NAA

EXCAVATION REPORT

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LAND EAST OF THE NURSERY, MEDBURN, NORTHUMBERLAND

prepared for

Bellway Homes Ltd

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LAND EAST OF THE NURSERY, MEDBURN, NORTHUMBERLAND

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EXCAVATION REPORT

Summary

This report presents the results of archaeological mitigation at Medburn, Northumberland. The works were required as a condition of planning permission (17/01149/FUL) for the construction of 62 residential dwellings and associated infrastructure at the site. The agreed scheme of works was an archaeological strip, map and record of part of the site, which was undertaken by Northern Archaeological Associates Ltd (NAA) on behalf of Bellway Homes Ltd.

The site was an irregular-shaped parcel of land centred on NZ 1360 7049 on the southern outskirts of Medburn village. The excavated area measured 107m by 65m and was positioned over remains discovered during a previous archaeological evaluation (PCA 2017a).

The archaeology recorded included the truncated remains of an oval structure with associated pits and postholes of a prehistoric date. Dispersed pits and postholes, the remnants of a field system and later plough furrows were also recorded.

Radiocarbon dating of a sample from one of the dispersed pits produced an Early Bronze-Age date. Samples from the oval structure and an associated posthole returned dates within the Middle or Late Iron Age. An oat grain, likely to be intrusive from ridge and furrow ploughing, returned a medieval date and an intrusive sun spurge seed was dated to the modern period.

A small number of artefacts was recovered, including worked flint, fired clay, medieval and post-medieval pottery, fragments of fired clay, ceramic building material, a piece of architectural stone and three pieces of hammerscale. Small fragments of animal bone, unidentifiable to species, and charred plant remains were also retrieved. The latter included ash, birch, alder/hazel, holly, stone fruit and apple (subfamily) charcoal as well as four cereal grains (two of wheat) from the Early Bronze Age pit. Contexts associated with the Iron Age oval structure contained hazel, birch and undetermined hardwood charcoal, along with small amounts of cereal grains (wheat and barley) and barley chaff.

The early prehistoric pits and the Iron Age structure, as well as the artefactual and ecofactal material they contained, represent a small but significant addition to the regional corpus of sites

for this period. Therefore, the results of the archaeological works will be prepared as a short article for Archaeology in Northumberland, after which, the archive will be deposited with the relevant museum.

1.0 INTRODUCTION

1.1 This report presents the results of archaeological mitigation works carried out on land east of The Nursery, Medburn, Northumberland (NZ 1360 7049; Fig. 1). The archaeological works were required as a condition of outline planning permission granted for residential development (17/01149/FUL) and comprised a programme of strip, map and record between 12th March and 1st June 2018. The report summarises the information arising from the works and represents the final excavation report, in line with current national guidelines (EH 2008; HE 2015; CIfA 2014a; 2014b).

1.2 This document has been prepared by Northern Archaeological Associates Ltd (NAA) for Bellway Homes Ltd. All archaeological works were carried out in accordance with a Written Scheme of Investigation (WSI) (PCA 2017b) and relevant standards, guidance and best practice published by Historic England, formerly English Heritage (EH 2008; HE 2015) and the Chartered Institute for Archaeologists (2014a; 2014b; 2014c; 2014d).

2.0 LOCATION TOPOGRAPHY AND GEOLOGY

2.1 Medburn village is located in south-east Northumberland, 23km from the North Sea coast. The village is approximately 5km west of Newcastle International Airport and 13km north-west of Newcastle city centre. The excavation site was located on the east side of Medburn to the north-east of Stamfordham Road (B6324). The land was predominantly overgrown rough grassland, with small trees and shrubs. Beyond its boundaries, to the north and east, the site was surrounded by residential housing of The Avenue and Harrison Hall, with the remainder being arable fields.

2.2 The land under investigation lay on broadly level ground around 100m AOD, rising slightly to the south and west to c. 117m AOD with minor undulations. To the north and east it slowly fell away towards the River Pont c. 1km away. The Med Burn, a small tributary of the Pont, flows c. 600m to the north of the investigation area whilst a small stream a short distance to the north of the site empties into the Med Burn.

2.3 The solid geology of the area comprises Stainmore Formation mudstone, sandstone and limestone, formed approximately 313 to 326 million years ago in the Carboniferous Period (BGS 2019). The superficial deposits comprise Devensian-Diamicton till that formed up to two million years ago in the Quaternary Period (BGS 2019). The soils in

the vicinity are loamy and clayey surface-water gley soils of the Brickfield 3 Association (SSEW 1983; Jarvis *et al*. 1984,123).

