transient commodity.

Conclusion

The slow decline of the Doncaster entomological collections is perhaps but one symptom of what has been termed the 'Endarkenment', a word which surprisingly goes back to the 1820s (OED), where science, curation and research are starved of resources and expected to pay for themselves in the overwhelming quest for 'value for money', where museums consist of front of house displays and no maintenance of supporting collections – what in the West Midlands would be referred to as 'kippers and lace curtains' or less politely 'furcoat and no knickers'. Some of the problems in the context of the Doncaster collections are discussed by Robinson and Bowden (2013; see also comments in Sanders 2018 on the vertebrate collection) and these have only got worse locally, nationally and internationally. Unlike many aspects of archaeological and geological collections, natural history specimens decay and require active curation or at least regular surveillance and intervention. For some species, the only British specimens are in the Doncaster Collection and are irreplaceable. This extends to important collections of Diptera and Lepidoptera, where detailed lists, as appended here for the Coleoptera, are not available. As the examples given show, careful analysis of the data attached to specimens reveals evidence of declining distributions and expansions, results of climate change and other human induced changes. It would be a tragedy if the only record of the Collection, built up over more than a century, was a bald list of scientific names, localities and long dead collectors. For collections elsewhere, it may already be too late.

Returning to a paper in the Geological Society volume on the value of natural science collections for a concluding quote:

“As these specimens preserved in natural science collections are lost through neglect and lack of support, unique historical records pass to extinction: these events parallel the biodiversity crisis in destroying unique assemblages of complex information.” (Cotterill 1997)

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This project was initially begun as a paper archive by the late Peter Skidmore in the early 1990s and was completed by PCB, who has used the collection for much of his palaeoecological research. It has only been possible with the ready cooperation of museum staff, most recently Peter Robinson and Laura Trinogga. Former curatorial staff, particularly Malcolm Dolby, Colin Howes and Martin Limbert, provided useful additional information and help in tracking down the peregrinations of various collectors, particularly the much maligned Elphie Gilmour, who added much material to the collection by fieldwork, purchase or exchange. Comments from Max Barclay, Joan Buckland, Roy Crossley, Bill Ely, Andy Grayson, Malcolm Greenwood, Bob Marsh, Eva Panagiotakopulu and Peter Kendall are also acknowledged. Collation of the data into the ubiquitous Microsoft xls © spreadsheet only proved feasible with the availability of three other programs, usually used sequentially: Beginning with a place name search, Nearby.org.uk allowed conversion of Lat/Long or postcodes to National Grid, Geohack similarly, and the Botanical Society of Britain and Ireland's database.bsbi.org/gridref.php provided Watsonian Vice-Counties from Grid references; all those unnamed programmers are hereby acknowledged; all errors rest with the author(s), who hope that others will take on similar tasks for other local and regional collections.

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Obituary: Chris Young 1950 - 2024



Chris on a jaunt in Morecambe!

Chris was born in Bromley, Kent, to Earnest and Nellie Young. As an only child he had many free hours to wander around his and family relatives' gardens, including near Windsor Castle. He was always interested in the environment and studied sciences at school. Chris studied Dentistry at Birmingham University, where he also started his love of trainspotting!

After spells of dental work in Cambridge, Hull and London, he secured a registrar position in Sunderland. Chris joined the Durham Naturalists and attended many indoor and outdoor meetings. He married Jenny in 1982 in Orpington, Kent, and she joined him in Sunderland. In 1984 Chris's consultant posts brought them to Keighley. He joined the YNU and took part in some of their meetings when work permitted, leaving Jenny at home with their two young sons!

After full retirement in 2008, Chris was asked to become Honorary Librarian of the YNU. The library was being set up on the top floor of St. William's College near York Minster. Whenever he could, Chris linked up with Albert Henderson on field trips to study lichens. Chris also helped Albert out on student days at Golden Acre Park, Leeds, when the university staff introduced their students to plant identification.

When the library needed to move across the road to Minster Gates, Chris was heavily involved in the relocation and reorganization of their new room, again on an upper floor! He spent a lot of time sorting, cataloguing library stock and entering their details into a Pisces electronic database. Unfortunately the deaths of several YNU members meant legacies of books and magazines needed to be collected from their homes and transported to York. Chris and Jenny were regularly seen trundling suitcases full of these legacies on trains between Keighley and York and up the flights of stairs, to where he was concerned about the strength of the floor at Minster Gates. At least these trips allowed them to visit York Railway Museum or York Gardens before the return train home!

The death of Albert Henderson and then lockdown stopped all Chris's YNU activities. He handed over the library position just before it needed to move again. Chris's last two years were affected by cancer and, after a terminal diagnosis in autumn 2022, he and Jenny spent 2023 revisiting his favourite haunts such as Kew, London Science Museum, Hull, Bempton Cliffs and railway stations! There were also visits to family members in Devon and Gloucester but it was his Yorkshire family who were with him in Airedale Hospital when he died in January.

Chris had a quiet personality but he was very interested in all aspects of natural history. He set up a pinboard for press cuttings etc. about YNU people and loved curating old historical information (e.g. in the age before cars took over from rail and the lengthy process YNU members had to go through to get a reduced rail fare for attending a YNU excursion!)

We are very grateful to Jenny, Chris's widow, for providing images and much of the information used in this obituary.

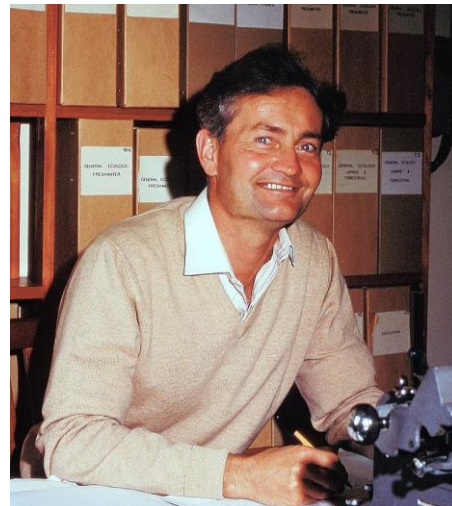
Andy Millard

Obituary: Prof. Geoffrey Fryer, DSc, PhD, FRS, FLS. 1927 - 2024

Geoffrey Fryer was born the eldest son of Willie and Maggie Fryer, both mill workers in Slaithwaite, Huddersfield. Their small tied cottage accommodated not only Geoffrey and his parents but also his aunt, Nellie, and his younger brother, Derek, in what were very cramped living conditions. Geoffrey attended Crow Lane Infants School and then New Street Council School. A local councillor, who had a son the same age as Geoffrey, recognised his abilities and assisted his entry into Huddersfield College, where he studied until the age of 16. He then undertook a three-year apprenticeship at Brook Motors Ltd followed by National Service in the Royal Navy as an electrical artificer. While serving his apprenticeship he met a number of self-taught biologists, who encouraged him in his quest for knowledge. Some of

these men remained friends for life, one of whom gave him a beautiful magnifying glass made by Chadburn Brothers, Sheffield, and which remained a prized possession throughout Geoffrey's life. Another man helped him craft a collecting net with attached tube and extending poles for pond dippings, in retrospect a signpost to where Geoffrey's career would take him.

Following National Service, Geoffrey attended Huddersfield Technical College (HTC) for 4 years where he studied Biology, Zoology and Geography. Alongside this he did a University of London external degree which included a studentship for a year. This was based, in part, at the Freshwater Biological Association (FBA) at Ferry House, Far Sawrey, Windermere, and partly on Loch Lomond, a very primitive hut on the lake shore, linked to the Zoology department of Glasgow University. While attending night school at HTC he met Vivien and they married in 1953. After a honeymoon in their beloved Yorkshire Dales, Geoffrey sailed to Africa, Vivien joining him about two months later. He spent several years studying the freshwater biology of some of the African lakes, focusing particularly on crustacea and fish communities. A consequence of his time in Africa was gaining a PhD from the University of London and the publication of one of his best known books (Fryer & Iles 1972).



Geoffrey Fryer in the 1950s



Geoffrey Fryer, later in life, collecting samples.

In the early 1960s he and Vivien returned to England permanently when he took up a post as Scientific Officer with the FBA at Windermere again. Over the subsequent years he undertook research into many fields of biology but is particularly renowned for important advances into the feeding mechanisms, habits, ecology and evolution of crustacea. He was made a Fellow of the Royal Society in 1972 (Royal Society 2024) and awarded the Linnean Medal for Zoology in 1987 (Linnean Society of London 1987). Although he retired in 1977, Geoffrey continued his research, lecturing and producing publications well into his 80s.

Geoffrey was recorded as a new member of the YNU at its 1949 AGM in Keighley and was already contributing regular records and

articles for publication in *The Naturalist*, which he continued to do for the next 69 years, his last contribution being a short note in 2018 on a historical record of toads eating mice (Fryer 2018)! In 1993 he published his book on Yorkshire Crustacea (Fryer 1993) and was elected President of the YNU. His Presidential Address (Fryer 1994) reflected his broad interest in many different aspects of natural history. However, his curiosity and interests were not restricted to this but included church architecture, history, geography and Christianity. His daughter describes his home as ‘a haphazard collection of books, animal skulls, rocks, photographic and microscope slides and mountains of scientific papers’.