3.0 SUMMARY OF ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 An account of previously recorded archaeological information about the site and its surrounding area was presented in the WSI (PCA 2017b). A summary of this combining the results of research associated with the current programme of work is presented below. The wider contemporary evidence is considered in more detail in the Discussion in Section 9.

Prehistoric and Roman period

3.2 The investigation area lay within a landscape which is thought to have been densely occupied and extensively farmed during the Iron Age and Roman period (Petts and Gerrard 2006, 37-9). Numerous rectilinear enclosures have been identified on aerial photographs across the region (Burgess 1984, 163; Petts and Gerrard 2006, 37). Several examples of small enclosed settlements, thought to represent single household farmsteads, were excavated by George Jobey from the 1950s to 1980s. These investigations were generally conducted as rescue excavations ahead of the destruction of the sites by development and, with limited time and resources, excavation focused on ditch circuits and internal areas. More recent large-scale developer-funded excavations have revealed evidence for a wider range of settlements (Proctor 2009; Hodgson *et al*. 2013). These include sites at Delhi, Blagdon Hall (NAA 2008), Centre Point, Cramlington (NAA 2017) in Northumberland, and East Wideopen Farm (NAA 2018), in Tyne and Wear. The excavations were all located within a 15km radius of Medburn and provide an important glimpse of the complex and potentially densely occupied later prehistoric landscape.

3.3 Two potential Iron Age sites recorded in the vicinity of Medburn provide further evidence for prehistoric settlement in the area. A possible cropmark rectilinear enclosure was recorded 400m south-east of the site (HER 27765). At Birney Hill Farm, c. 1km to the south-east, a trial-trench evaluation, following on from a geophysical survey, revealed archaeological features ranging in date from the Bronze Age to the early medieval period, including prehistoric ring-ditches (Churchill and Moore 2015).

Medieval

3.4 The Medburn site lay close to four medieval settlements, the deserted village at South Dissington and the shrunken villages at Eachwick, Dalton and Ponteland. Ponteland (or *'Punteland'* c. 1203) was probably named after 'an island or land' on the river Pont (Ekwall 1960, 370). In the 13th century, Ponteland, Great Eland and Little Eland were the constituent parts of the manor of Eland, although the first two names seem to have been interchangeable (Wrathmell 1975, 374).

3.5 South Dissington was referred to as *'Dichaematum'* (Ekwall 1960, 145) in the Domesday Book and was part of the Seaton Delaval lordship granted to Tynemouth Priory c. 1085 (Wrathmell 1975, 364). During the later part of the 13th century, records show a total of nine taxpayers present (*ibid*.). A rental list of c. 1378 listed several freeholders and seven bonded tenants within the settlement (*ibid*.).

3.6 Eachwick is first recorded as *'Achewic'* in c. 1160 (Ekwall 1960, 155). Further references to Eachwick, dated to c. 1296, list 11 taxpayers (Wrathmell 1975, 370). A 'moiety,' or half, of the manor was held by Hexham Priory, including seven bondages and eight cottages. This suggested that the whole manor comprised an approximate total of 30 holdings (*ibid*.)

3.7 The village of Dalton is known to have been a within the lordship of Baliol in the 12th century, when one-third of the *vill* was granted to Hexham Priory. Records show a total of seven taxpayers in the settlement c. 1296, and Hexham Priory acquired the remainder of the village in the 14th century (*ibid*., 354).

4.0 PREVIOUS ARCHAEOLOGICAL WORK

Archaeological trial trenches, 2017

4.1 Prior to the strip, map and record groundworks, an archaeological evaluation, comprising 48 trial trenches, was carried out by Pre-Construct Archaeology (PCA) to investigate the archaeological potential of the site (PCA 2017a). A small percentage of these trenches revealed the presence of significant archaeological remains within the western part of the development area. Most of the trenches contained evidence for ridge and furrow ploughing, but two ditches that pre-dated these were also recorded. Palaeoenvironmental analysis of soil samples from the features identified charred spelt wheat, heather twigs, grass-type rhizomes and grass seeds.

5.0 AIMS AND OBJECTIVES

5.1 The aims and objectives of the archaeological strip, map and record were detailed in the WSI for the work (PCA 2017b) and were informed by a brief provided by Northumberland County Council Conservation Team (NCCCT 2017).