Throughout his life Geoffrey had a healthy respect for people and the world around him and a strong Christian faith. His contribution to the biological sciences and the aims of the YNU have been considerable.

We are grateful to Geoffrey’s daughter, Catherine Thompson, for providing information on his earlier life and to his son-in-law, John, for providing the images.

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Andy Millard

Yorkshire Heteroptera: Part 6, Pentatomorpha 2 – Pentatomoidea

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Introduction

The Pentatomoidea is a Superfamily of the Pentatomorpha within the suborder Heteroptera of the Hemiptera. Many British representatives are phytophagous, some are entomophagous, but none are significant agricultural or horticultural pests. In Britain there are approximately 40 reported species representing five families; at present 28 of these are recorded from Yorkshire.

The following list is the final part which represents currently recorded Yorkshire Heteroptera together with associated Vice Counties, statuses, hosts/habitats and years for the first and latest records. The host data are indicative only as some overwinter as adults on evergreen plants, shrubs and trees, while continental food plants may differ from British records, and some are polyphytophagous. Of the species listed all can be identified without dissection of male specimens. However, some introduced, invasive or immature bugs require more detailed examination including dissection in some cases. Consequently, some bugs cannot be reliably identified, or where specimens are unavailable for examination, such records are indicative only and may not have been validated.

The status convention is based on: 1 to 9 records = Rare; 10 to 24 = Scarce; 25 to 49 = Uncommon; 50 to 99 = Frequent; 100 to 199 = Common; 200 or more = Very Common.

The taxonomy of European Hemiptera is relatively well documented for many countries (Aukema & Rieger 2006; Aukema *et al.* 2013). The Bibliography below includes publications which may assist in the identification of specimens.

Infraorder: Pentatomorpha

Superfamily: Pentatomoidea

Family: CYDNIDAE Billberg, 1820

Subfamily: SEHIRINAE Amyot & Serville, 1843

Tribe: SEHIRINI Amyot & Serville, 1843

Adomerus biguttatus (Linnaeus, 1758)

VC62: rare, a single record of nymphs, cow-wheat *Melampyrum pratense*, 1929.

Legnotus limbosus (Geoffroy, 1785)

VC61, VC62, VC63: uncommon, bedstraws, 2001-2023.

Legnotus picipes (Fallén, 1807)

VC61, VC63: rare, bedstraws, 1953-1992.

Sehirus luctuosus Mulsant & Rey, 1866. (See Fig 1, opposite).

VC61, VC62, VC63: scarce, common forget-me-not *Myosotis sylvatica*, 2009-2023.

Tritomegas bicolor (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: common, white deadnettle *Lamium album* and black horehound *Ballota nigra*, 1968-2023.

Family: THYREOCORIDAE Amyot & Serville, 1843

Subfamily: THYREOCORINAE Amyot & Serville, 1843

Thyreocoris scarabaeoides (Linnaeus, 1758) (see Fig 2, opposite)

VC63: rare, 2004-2023.

Family: ACANTHOSOMATIDAE Signoret, 1864

Subfamily: ACANTHOSOMATINAE Signoret, 1864

Acanthosoma haemorrhoidale haemorrhoidale (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: very common, hawthorns, 1921-2023.



Figure 1. CYDNIDAE
The scarce *Sehirus luctuosus* found at Shaw Wood 21 May 2013 VC63 on forget-me not.



Figure. 2 THYREOCORIDAE
The rare *Thyreocoris scarabaeoides* found at Edenthorpe 24 July 2020 VC63 in a cobweb.

***Cyphostethus tristriatus* (Fabricius, 1787)**

VC61, VC63, VC65: uncommon, Lawson's Cypress *Chamaecyparis lawsoniana*, 1985-2023.

***Elasmotethus interstinctus* (Linnaeus, 1758)**

VC61, VC62, VC63, VC64, VC65: very common, birch *Betula pendula*, 1921-2023.

***Elasmucha ferrugata* (Fabricius, 1787)**

VC64: rare, two records, W.J. Fordham 1921

***Elasmucha grisea grisea* (Linnaeus, 1758) (See Fig 3, p135)**

VC61, VC62, VC63, VC64, VC65: very common, birch, 1921-2023.

Family: SCUTELLERIDAE Leach, 1815

Subfamily: EURYGASTRINAE Amyot & Serville, 1843

Tribe: EURYGASTRINI Amyot & Serville, 1844

***Eurygaster testudinaria testudinaria* (Geoffroy, 1785)**

VC61, VC62, VC63, VC64: scarce, meadow grasses, 2018-2023.

Tribe: PSACASTINI Mulsant & Rey, 1865

***Psacasta exanthematica exanthematica* (Scopoli, 1763)**

VC63: rare, imported on supermarket raspberries from Spain, 2007.

Family: PENTATOMIDAE Leach, 1815

Subfamily: ASOPINAE Amyot & Serville, 1843

Picromerus bidens (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: common, 1921-2023.

Rhacognathus punctatus (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: uncommon, predator on heather beetle larvae, 1929-2022.

Troilus luridus (Fabricius, 1775)

VC61, VC62, VC63, VC64, VC65: common, 1973-2024.

Zicrona caerulea (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: common, 1921-2023.

Subfamily: PENTATOMINAE Leach, 1815

Tribe: AELIINI Douglas & Scott, 1865

Aelia acuminata (Linnaeus, 1758)

VC61, VC62, VC63, VC64: common, grasses, 2006-2023.

Neottiglossa pusilla (Gmelin, 1790)

VC61, VC62, VC63: frequent, grasses, 2000-2023.

Tribe: CARPOCORINI Mulsant & Rey, 1866

Dolycoris baccarum (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: very common, 2004-2023.

Palomena prasina (Linnaeus, 1761)

VC61, VC62, VC63, VC64, VC65: very common, two records prior to 1938 with all others post 1999, 1921-2023.

Tribe: EYSARCORINI Mulsant & Rey, 1866

Eysarcoris venustissimus (Schränk, 1776)

VC61, VC62, VC63, VC64, VC65: common, hedge woundwort *Stachys sylvatica*, 1992-2023.

Tribe: PENTATOMINI Leach, 1815

Nezara viridula (Linnaeus, 1758)

VC63: rare, four records, imported on fruit and vegetables, 1969-2022.

Pentatoma rufipes (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: very common, deciduous trees, 1921-2023.

Tribe: PIEZODORINI Atkinson, 1888

Piezodorus lituratus (Fabricius, 1794)

VC61, VC62, VC63, VC64, VC65: very common, gorse *Ulex europaeus*, 1921-2024.

Tribe: STRACHINI Mulsant & Rey, 1866

Eurydema oleracea (Linnaeus, 1758)

VC61, VC62, VC63, VC64: uncommon, crucifers, 1978-2023.

Eurydema ornata (Linnaeus, 1758)

VC62: rare, single record 2020.



Figure 3. ACANTHOSOMATIDAE
The very common *Elasmucha grisea* found at Edenthorpe, 4 August 2014, VC63, on birch.



Figure 4. PENTATOMIDAE
The rare *Podops inunctus* found at Edenthorpe, 9 October 2015, VC63, swept from grass verge.

Subfamily: PODOPINAE Amyot & Serville, 1843

Tribe: PODOPINI Amyot & Serville, 1843

Podops inunctus (Fabricius, 1775) (See Fig. 4 above)

VC63: rare, grasses, 2014-2022.

Tribe: GRAPHOSOMATINI Mulsant & Rey, 1865

Graphosoma lineatum (Linnaeus, 1758)

VC64: rare, single record, 2016.

Taxonomic Changes since Southwood & Leston (1959) and adopted herein:

Schuh R.T. & Weirauch C. (2020) updated the taxonomy of the Pentatomoidea, family changes are incorporated but not highlighted herein.

Sehirus bicolor (Linnaeus) is now *Tritomegas bicolor* (Linnaeus, 1758).

Sehirus biguttatus (Linnaeus) is now *Adomerus biguttatus* (Linnaeus, 1758).

Eysarcoris fabricii Kirkaldy is now *Eysarcoris venustissimus* (Schränk, 1776).

Eurydema ornata (Linnaeus, 1758) is new to Britain.

Graphosoma lineatum (Linnaeus, 1758) is new to Britain.

Psacasta exanthematica is a none-native import.

Nezara viridula is a none-native import; two Yorkshire records are of nymphs, which suggests that it may become established.

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A list of some British species and selected photographs can be viewed at:
<https://www.britishbugs.org.uk/gallery.html>

Informative articles on British Heteroptera have been published in *Het News* and *The Hemipterist*, available at:
<https://www.britishbugs.org.uk/HetNews.html>
<https://sites.google.com/site/thehemipterist/>

YNU Bryological Section: Report for 2023

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Excursions

Two sectional meetings were held in 2023 and are reported below. Nomenclature follows the latest British and Irish Census Catalogue (Blockeel *et al.* 2021), which introduced a number of name changes from the previous edition.

Spring meeting, Frostrow, Sedbergh (VC 65), 6 May 2023

This meeting was prompted by recent reports of interesting bryophytes in the flushes on the Frostrow Fells, suggesting that further investigation might prove fruitful. We approached the western end of the Fells via Millthrop, and in fact the northern slopes around Burton Hill

kept us occupied for most of the day. Initial interest on the ascent from Millthrop was provided by the presence of *Pohlia elongata* var. *elongata* on soil pockets among turf on the bank of the bridleway. The track then led to a seepage area at SD659908 and SD660908. On the flushed bank of a rivulet we noted *Scapania irrigua*, *Blindia acuta*, *Bryum alpinum*, *Campylopus atrovirens*, *Dicranum bonjeanii*, *Thuidium delicatulum* and, on gravel, *Racomitrium ericoides*. From this interesting place we moved on eastwards through a mosaic of moist, unimproved grassland interspersed with flushes and seepages. The moist grassland, with frequent patches of *Sphagnum*, supported several large leafy liverworts, including *Bazzania trilobata* and *Plagiochila asplenioides*, two species normally associated with woodland. *Ptilidium ciliare* was also present, but particularly exciting was a patch of *Anastrepta orcadensis*, a liverwort with a strongly Atlantic distribution in Britain and near the south-eastern edge of its range at this locality. Other species noted in the turf and at the edge of small rock outcrops included *Frullania tamarisci*, *Schistochilopsis incisa* and *Diphyscium foliosum*, and in moister niches *Breutelia chrysocoma* and *Climacium dendroides*.

There was significant base-enrichment locally in the flushes and seepages, with some fine stands of the three British *Scorpidium* species, *S. cossonii*, *S. revolvens* and *S. scorpioides*. Also present were *Riccardia multifida*, *Campylium stellatum*, *Palustriella falcata* and *Sarmentypnum exannulatum*. Particularly notable were the reddish-purple shoots of *Sarmentypnum sarmentosum*, a northern species of cool climates which is confined in Yorkshire to the north-western Dales. Two *Sphagnum* species characteristic of ground with some mineral enrichment were also present, *S. contortum* and *S. teres*. We spent some time searching for the nationally scarce *Sphagnum platyphyllum*, which had been recorded on these fells in 2022. Some of the promising shoots proved to be small forms of *S. auriculatum*, but we were eventually able to confirm *S. platyphyllum* after microscopic examination. There are very few records at all of *S. platyphyllum* in the north of England, and there is only one other currently known locality in the Yorkshire vice-counties (in the vicinity of Cronkley Scar in Upper Teesdale).

The mire habitats around SD668907 graded into *Sphagnum* bog, and here we noted *Polytrichum strictum* and several small liverworts characteristically found on *Sphagnum* hummocks, notably *Cephalozia connivens*, *Mylia anomala* and *Odontoschisma sphagni*. Further diversity was provided by a small gully feeding into the Clatter Beck. Though marked on the map as a waterfall, this proved to be little more than a tumbling stream, but the exposed rocks on its banks produced small quantities of *Amphidium mougeotii*, *Bartramia pomiformis*, *Blindiadelphus recurvatus* and *Chionoloma tenuirostre*, and Steven Heathcote detected *Pohlia flexuosa* among *Pellia* on wet soil. A tuft of *Ulota calvescens* was noted on the twig of a Gorse bush. Further down along the Clatter Beck we added *Lejeunea lamacerina*, *Metzgeria conjugata* and *Heterocladium heteropterum* on shaded rocks. Epiphytes included *Orthotrichum stramineum*, *Pulvigerella lyellii* and *Syntrichia papillosa*, all on Sycamore.

The total number of species recorded during the day was an impressive 142.

Autumn meeting, Allertorpe Common (VC 61), 18 November 2023

The objective of this meeting was to update the bryophyte records for the Common, especially in view of our highly successful meeting at Skipwith Common in 2017.

The unforested part of the Common, forming the YWT Reserve, is of course very small in comparison with Skipwith, and we encountered only a very limited heathland flora from a bryological perspective. The flora of the dry heathland consisted of common species, principally *Hypnum jutlandicum*, *Kindbergia praelonga* and *Pseudoscleropodium purum*, with occasional *Dicranum scoparium* and *Pleurozium schreberi* among the Heather, and *Campylopus introflexus*, *C. pyriformis*, *Ceratodon purpureus* and *Polytrichum juniperinum* on more open ground. *Bryum rubens* was recorded on peaty soil, *Calypogeia arguta* was noted on rotting *Molinia* thatch and *Calypogeia fissa* on soil on the side of a small dug-out pit. Sandy soil in holes and burrows was colonised by *Dicranella heteromalla* and sparse *Pohlia nutans*. Wet heath in the southern part of the Reserve had plentiful *Sphagnum auriculatum*, small amounts of *S. fimbriatum* and *S. fallax*, and a few patches of *Aulacomnium palustre* and *Polytrichum commune*. A fourth *Sphagnum* species, *S. cuspidatum*, was submerged in pools. Two species of boggy mires, *Sarmentypnum exannulatum* and *Straminergon stramineum*, were present in the wet heath. Both of these are very rare in the East Riding (VC 61) and thus regionally significant. Another regionally rare species, *Dicranum bonjeanii*, was found in a drier part of the heath.

Trees and dead wood added a significant number of species to the Reserve list. Epiphytes on the acid bark of Birch were largely limited to *Dicranoweisia cirrata* and *Hypnum cupressiforme*, but Sallows and young Oaks produced additional species, including *Frullania dilatata*, *Radula complanata*, *Metzgeria furcata*, *M. violacea*, *Orthotrichum pulchellum*, *Plenogemma phyllantha*, *Ulota bruchii*, *U. crispula* and *Zygodon conoideus*, though mostly in small quantity. *Aulacomnium androgynum* was frequent on log piles, and *Brachythecium albicans*, normally a grassland moss, was found ascending a group of logs. Of particular interest was a tiny, incipient growth of *Hylocomium splendens* on one log pile. Although this is a common terrestrial moss in upland parts of Britain, it has declined in many lowland regions from loss of habitat and formerly from acid deposition. The tiny piece observed during the meeting is probably the result of natural re-colonisation.

The small group of trees at the southern end of the Reserve had a few common woodland species, including *Dicranella heteromalla* and *Mnium hornum*, and (on a tree stump) *Orthodontium lineare*. Other common bryophytes recorded at scattered points in the Reserve included *Lophocolea bidentata*, *Atrichum undulatum*, *Calliergonella cuspidata*, *Plagiothecium undulatum* and *Polytrichum formosum*.

Our overall impression was that the heathland had a very closed structure, and that some limited disturbance of the substrate in parts of the heath could provide opportunities for colonisation by pioneer species, some of which might already be present as diaspores in the substrate. There was evidence of high nutrient deposition in the form of algal growth on terrestrial habitats and tree trunks, and this might be another factor inhibiting the growth of oligotrophic bryophytes.

We had some time in the afternoon to examine parts of the forestry plantations adjacent to the Reserve. One compartment of mature conifers was impressively mossy, with some very fine patches of *Plagiothecium undulatum* and smaller amounts of *Thuidium tamariscinum* and *Pleurozium schreberi*. Other records included *Plagiothecium curvifolium* about the base of a Birch tree, *Lepidozia reptans* on a log, and *Dicranum majus* covering an old tree stump. The latter is a very rare species in the East Riding, with apparently only one other recent record. Ditch banks produced *Calypogeia fissa*, *C. muelleriana*, *Pseudotaxiphyllum elegans*, and small quantities of *Pogonatum aloides* and *Pohlia nutans*. One wet ditch had *Leptodictyum riparium*. The paths and woodland rides added several ruderal bryophytes to the list, including *Didymodon fallax* and *Dicranella varia* s.lat. on calcareous hardcore.

The combined total of distinct species in the Reserve and the plantations was 65.

The year's records

The number of records received for 2023 from each of the Watsonian vice-counties is shown below.

Vice-county	Records received
61	102
62	199
63	413
64	298
65	379

My final year as YNU Recorder saw rather low levels of activity in the Yorkshire vice-counties. My own attention in recent years has largely been focussed on the neighbouring county of Derbyshire, and it is therefore fitting that Steven Heathcote should take over as Recorder for Yorkshire from January 2024. I wish him well in his new post.

Three members visited Bransdale in VC 62 in January 2023 and had some interesting finds. The valley has areas of unimproved grassland and woodland, though with relatively few rock outcrops. It was therefore very pleasing to find *Harpanthus scutatus* on a small, embedded boulder in woodland at Stocking Crag. This is a very scarce liverwort in England and Wales (more frequent in western Scotland), and the Bransdale record appears to be only the fourth for the Yorkshire vice-counties in the present century. Also notable in Bransdale were *Brachydontium trichodes*, a tiny moss of moist siliceous rocks, and four liverworts likewise characteristic of siliceous rocks: *Cephalozia lunulifolia*, *Scapania gracilis*, *S. umbrosa* and *Tritomaria exsectiformis*.