5.2 The main aim of the archaeological strip, map and record was to ensure that locally/regionally significant remains were not destroyed without first being adequately recorded. The main objectives were:

- to determine whether any remains dated to the Iron Age survived within the site;
- to provide a detailed record of any archaeological remains in advance of their loss through the proposed works;
- to recover and assess any associated structural, artefactual and environmental evidence;
- to undertake a programme of post-excavation analysis, to make the results of the archaeological works accessible via an illustrated report and, if appropriate, to undertake further analysis and publish the results in a local, regional or national journal;
- to deposit the results of the work with Northumberland County Council Historic Environment Record (HER), the Archaeology Data Service (ADS); and the Historic England archive; and
- to undertake a scheme of work that meets national and regional standards (EH 2008; HE 2015; CIfA 2014a; 2014b; 2014c; 2014d).

Research objectives

5.3 As stated in the WSI (PCA 2017b), the archaeological investigation had the potential to address key research objectives detailed in 'Shared Visions: The North East Regional Research Framework for the Historic Environment (NERRF)' (Petts and Gerrard 2006). This document highlights the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past so that all elements of commercial archaeological work can be related to wider regional

and national priorities for the study of archaeology and the historic environment (PCA 2017b, 6).

5.4 The analysis related to the fieldwork had the potential to contribute to the following 'Key Research Themes' for the Bronze Age and Iron Age:

- Ii. Chronology;
- Iii. Changing landscapes;
- Iiii. Settlement function
- Iiv. Social organisation and identity;
- Iv. Material culture.

6.0 METHODOLOGY

6.1 The programme of archaeological works was carried out in accordance with the methodology stipulated in the WSI (PCA 2017b) and followed national guidelines and standards (HE 2015; CIfA 2014a; 2014b).

6.2 To mitigate the impact of the development upon the archaeological remains present, an archaeological strip, map and record excavation was undertaken in an area measuring c. 107m x 65m as defined by the project brief (NCCCT 2017). After consultation with representatives from Northumberland County Council archaeological team, it was agreed no expansion of this area was necessary.

Excavation

6.3 Overburden soils were mechanically removed using a toothless ditching bucket under direct supervision by a qualified and experienced archaeologist until natural geology or archaeological deposits were revealed. Once the overburden had been removed, provision was made for ample time to enable adequate assessment, excavation and recording of all archaeological deposits or features present.

6.4 Hand excavation of archaeological features was undertaken in order to characterise them and to ensure the recovery of artefactual and environmental evidence. In

particular, hand excavation concentrated on intersections of features to help determine phasing plus the examination of a representative sample of the different types of features identified.

6.5 The following excavation strategy, detailed within the WSI (PCA 2017b), was followed:

- 50-100% excavation of pits and postholes, with the percentage dependent on their nature;
- a sample of up to 25% of linear/curvilinear features with non-uniform fills; and
- a sample of up to 10% of the overall length of linear/curvilinear features with a uniform fill.

6.6 Due to the potential significance of the oval structural gully it was excavated to c. 50%.

Recording

6.7 All archaeological remains were planned and located within the National Grid using a GPS, and the information was transferred to AutoCAD software for reproduction in this report. Levels were tied-in to Ordnance Datum.

6.8 Written descriptions of archaeological features/deposits were recorded on NAA pro forma context sheets, which employ standard archaeological recording conventions.

6.9 A drawn record of all archaeological features was made at an appropriate scale. Plans were drawn at 1:20 scale, and sections were recorded at 1:10 or 1:20 scale depending on the detail considered necessary, with their location accurately identified on the relevant plan. All drawings included appropriate data on levels relative to Ordnance Datum.

6.10 A photographic record in 35mm black and white film and digital formats was made to document the archaeological works. Photographs were taken of all archaeological deposits, features and layers in order to record their characteristics and relationships.

Finds recording

6.11 All finds processing, conservation work and storage was carried out in compliance with guidelines issued by the Chartered Institute for Archaeologists (CIfA 2014c). All finds recovered were appropriately packaged and stored under optimum conditions. Finds recovery and storage strategies were in accordance with published guidelines (EH 1995; Watkinson and Neal 2001).