During the annual *Sphagnum* survey on Thorne Moors in October I collected a small *Calypogeia* which was subsequently confirmed as *C. sphagnicola*. This scarce liverwort is confined to peat-bogs, usually in association with *Sphagnum*, and its presence on a cut-over part of Thorne Moors is of great interest as a possible survivor of the former intact bog surface. Among other highlights in the county during the year was the discovery of *Hamatocaulis vernicosus* in Wharfedale by Gordon Haycock, a very scarce wetland moss that

has proved to be somewhat more common nationally than it was thought to be 20 years ago, although still very localised and rare in Yorkshire. In December Judith Allinson found *Riccia beyrichiana* on the banks of the River Ribble near Stainforth Foss. It was last seen in Yorkshire near Ingleton in 1992.

Steven Heathcote has made a number of interesting records in VC 63. *Riccardia palmata* is an increasing species of rotting wood, first found in the vice-county at Hardcastle Craggs in 2004 and now discovered by Steven at a second, far distant locality in Brockadale. A visit to Lindrick Dale and Branccliffe Quarry in November confirmed the continued presence of the critically endangered moss *Tortula cernua* on lime waste in the quarry (see Heathcote *et al.* 2024), and produced new records of *Flexitrichum flexicaule* in Lindrick Dale Quarry and Branccliffe Quarry, and *Aloina ambigua* on Lindrick Common. Nearby, at Moses Seat, earlier records of *Marchesinia mackaii* and *Conardia compacta* were re-found, both of them being species of high regional importance.

Selected records

The list below provides details of selected records, including new vice-county records and updates to the national Census Catalogue (identified by an asterisk). The vice-county is given in brackets before each individual record.

***Aloina ambigua*:** (63) SK54288272 on bare stony bank of entrance to road underpass, Lindrick Common, T.L. Blockeel & S.J. Heathcote, 25 November 2023.

***Brachydontium trichodes*:** (62) SE62239482 Hodge Beck in Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023. A nationally scarce moss, with a scattered and fragmented distribution in Britain.

***Bryum alpinum*:** (64) SD9165 Gordale Beck, Malham, C. Kelly, C. Shaw, *et al.*, 9 June 2023; (65) SD64779305 Brant Fell, S.J. Heathcote & S. Reid, 12 December 2023.

***Calliergon giganteum*:** (64) SE14885342 Stainforth Gill, Timble Ings, G. Haycock, 13 January 2023. A scarce moss of calcareous wetlands.

***Calypogeia sphagnicola*:** (63*) SE72691555 growing through *Sphagnum fimbriatum*, Thorne Moors NNR, southern canals area, TLB, 27 October 2023.

***Cephalozia lunulifolia*:** (62) SE62139480 Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

***Conardia compacta*:** (63) SK54588215 Base of limestone crag adjacent to concrete drain in woodland., Moses' Seat, Lindrick Dale, T.L. Blockeel & S.J. Heathcote, 25 November 2023. A very scarce species in Britain, *Conardia* has a strong association with Magnesian Limestone in Yorkshire.

***Dicranum bonjeanii*:** (63) SE72611537 and SE72571532 Thorne Moors NNR, southern canals area, T.L. Blockeel, 27 October 2023. This seems to be only the second record for VC 63 during the present century.

***Dicranum fuscescens*:** (62) SE62119479 Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

***Diphyscium foliosum*:** (64) SE22884817 Lindley Wood Reservoir, G. Haycock, 12 March 2023.

Encalypta pilifera: (65) SE127876 old, flower-rich wall, Middleham Castle, Canaan Lane, Middleham, A. Baker, 7 May 2023. An unusual record of this moss from a man-made habitat. Its natural habitat is on limestone crags and rocks, where it is rare but perhaps under-recorded.

Fissidens gracilifolius: (63) SK53858225 small stone under trees at edge of quarry, Lindrick Dale Quarry, T.L. Blockeel & S.J. Heathcote, 25 November 2023. A tiny moss of calcareous stones and rocks

Flexitrichum flexicaule: (63) SK54138161 in mossy carpet on quarry floor, Brancliffe Quarry, T.L. Blockeel & S.J. Heathcote, 25 November 2023; (63) SK540821 and SK539821 locally abundant in mossy carpets on thin soil over limestone, Lindrick Dale Quarry, T.L. Blockeel & S.J. Heathcote, 25 November 2023. The only other recent record of this calcicole moss in VC 63 is from nearby Lindrick Common in 2000.

Hamatocaulis vernicosus: (64*) SE13665303 Gawk Hall Gill, Denton Moor, G. Haycock, 13 January 2023.

Harpanthus scutatus: (62) SE62139480 Stocking Crag, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

Homalothecium lutescens: (63) SK5482 Lindrick Dale Quarry (eastern end), T.L. Blockeel & S.J. Heathcote, 25 November 2023.

Lophocolea semiteres: (63) SE32881413 Seckar Wood, S.J. Heathcote, 13 May 2023. An introduced liverwort which is gradually becoming more frequent.

Marchesinia mackaii: (63) SK54198214 several patches on face of limestone crag, Moses' Seat, Lindrick Dale, T.L. Blockeel & S.J. Heathcote, 25 November 2023.

Mesoptychia collaris: (63) SK54058210 thin stony soil on face of rock ledge, Lindrick Dale Quarry (eastern end), T.L. Blockeel & S.J. Heathcote, 25 November 2023. A new locality for this liverwort of calcareous rocks, which is very rare in VC 63.

Microbryum davallianum* var. *conicum: (63*) SE50821717 trampled path in rank CG5. SH1610a., Brockdale Nature Reserve, Horse field, S.J. Heathcote, 16 October 2023. Var. *conicum* has only recently been reinstated as a distinct variety in Britain, and this record confirms its presence in VC 63.

Pellia neesiana: (63) SE58980025 Potteric Carr Nature Reserve, S.J. Heathcote, 30 April 2023. This *Pellia* is rare in lowland habitats.

Plagiothecium denticulatum* var. *denticulatum: (63) SE32721402 Seckar Wood, S.J. Heathcote, 13 May 2023. As a strong acidophile, this moss has declined in recent decades following reductions in SO₂ pollution.

Racomitrium elongatum: (65) SD66319408 and SD65519340 Brant Fell, S.J. Heathcote & S. Reid, 12 December 2023.

***Racomitrium heterostichum* s.str.**: (65*) SD6690 on dry-stone wall, western end of Frostrow Fells, northern side of Burton Hill, C. Shaw with YNU, 6 May 2023. Although *R. heterostichum* is well-known and widespread in upland districts, the recent segregation of *R. obtusum* requires re-recording of *R. heterostichum* in its new narrow sense.

Racomitrium obtusum: (62*) SE62229616 large sandstone boulder, Clegret, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

Riccardia palmata: (63) SE50331740 Ash-Sycamore woodland, rotting log in piles of cut birch., Brockdale Nature Reserve, Compartment 8, S.J. Heathcote, 16 October 2023.

Riccia beyrichiana: (64) SD81726684 very shallow soil in depression on top of flat limestone rock, West Bank of River Ribble below Stainforth Foss, J. Allinson, 15 December 2023.

Scapania gracilis: (62) SE62139480 Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

Scapania umbrosa: (62) SE62139480 Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

Sphagnum contortum: (65) SD64699309 and SD64669301 Brant Fell, S.J. Heathcote & S. Reid, 12 December 2023.

Sphagnum flexuosum: (63) SE32641414 Seckar Wood, S.J. Heathcote, 13 May 2023.

Splachnum sphaericum: (64) SD9165 Gordale Beck, Malham, C. Kelly, C. Shaw, *et al.*, 9 June 2023.

Syntrichia papillosa: (62) SE62199626 Clegret, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023.

Thuidium delicatulum: (65) SD65729336 Brant Fell, S.J. Heathcote & S. Reid, 12 December 2023.

Tortula cernua: (63) SK54118160 low, weathered spoil heap on quarry floor, Brancliffe Quarry, T.L. Blockeel & S.J. Heathcote, 25 November 2023.

Tortula subulata: (63) SE68592346 silty soil at tree base, River Aire at Rawcliffe, S.J. Heathcote, 28 January 2023. Although sometimes occurring as a riparian moss of silty tree bases, it has not previously been reported from the lower reaches of the R. Aire. Most of its records in VC 63 are from the Magnesian Limestone.

Trichocolea tomentella: (64) SE18635066 Dob Park Wood, L. Wildwood, 24 October 2023. A welcome new locality for this very distinctive liverwort of wet ground and flushes, often in woodland. There are very few recent records from the Yorkshire vice-counties.

Tritomaria exsectiformis: (62) SE62289483 locally abundant on field side and top of wall, Stocking Craggs, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023; (62) SE61729544 Land above Low Elm House, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023; (62) SE62179622 Clegret, Bransdale, S.J. Heathcote, T.L. Blockeel & G. Haycock, 14 January 2023. This liverwort was found to be widespread in Bransdale during the visit in January 2023. It occurs on sheltered siliceous rock surfaces.

Thanks are due to all the contributors of records.

References

- Blockeel, T.L., Hodgetts, N.G. Pilkington, S.L. & Pescott, O.L. (2021) A census catalogue of British and Irish Bryophytes 2021. British Bryological Society.
- Heathcote, S., Blockeel, T., Hill, L., Coe, L. & Higginbottom, T. (2024) The critically endangered Flamingo Moss *Tortula cernua* is still present at Brancliffe Lime Works. *The Naturalist* 149: 50-52.

City Nature Challenge 2024 - Hull

Lucy Baldwin

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Monday 6th May marked the end of the 2024 City Nature Challenge, a global bioblitz event in which the city of Hull took place for the second year, organised by the North and East Yorkshire Ecological Data Centre with the help of Yorkshire Wildlife Trust, the University of Hull, The Deep, and other partners. The recording weekend ran from the 26th to the 29th April, where globally 2.4 million observations of over 65,000 species were made across almost 700 city regions.



Figure 1. Water Vole and Little Egret recorded on iNaturalist during the Hull City Nature Challenge.

This year's event in Hull was a great success, seeing the city placed 7th for number of observations and 6th for number of species recorded, out of 24 participating UK regions. This placed Hull in the top third of participants in the UK for both parameters. A total of 7,047 observations were recorded during the event, an increase of over 2,800 records compared to 2023, where observations totalled 4,170. The number of species recorded also increased significantly between 2023 and 2024, an increase of 349 species to total 1,188, a fantastic effort for a small, urban recording area. Of the 1,188 species recorded over the City Nature Challenge weekend, plants were the largest taxonomic group represented (43%), totalling 507 species. Insects were the next largest group (23%) with 207 species recorded, followed by fungi (15%) with 179, birds (5.7%) with 68, arachnids (4.1%) with 48, and molluscs (3.1%) with 36. Mammals and amphibians made up the bulk of the remainder.

2024 saw us record across a wider range of taxonomic groups than 2023, with more species represented in each group. The biggest change was in the recording of fungi, where we had a wonderful array of species recorded, 179 in total, compared to 36 in 2023.

Some species highlights for Hull included Lesser Whitethroat (*Curruca curruca*), Barn Owl (*Tyto alba*), Kingfisher (*Alcedo atthis*), Water Vole (*Arvicola amphibius* – one of only 5 recorded across the UK during the challenge!), Little Egret (*Egretta garzetta*) (Fig. 1, p143), Cetti's Warbler (*Cettia cetti*) and Brown Hare (*Lepus europaeus*). Protected and priority species were also recorded, including Great Crested Newt (*Triturus cristatus*) and Common Pipistrelle bat (*Pipistrellus pipistrellus*). One of our insect recorders also found a species new to Yorkshire in Hull over the CNC weekend. We can't reveal the name of this species yet whilst the finding is being written up and confirmed, but this really does demonstrate the amazing recording potential of bioblitz events to Hull's recording area which matched that of its city boundaries and was vastly smaller than most other UK regions taking part in the challenge – one of only three regions with a combined area of less than 99km². As such, in Hull, recorders averaged 86.47 observations and 14.47 species per km², significantly higher than the averages for the top three city regions in the UK leaderboard.



Figure 2. Two examples of technology used in the Hull CNC: camera trap (above); bat detector (below)

Overall, there was a good spread of recording effort across the city, using a variety of technologies (Fig.2). Areas included Hull's parks (Alderman Kneeshaw, East Park, Pearson Park, Pickering Park), Noddle Hill Local Nature Reserve, green spaces such as General and Western Cemetery, allotments, along the Humber at sites like The Deep and St Andrew's Quay, the University of Hull campus, playing fields, golf courses, disused railways, and more.

Records were made by 67 individuals, experienced naturalists and members of the public alike.

Our top three individual recorders contributed remarkable numbers of observations and species, not just with regards to recording in Hull but also across the entirety of the UK event:

1. Hootinghoopoe (Africa Gomez): 1,093/310
2. Phill-robinson (Phill Robinson): 910/282
3. Andydonegan (Andy Donegan): 702/294

The records collected during the Hull CNC which reach research grade (those where their ID has been agreed by multiple parties on iNaturalist, or verified by NEYEDC) and have the right

licensing attached, can go on to inform local decision-making in the area and be utilised in conservation and research measures. NEYEDC's database holds comparatively fewer records for Hull than other regions across North and East Yorkshire, so the City Nature Challenge, both in 2023 and 2024, has been a valuable method of increasing our data coverage and understanding of the biodiversity in Hull.

NEYEDC would like to say a huge thank you to all who contributed to the City Nature Challenge in 2024. We plan for the City Nature Challenge to return next year and look forward to engaging more people across the region with this great initiative!

City Nature Challenge 2024 – York

John Terenzini

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The City Nature Challenge (CNC) 2024 from 26th to 29th April 2024 was the first time the City of York participated in this global biodiversity recording challenge, which has been taking place annually since 2016. As so many people care about local wildlife, many grassroots and regional organisations were interested in participating in the City Nature Challenge. Overall, 26 community groups and organisations, like the River Foss Society (Fig.1), Yorkshire Wildlife Trust, and the City of York Council, partnered with many others, some of whom showcased their support on the York City Nature Challenge website (City Nature Challenge 2024) as partners with their logos. Many York organisations put on events during the City Nature Challenge, with 28 different events organised by 11 community groups and organisations, an amazing show of support!



Figure 1. River Foss Society event.

To support the events occurring, we delivered seven iNaturalist training sessions to University of York students between January to mid-April 2024, to enable them to co-facilitate community organisation-led events during the York CNC. From that trained group, 15 students were able to bring their newly developed skills to at least one of the 28 different York CNC events. Additionally, organisations like the Foss Fairy Trail, Friends of Hagg Wood, York College and Refugee Action York received bespoke training for their members and volunteers, increasing their community's comfort with smartphone technology (the

iNaturalist app – Fig. 2) and doing biodiversity citizen science in the outdoors.

The launch event on the 26th of April was very well attended and sparked the competitive spirit for everyone to look out for and record observations of the local wildlife, especially for the common species that often get overlooked, such as the city's pigeons and weeds in pavement cracks! One participant shared how "it was a great opportunity to quickly learn about the range of nature along and around the River Foss. Almost instant feedback on identifications is very rewarding. I also now have a library of identified images of plants specific to the local area. It's like a bespoke field guide!"

Given all the enthusiasm across the four days of the challenge, even though it was York's first year to participate, the city did tremendously well in being 1st out of all the 24 UK participating cities for the total number of species observed (1,481 species)! York came 2nd for total observations made (12,835, losing out to Birmingham by only 26 observations!), and 3rd for number of observers (losing out to the big cities of London and Bristol/Bath, who have a population in the millions, compared to York)! An unexpected, but especially encouraging outcome was how many non-specialists, especially students who simply like nature, volunteered their time during the identification meeting of the York CNC, learning from the ecologists and species specialists in attendance, such a stimulating learning atmosphere! The University of York's Living Lab Biodiversity Management Committee has been so impressed with the results of this Programme and the York CNC that they are considering to officially co-lead this annual initiative as it supports the campus Biodiversity Action Plan, while other local groups and institutions are also keen to help in co-leading the organisation of the next York City Nature Challenge.



Figure 2. Making observations with the iNaturalist app.

References

City Nature Challenge (2024) York City Nature Challenge. Available at: <https://yorkcitynaturechal.wixsite.com/yorkcnc>. [Accessed 07/07/2024].

NOTICE: Request for Bog bush-cricket records

Sarah Tucker is currently completing a Masters by Research at the University of Hull, supervised by Dr. Africa Gómez. The project involves surveying Bog Bush-cricket, *Metrioptera brachyptera* (see photo below) in known populations and potential suitable habitats in Yorkshire using acoustic monitoring techniques. The research is partially funded by a YNU grant and the results will be published in *The Naturalist*. Bog bush-crickets are brown or green with green undersides, and can be recognised by the cream band on the rear of the pronotum (see photo), and tend to be associated with areas of damp heath with cross-leaved heath, *Erica tetralix*, including rides in plantations.

Sarah is kindly requesting that if anyone has any old or recent records of Bog Bush-crickets they email them to her at S.TUCKER-2020@hull.ac.uk. Any records are valuable in the search for suitable habitat and surveying sites for Bog Bush-Crickets.



NOTICE: Vacancy on YNU Executive Committee

There will be a vacancy on the YNU Executive Committee from this year's AGM on 16 November (see p.148). The Committee would welcome anyone interested in assisting with the YNU's social media, initially Facebook and X (Twitter). For further details please contact the Chair: editor@ynu.org.uk

Yorkshire Naturalists' Union AGM Day

Saturday 16 November 2024

Location: Barnsley Library (newly opened) @ The Lightbox, town centre Plaza.

- Less than a 5 minute walk from Barnsley Interchange (rail and bus).
- Plenty of town centre parking - on Saturdays, free for first 3 hours in municipal car-parks, thereafter 50p per half hour.



PROGRAMME FOR THE DAY

10.45am: Welcome and short presentation by our hosts, Barnsley Naturalist & Scientific Society (BNSS).

11.15: Members are invited to visit the planned unveiling of a Blue Plaque for the naturalist Thomas Lister, (1810-1888)*, prominent member of the Yorkshire Naturalists' Union and also a poet, recently celebrated by the current Poet Laureate, Simon Armitage.