Environmental sampling

6.12 Bulk palaeoenvironmental samples were taken from appropriate deposits and submitted for assessment of their environmental potential. Recovery and sampling of environmental remains was in accordance with published guidelines (Campbell *et al.* 2011; EH 2008; 2014). Material for radiocarbon dating was taken as subsamples from the recovered remains.

7.0 RESULTS

7.1 The archaeological works revealed evidence of activity during the Early Bronze Age, Middle to Late Iron Age and the medieval and post-medieval periods. The recorded features (Fig. 2) comprised isolated and groups of pits and postholes, an oval structure (Fig. 3), the remnants of an early field system and evidence of ridge and furrow ploughing (Fig. 2).

7.2 Due to the lack of datable material recovered, the features could only be placed within four broad chronological phases. These comprised possible early prehistoric pits, the oval Iron Age structure, the early field system and medieval or later plough furrows. The following text describes the excavated results in chronological order.

Phase 1: early prehistoric

7.3 This earliest activity comprised two truncated pits (07 and 09), recorded in the south-west corner of the excavation, one of which was radiocarbon dated to the Early Bronze Age (see para 7.5).

7.4 Each feature consisted of shallow concave cuts with slightly heat-affected sides (Fig. 4, sections 1 and 2; Plate 1). Both features had similar fills (06 and 08) comprising reddish-yellow burnt small subangular stones set within dark greyish silt clay. No artefacts were

recovered from the pits, however both produced charcoal (including ash (*fraxinus*), birch (*betula*), alder/hazel (*alnus/corylus*), holly (*ilex*), stone-fruit (*prunus*) and apple sub-family (*maloideae*)), and pit 07 produced charred grain (including two wheat – *triticum* sp.).

Plate 1: Pit 09

7.5 A fragment of *prunus* charcoal from pit 09 returned a radiocarbon date of c. 1874-1664 cal BC (at a probability of 95%) (SUERC-84957).

7.6 Given the similarity of the two pits, it is considered possible that they were broadly contemporary. Additionally, some of the undated pits (see below) may be early prehistoric in date.

Phase 2: Iron Age

7.7 The second phase of discernible activity comprised an oval structure (65), three associated postholes (53, 99 and 103) and two potentially contemporary pits (76 and 98). Radiocarbon dating (see Appendix G) suggested activity associated with this structure in the Middle or Late Iron Age (see para. 7.11).

7.8 The oval structure (Plate 2) may have been a domestic dwelling, or a structure of otherwise unknown function. Very little domestic waste was recovered from the associated features and no definitive remains of a hearth were identified. However,

given the high levels of truncation in this area, this absence may be largely due to post-depositional factors.

Plate 2: Oval structure 65

7.9 The structure was located approximately central to the excavation on the west side, cut into a relatively level natural platform. It was heavily truncated by medieval or later ridge and furrow ploughing (Phase 4), creating an intermittent circuit comprising 11 separate portions that enclosed an area of 32.5m^2. The gully (65) varied in width between 0.10m and 0.32m and was between 0.24m and 0.44m deep. A south-east facing entrance, in the form of two deliberately cut opposing termini, was identified.

7.10 Gully 65 had a rounded, V-shaped profile, (Fig 4, sections 33, 38 and 39; Plate 3) and its fills (64, 81, 87, 88, 89, 92, 93, 94, 96 and 108) consisted of mid-greyish red-brown silty clays. A notable amount of small subangular sandstone fragments occurred within most of the deposits. The sandstone fragments were probably not packing stones to support posts, as they were neither numerous enough nor intentionally placed. No pottery or other datable artefacts were recovered, however two fragments from medium-sized mammal long-bones, carbonised grain and charcoal were retrieved. The charcoal was not identifiable to species, but two wheat, one barley (*hordeum*) and one oat (*avena*) grains, as well as a fragment of barley chaff and a few charred seeds, were recovered.

Plate 3: Section 38 through gully 65

7.11 The carbonised oat and wheat grains recovered from gully 65 were submitted for radiocarbon dating. The former (SUERC-84361) produced a medieval date (see Appendix G), however the wheat grain (SUERC-84362) returned a date of 168-41 cal BC (95% probability).

7.12 Three subcircular postholes (99, 103 and 53) were positioned approximately central to the ring-gully. These features had steep sides, flat or rounded bases and measured between 0.4m to 0.5m wide by up to 0.3m deep. Features 99 and 103 each contained a single fill (100 and 104 respectively). Posthole 53 contained a 'postpipe' fill (54) formed after the removal of a post (Fig. 4, section 21). Fill 54 produced a hard-hammer flint flake that showed traces of thermal damage, charcoal (hazel and birch), a barley grain, barley chaff and charred seeds.