12 noon: Own packed lunch in

Library (tea and coffee provided) or cafes available in town centre, including Falco Lounge, directly connected to Library, & Market Kitchen above market building opposite Library.

1:15pm: Group photo in Library

1.30pm: AGM

2.30pm: Presidential Address by Mr Jeff Lunn, on **A Sense of Place, A Sense of Purpose.**

3.30pm: Close of meeting (Library building closes at 4pm)

Booking will be via a link on the YNU website, available in September. Please indicate whether you wish to attend the morning unveiling as well as the AGM or to attend the latter via Zoom. We hope as many of you as possible will be able to attend in person.

For those of you without internet access please notify the Membership Secretary (c/o NEYEDC, Unit 7, Hassacarr Close, Dunnington, York YO19 5SN; Tel. 01904 641631) of your intention to attend the AGM and, if desired, the morning event.

* Subject of an article in a forthcoming *Naturalist*.

The Chinese Mitten Crab in the Humber catchment: 75 years of quiet conquest

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Introduction

It is 75 years since the Chinese Mitten Crab, *Eriocheir sinensis* H. Milne Edwards, 1853, was first noticed in Yorkshire waters, when a young angler from Castleford caught one in Southfield Reservoir (SE6518), a compensation reservoir for the adjacent Aire/Calder Navigation (Limbert & Wall 1983). This Citizen Science project, initially based at Doncaster Museum, reviews its spread to tidal river catchments, canal and drain networks associated with the Humber estuary, Humber-head Levels, Yorkshire Ouse and the lower Trent. It also seeks to review information on the seasonality of spawning migrations.

Origins The Chinese Mitten Crab is a native of East Asian waters, most commonly the river systems and estuaries of north and southeast China, Japan and the Korean Peninsula (Internet ref. 1)

Invasive alien in European Waters Adult crabs were first noticed in 1912 in the river Aller near the German town of Rethem (Lower Saxony), then in the River Elbe in 1914. These were thought to have been transported to continental Europe as planktonic larvae in ballast tanks of international shipping. By the 1930s the species had spread via river systems and canal networks throughout northern Europe, occurring especially in the estuaries of the western Baltic and the northern North Sea. It also penetrated far inland, for example into the Czech Republic (Internet ref. 1). Its range now extends from the Atlantic coast of Spain and Portugal, to the Baltic coasts of Sweden and Finland (Herborg *et al.* 2003). It is established in the Black Sea and has appeared sporadically in the Mediterranean, Caspian and White Seas (Internet ref. 2). The International Union for Conservation of Nature has cited *Eriocheir sinensis* as one of the world's worst 100 invasive species. Outside their native range, this alien species has had adverse impacts, both ecologically and economically, on river catchments (Morritt *et al.* 2013).

Life History Maturation is achieved in fresh water at 2 to 3 years in China, and 4 to 5 years for cooler parts of northern Europe (Herborg *et al.* 2005). They tolerate a wide range of salinities and temperatures, growing actively in temperatures from 7 to 30°C (Anger 1991). Mitten crabs are catadromous, adults migrating downstream for spawning in estuarine and coastal waters in late autumn (Anger 1991). En route, they can survive out of water for up to 70 hours, giving them the facility to circumvent engineering obstacles such as dams and sluices (Internet ref. 2).

Adult females in brackish and coastal waters carry their sponge-like mass of fertilized eggs under their abdomens for about four months, until the eggs hatch into spiny larvae (zoeae). Adults die after spawning (Anger 1991). The swimming planktonic zoeae which require

salinities of 15-30 ppt (parts per thousand) for successful development, disperse by tides and marine currents. Over 1 to 2 months they moult through five stages, before metamorphosing into the crablike megalopa stages which show a preference for intermediate salinities of 15-25 ppt, moving back into estuarine waters in late spring. The final megalopa stage metamorphoses into the first of the juvenile crab stages. These may spend their first winter in brackish water before migrating upstream, assisted by inward tidal currents, finally moving into non-tidal fresh-water stretches of rivers, streams and drains where they feed, grow and mature, moulting 10-12 more times (Anger 1991).

First British and Yorkshire Records Chinese Mitten Crabs were first identified in British waters in 1935 in the Thames catchment at Battersea and Chelsea. By the 1980s they had been recorded at West Thurrock Power Station, the Regent's Canal Dock and at Teddington Lock (Clark 1984). A large population is now well established in the Thames catchment, its distribution spreading to Boverney Lock, west of Windsor, Berkshire by 2007 (Clark *et al.* 2008) and to Sutton Courteney, Oxfordshire by 2010 (Morritt *et al.* 2013). The phenomenon of accumulations of Mitten Crabs periodically clogging the intake screens of London's drinking water treatment plants has led to a major analysis of its population demographics and seasonal migratory patterns in the Thames catchment (Morritt *et al.* 2013).

The first Yorkshire encounter was in 1949 in Southfield Reservoir. The specimen was translocated to a 'fenced off' section of a stream near Hollywell Wood, Glasshoughton, but it disappeared a few days later (Limbert & Wall 1983).

Yorkshire and Humber Catchment records 1970s to 1990s. The actual colonisation of the Humber and its tributaries into Yorkshire and south into the Midlands evidently commenced during the 1970s and 80s, initially noticed by licenced eel nets-men then by recreational anglers. In 1976 and 1979 specimens were found in eel nets on the south Humber shoreline near the River Ancholme outlet (SE9721, SE9821) and in 1984 one was actually located in the Ancholme itself (SE9720) (Clark 1984). On 1 July 1986 one was caught in a fyke net low down on the Humber shore between Immingham and Grimsby (TA24) indicating the establishment of the seaward spawning migrations.

In 1984 evidence came from eel nets-men working the Blacktoft-Faxfleet area of the estuarine Ouse/Humber confluence (SE82) (Mel Todd pers. comm.). In October 1985, angler Peter Kitwood caught a Mitten Crab with a leg-span of 23cm in the Market Weighton Canal (SE8627), its identity confirmed by Nature Conservancy staff in York (*Hull Daily Mail* 19 October 1985 p.31). Later that month the same angler caught a specimen with a 25cm leg span in the Keadby Canal at Crowle (SE7810) (*Hull Daily Mail* 30 October 1985 p.6).

In July 1986 one was found in the Ouse at Selby (SE6132) and kept in an aquarium by river authority staff. The Yorkshire Rivers Authority had also received anecdotal reports of occurrences in the River Ouse at Barlby (SE6234) and from the lower River Derwent (SE7030) (*Hull Daily Mail* 19 July 1986 p.9; 1 August 1986 p.8). The same year one was found further up the tidal Ouse at Cawood (SE5738) (Fryer, 1993).

By September 1991 numbers of specimens were being caught in eel traps at Cawood and elsewhere (*Hull Daily Mail* 9 September 1991 p. 18). These included 'a colony' found in the River Wharfe (presumably the lower reaches) (Fryer 1993). On 1 October 1995 one was caught on rod and line in the New Junction Canal, Kirk Bramwith, Doncaster (SE6111). After being examined by Environment Agency biologists it was donated to Doncaster Museum by Chris Firth (EA Fisheries Officer) (Accession no. DONMG ZZ.267). This specimen was exhibited at the YNU Conference on the *Freshwater Ecology of Yorkshire* March 2001 (Howes 2003).

Distribution into the 21st century. Available records between 2000 and 2022 have been arranged in chronological order within specific tidal rivers, tributaries, canals and drainage networks in Appendix 1.



Figure 1: Male Chinese Mitten Crab from the River Don at St Mary's Bridge, central Doncaster 17 September 2008. Photo: Pip Seccombe.

Coastal records Adult crabs on the east coast, presumably having migrated from Humber catchment populations to disperse planktonic zoeae in sea water and to live out their post-spawning period, were first noticed in Bridlington Bay with an unconfirmed report in 2008 followed by a live specimen found in 2009 (Whittaker 2009). Subsequently, singles have been encountered at South Landing, Flamborough (TA232691) 2 September 2012 and in Robin Hood's Bay (NZ957040) on 7 July 2013 (Anthony Hurd, Shorewatch). On 12 March 2013 a male was caught at the mouth of the Humber on Cleethorpes Beach (TA326068) (Donald Johnson).

Eriocheir sinensis H. Milne Edwards, 1853 (Decapoda,
Varunidae) in Watsonian Yorkshire, Co, Durham & North
Lincolnshire

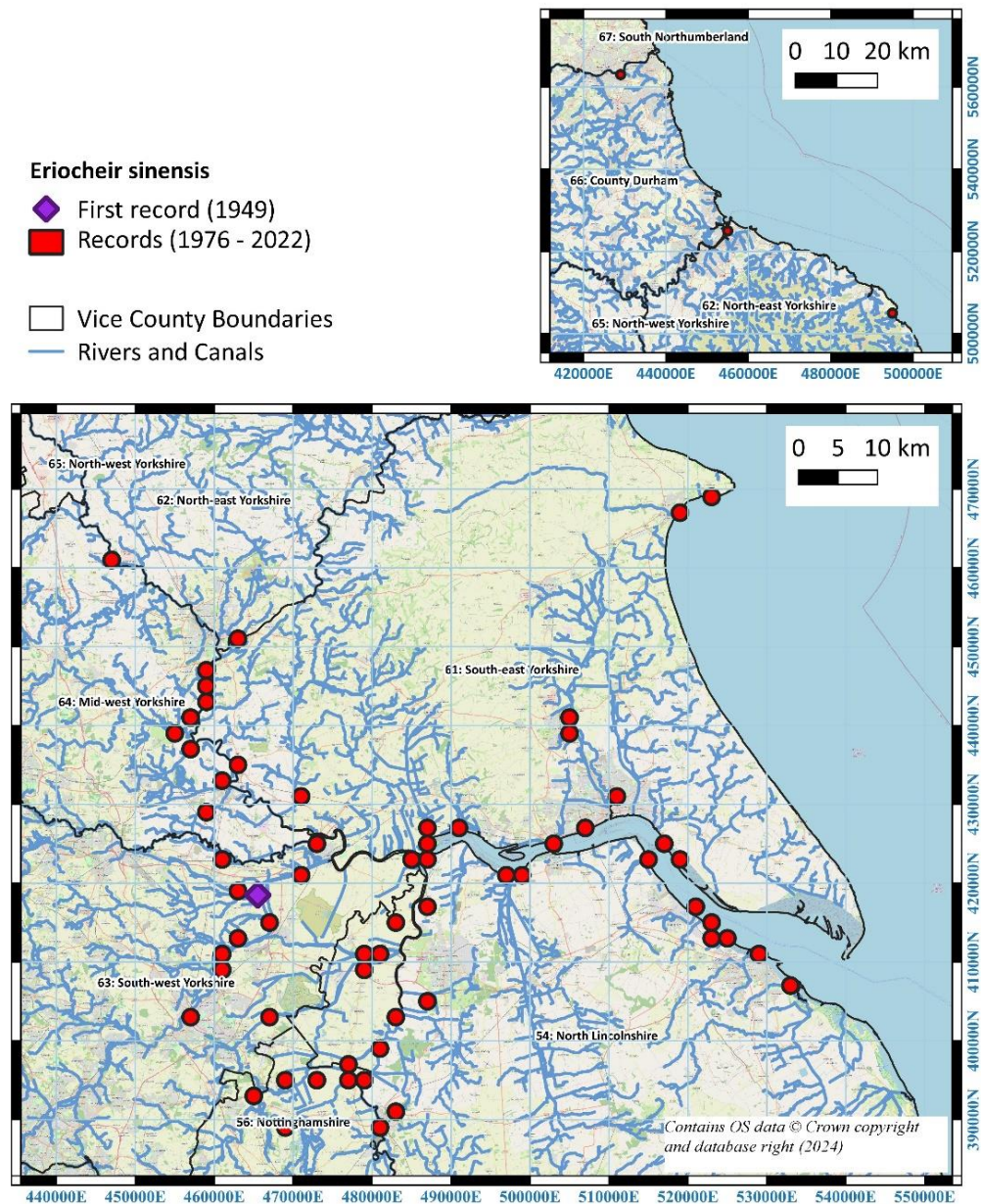


Figure 2: Aggregation of records since 1949. First record (Southfield Reservoir) indicated by the blue diamond. (Map generated by Richard Wilson, YNU Other Arthropods Recorder.)

Either through introduction in ballast water by shipping or by migration of planktonic zoeae from the Humber estuary population, an adult was encountered in the Tees estuary (NZ52) in 2001 (Dr Matt Bentley, Newcastle University). Adults have also been encountered in the Tyne estuary (NZ36) where specimens were collected in the early 1990s (John Hall; Tyne & Wear Museums have four specimens, two each in two jars Acc. Nos. 2009. H139.1 & 2), January 2001 (Wilkinson, 2001), 1 January 2003 (G.D. Stentiford) and on 14 April 2017 (NZ284630) (Lee Donaldson).

Colonisation by decade (1940s to 2020s) and cumulative distribution

In assembling casual records per decade from the current text and Appendix 1, Table 1 shows that the numbers of occupied 1km squares per time period grew to 27 in the 2010s.

Table 1: numbers of localities occupied per decade. (* to 2024)									
Decade	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s	2020s*
Localities (1km ²)	1			2	9	3	8	27	14

However, in the absence of a standardised repeatable survey methodology, perhaps a more realistic impression of maximum recorded colonisation would be the aggregation of recorded sites as shown in the distribution map in Figure 2 (p.152) which shows that over the 75 years of its reported occurrence, Mitten Crabs have been cumulatively recorded from 72 1km squares within this Yorkshire and Humber study area.

Population density Although spot records give evidence of historical distribution (see Figure 2), angler’s anecdotes give greater detail of abundance, such as Gary Park’s experience while fishing in the Market Weighton Canal on 10 September 2021 “every time I put a bait in the water anywhere on a 3-mile stretch, its met with a Mitten Crab”. With the capture of a single specimen in the heart of Doncaster on 17 September 2008 engendering the press headline “River Don crawling with Chinese crabs” (Offord 2008), such extravagant statements would seem to exaggerate the situation. However, Gary Lee’s count of 734 specimens caught in eel traps along a 13-mile stretch of the river Idle during August to September 2013 and approximately 1000 caught in eel traps at Owston Ferry in the lower Trent in January 2018, demonstrated that population densities could indeed be substantial.

Biometrics

Of specimens sampled from the River Idle during August and September 2013, the carapace widths ranged from 8 to 10cm for females and 10 to 12cm for males (Gary Lee). Other carapace measurements were 5cm at Blacktoft Sands 29 July 2019 (Darren Johnson), 7cm from a male in the Don 17 September 2008 (C.A. Howes) and 8cm in the Ouse at Naburn Lock 20 August 2019 (Jim Barrett). The leg-span measurements were 22.8cm at Naburn in September 2013 (Julian Marshall), 23cm in the Market Weighton Canal and 25cm in the Keadby Canal, both in October 1985 (Peter Kitwood) and 30cm from a male in the River Don 17 September 2008 (C.A. Howes) (Fig.1, p151).

Seasonality of spawning migrations

Apart from the example of a crab seen crossing grassland between the Brick Pond and the lower Trent at Burton on Stather on 8 October 2021, migratory movements take place out of sight underwater. Of the 66 records where month of occurrence was noted, Table 2 shows that the majority of encounters (40) took place during the months of September to November. If angling and eel-trap records are indeed sampling crabs on the move, then Table 2 may be monitoring the autumnal seaward spawning migration of this catadromous species.

Table 2: Monthly occurrences											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	1	4	1	1	5	5	5	16	7	17	2

In that Table 2 appears to be identifying two autumnal peaks, September and November, this may be an indication of migration taking place in two waves.

The Thames study (Morritt *et al.* 2013) demonstrated that adult Mitten Crabs, intercepted by the intake screen at Walton-on-Thames water pumping station, had a migration period lasting approximately two and a half to three months. Further, this study provides evidence that proportionately more female mitten crabs move later during the migratory period. This may give an explanation of the November peak in this study.

Various sources, e.g. Naylor (1985), Palmer (1995) and Christy (2011) show that in crabs the most common patterns of breeding migrations and larval release take place when nocturnal ebb tides reach their maximum amplitudes, usually corresponding to spring tides near the dates of the new and or full moons. Following the presumption that the phases of the moon might be the trigger for the seaward migratory movement of the Humber catchment population, Table 3 compares the dates of individual records (not including eel trap totals) with the illuminated proportion (%) of the lunar disk (0-9% = New Moon, 90-100% = Full Moon).

Table 3: Number of crabs encountered compared with % of Lunar disk illuminated.										
% of lunar disk illuminated	<0-9%	10-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-100%
	6	7	7	2	5	2	1	4	2	16

This preliminary exercise shows the largest accumulation of records (16) coincides with full moons with 90 to 100% of the lunar disk illuminated. Interestingly the anecdote of approximately 1000 Mitten Crabs caught in eel traps on 2 January 2018 in the Trent at Owston Ferry coincided with a full moon with 100% of the lunar disk illuminated.

Although there are many records of adult crabs having reached the brackish waters of the lower Humber estuary, this study has only one report of a female carrying a cluster of fertilised eggs, this from Stallingborough on 8 March 2021.

Conclusions The results of this preliminary recording project based on random, casual records accumulated over several decades has charted the history and distribution of *E. sinensis* in the Humber, Ouse and Trent tidal river catchments. It has provided evidence of the successful completion of its catadromous life cycle and the establishment of a self-sustaining population. It has also revealed the seasonality of the seaward spawning migration and indicated the means of triggering this synchronised behaviour.

Following the revealing work of Morritt *et al.* (2013) on the Thames Mitten Crab population, future studies in the Humber catchment should be focussed on seasonal accumulations of specimens on debris screens at river-side Power Stations (such as Keadby, Drax or Immingham) or weed-screens at Drainage Board Pumping Stations. This could provide more systematically acquired and larger volumes of data for the interpretation of population demographics and seasonal migratory patterns.

Is this Diamond Jubilee of the Mitten Crab in the Yorkshire and the Humber region to be celebrated as a biodiversity enrichment and the development of a niche human food source, or is this invasive organism from a distant zoogeographical region simply causing problems by damaging river banks, blocking intakes to power stations and water pumping stations and creating further problems for our native aquatic fauna? These matters are discussed in Clark *et al.* (2008), Dittel & Epifanio (2009) and Clark (2011).

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Thanks are also due to the late Pip Seccombe (Doncaster Naturalists' Society) for photographing the specimen in Figure 1 and to Richard Wilson (YNU Other Arthropods Recorder) for preparing the distribution map.

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Appendix 1.
Gazetteer of Chinese Mitten Crab locations and records in the Yorkshire and Humber area 2000 to 2022

Humber Estuary (North Bank)
12 June 2003 Paul Sands (TA1724) (Environment Agency). 1 January 2008 Paul Sands (TA1724) (Environment Agency). 22 July 2017 an adult was caught on rod and line at Humber Bridge Country Park (TA023252) (Tim Webster). 28 November 2021 5 adults caught on rod and line during an angling match at St Andrews Quay, Hull (TA066264) (Hayden Whiteford). 27 December 2021 St Andrew's Quay, Hull (TA067265) (Chris Dunhill).
River Hull
3 November 2016 caught in eel trap in the River Hull (TA0541) (Gary Lee, Eel netsman). 3 November 2016 caught in eel trap in the Beverley Beck (TA0539) (Gary Lee).
Elleker Beck
10 June 2019 Sand Lane Bridge, Mires Beck, Elleker (SE915279) One exoskeleton and two live crabs (Mike Lee).
Market Weighton Canal
10 September 2021 Market Weighton Canal at Broomfleet (SE8725) "every time I put a bait in the water anywhere on a 3-mile stretch, its met with a Mitton Crab" (Gary Clarke). 16 June 2022 Market Weighton Canal (SE869270) (Alan Mainland).
Humber Estuary (South bank)
17 March 2012 Grimsby (TA290108) 12 were caught in fyke nets at low water mark (Ian Bell). 21 September 2016 East Halton Marshes (TA143227) 1 in a fyke net set on spring tide (Anita Franko). 2 October 2019 Alkborough Flatts (SE8722) 2 caught (identified by Andrea Mcgrath). 8 March 2021 Stallingborough (TA2016). Female carrying cluster of fertilised eggs caught by angler (Andrew Cressey). 2021 Stallingborough Sea Wall 2 caught on rod and line (TA225144) (Terry Marshall). 11 February 2022 Immingham (TA205162) (Lee Taylor).
Tidal Ouse
(Blacktoft Sands RSPB Reserve)
29 July 2019 (SE843233) specimen with carapace 5cm across (Darren Johnson).
(Selby Canal)
11 October 2021 In the canal at Burn (SE5828) one caught, "the first encountered in 38 years fishing" (Matt Smith).

(Naburn Lock)
• 30 April 2010 Naburn Lock (SE5945) (Julian Marshall). • 7 December 2011 Naburn Lock (SE5945) Specimen caught in an Eel/Lamprey trap but escaped back into the river. "many had been caught earlier in the season" (Graham Ford, Eel nets-man).
• 7 December 2011 and September 2013 Naburn (SE596439) (Julian Marshall).
• September 2017 Acaster Malbis (SE5845) (David Maddison).
• 20 August 2019 Below weir at Naburn Lock (SE593445) one caught on rod and line. Carapace 8cm across. (Jim Barrett).
• 9 August 2020 Naburn Lock (SE594444) (David Hammill).
• 18 July 2021 York Marina (SE597461) Dead crab on bank (Jason Barker).
(Bishopthorpe)
• 19 September 2021 (SE598465) one caught during fishing match (David Oliver).
(Central York)
• 15 October 2020 Osbaldwick Beck (SE621517) (A.B. Smith).
(Linton-on-Ouse)
• 23 June 2021 (SE4760) (Nathan Higgins).
River Aire
(Airmyn)
• 1 May 2008 Airmyn (SE7225) 2 specimens (Andy Nunn, Environment Agency). • 4 September 2012 Airmyn (SE7225) caught on rod and line. Others caught here by anglers (David Oldridge). • 3 November 2016 Airmyn (SE7225) caught in eel trap, Gary Lee (NBN record).
(Hirst Courtney)
• 15 to 18 September 2008 one was caught in the lower Aire at Hirst Courtney (SE6123) (Amanda Best, Environment Agency).
(Aire/Calder Navigation)
• 3 November 2016 (SE6518) caught in eel trap Gary Lee (NBN record). • 3 November 2016 Southfield Reservoir (SE6518) caught in eel trap Gary Lee (NBN record).
(New Junction Canal)
• 29 September 2020 seen in the margins of the canal at Braithwaite (SE621125) (Christopher Elson).
River Went
• Between 15 to 18 Sept. 2008 one was caught in the River Went near Sykehouse (SE6318) (Amanda Best, Environment Agency).

River Don
- In July 2008 one was caught on rod and line at Barnby Dun (SE6009) by a local angler (Tony Bryan). - On 17 September 2008 an adult male (carapace width 7cm, carapace length 6cm and legspan of 30cm) was caught on rod and line in the Don at St Mary's Bridge in the heart of Doncaster (SE569039) by Keith Montgomery (Offord, 2008; <i>Doncaster Free Press</i> 17 September 2008). This specimen was released back into the tidal Don at Jubilee Bridge, Fishlake (SE6714).
(Dutch River)
3 November 2016 (SE7021) caught in eel trap, Gary Lee (NBN record).
Hatfield Chase Drains and Canals
(Keadby Canal)
3 November 2016 Keadby Canal (SE7810) caught in eel trap Gary Lee (NBN record).
4. 7 November 2020 Keadby Canal Basin (SE833144) caught on rod and line (Jake Wyke).
(Folly Drain)
3 November 2016 (SE7809) caught in eel trap Gary Lee (NBN record).
(Hatfield Waste Drain)
3 November 2016 (SE8010) caught in eel trap, Gary Lee (NBN record)
(North Soak Drain)
3 November 2016 (SE8011) caught in eel trap, Gary Lee (NBN record).
(South Soak Drain)
3 November 2016 (SE7910) caught in eel trap, Gary Lee (NBN record).
(Chesterfield Canal)
14 August 2008 West Stockwith (SK785945) (Dean Gow).
River Torne
3 November 2016 Torne Bridge, Blaxton (SE6703) caught in eel trap, Gary Lee (NBN record).
River Idle
- Between 15 to 18 September 2008 2 crabs were caught in the Idle near Westwoodside (SK7395) (Amanda Best, Environment Agency). 1 November 2012 (SE5740) caught in eel trap, Gary Lee (NBN record). - August to September 2013 during a two-month period caught 734 specimens in eel traps (60% female, carapace size 8-10cm; 40% male, carapace size 10-12cm) in a 13-mile stretch from Misson (SK6994) to Mattersey (SK6889) Gary Lee (NBN record). 3 November 2016 caught in eel trap, Gary Lee (NBN record). 20 September 2020 Misterton Soss (SK777952) (Bo Mengel Jorgenson).

Lower Trent and tributaries	
•	2 January 2018 River Trent at Owston Ferry (SK813999) approximately 1000 caught in eel traps (Gary Lee).
•	Late September 2019 2 caught on rod and line in the lower Trent (Internet ref. 3).
•	20 September 2020 River Trent, West Stockwith (SK7895) (Dean Gow).
•	24 September 2020 5 crabs counted in Brick Pond, adjacent to river Trent at Burton upon Stather (SE863178) (Paul Jones).
•	8 October 2021 1 travelling over grassland by the Brick Pond (Paul Jones).
•	31 August 2020 4 specimens in the Trent, Gainsborough (SK813891) (Christopher White).
•	26 September 2021 Specimen on the Trent bank at Morton (SK834813) being devoured by a Mink <i>Neovison vison</i> (Paul Dixon).
•	Numerous sites in the Trent up-stream to Nottingham (SK54) (Lincoln & District Angling Association 9/9/2020).
(Bottesford Beck)	
•	24 June 2008 Three records from the Bottesford Beck (SE8705) (NBN record).
(River Eau)	
•	23 August 2020 Susworth (SE837032) 3 caught on rod and line (Jonathan Brewster).

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August	3	Botanical Section VC63: Doncaster Common. Meet at 10.00 at Sandal Beat Wood car park at the end of the Straight Mile (Sandal Beat Road, off Leger Way). DN2 6JP. SE609037. Contact: Louise Hill.
	10/11	VC62 Excursion: Castle Howard Estate. Meet at Bog Hall SE725707 at 10:30. A 2-day meeting, not a residential, so members can attend either or both days. Contact: Sarah White.
September	26	YNU Training Session for Leeds University Students, St. Chad's, 09:00am - 04:00pm
	28	YNU Executive, St. Chad's Meeting Rooms, Headingley. 10.30am.
October	5	Bryological Section VC63. Wessenden Head SE07710760. Contact Steven Heathcote.
November	2	Entomological Section AGM. St. Chad's Meeting Rooms, Headingley. 10.30-15.30.
	16	YNU AGM. Library@The Lightbox, Barnsley S70 1GW. 10:30-15.30.

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