7.13 Posthole 99 contained a charred sun spurge seed (*Euphorbia helioscopia*) and feature 103 produced an oat grain. A radiocarbon date range of 180-46 calBC (95% probability) was measured from a barley grain from posthole 53 (SUERC-84360) suggesting the backfilling of this feature was during the Middle or Late Iron Age. The closeness of this date with that from the oval gully suggests the likelihood of a strong correlation between

these two features. A realistic case can therefore be put forward suggesting that the three postholes (99, 103 and 53) formed part of the same structure/dwelling.

7.14 Two shallow pits recorded close to the structure may also have been contemporary with the structure; however, no dating evidence was recovered. The first (76) was located c. 0.60m south of gully 65 and comprised a circular cut containing a single deposit (77) of yellow-brown clay. The second pit (98) was situated a further 3.40m south-west. It was slightly larger in diameter, measuring 0.76m by up to 0.09m deep. Like pit 76, it contained a single fill (97). As with most of the features excavated, no finds were recovered.

Phase 3: early field system

7.15 Phase 3 consisted of the truncated remnants of a field system that pre-dated the Phase 4 furrows. It was formed by the remnants of four ditches, two following an east to west alignment (12 and 52), one running north to south (50) and one (28) north-west to south-east. Ditch (12) was the best preserved and extended across the investigation area (Fig. 2). It had a V-shaped profile and measured between 0.7m by up to 0.5m deep and 0.35m by up to 0.1m deep (Fig 4, sections 26 and 28; Plate 4).

Plate 4: Section 26 through ditch 12

7.16 To the north (Fig. 3), ditch 52 only survived as a 5.5m long remnant that was c. 0.5m wide by up to 0.15m deep (Fig. 4, section 20).

Plate 5: Section 34 through ditch 50

7.17 Ditch 50 ran approximately north to south c. 3.5m to the west of the oval gully (Fig. 3). It was 16.5m long and measured c. 0.6m wide by up to 0.3m deep (Fig. 4, section 34). Five fragments of fired clay and a small amount of charcoal (including birch, apple sub-family, hazel and oak), charred seeds and a single fragment of wheat chaff were recovered from its fills.

7.18 To the north-east of the oval gully, ditch 28 survived as two truncated sections in the base of a furrow. It followed the alignment of the furrows so may not have been contemporary with the other elements of the field system, although it was cut by (earlier than) the Phase 4 furrows. In total, the two segments ran for c. 15m and measured up to 0.5m wide by 0.05m deep. No artefactual or ecofactual evidence was recovered from this ditch.

Phase 4: medieval or later

7.19 The last identifiable phase of activity recorded in the excavation, and still partly visible today, was ridge and furrow ploughing. The furrows were very similar in section, with the centre of each ridge varying between 5-7m apart. The furrows truncated all of the other archaeological features and followed a north-west to south-east alignment.

Undated isolated features

7.20 A total of 21 isolated and dispersed features were recorded across the excavated area, including the pits (07, 09, 76 and 98) assigned to Phases 1 and 2. The majority of these were pits, postholes or natural features, such as tree throws. During post-excavation assessment of the archaeological results, most of these features were found to require no further analysis.

7.21 Situated in the north-east corner of the excavation area (Fig. 2), three small intercutting postholes (37, 44 and 46) were recorded. These features were very distinctive in their composition, being the only postholes to contain *in situ* packing stones. The fill of feature 37 produced a small amount of oak (*quercus*) charcoal and a single fragment of hammerscale, whilst a tiny amount of charred seeds was retrieved from posthole 46.

7.22 A single large pit (59), measuring 1.20m by 0.60m by up to 0.30m deep was located 17m south-east of ring-gully 65. This feature contained a single fill of firm mid-greyish clay with subangular stones.

8.0 FINDS, ENVIRONMENTAL EVIDENCE AND RADIOCARBON DATING

8.1 The following section provides condensed summaries of the specialist reports, more detailed versions are presented as Appendices B-H.

Flint (Freddie Foulds)

8.2 The five worked artefacts recovered comprise a small assemblage with Mesolithic and Neolithic affinities (see Appendix B).

8.3 The artefacts consisted of three flakes, a fragment of a broad blade and a narrow bladelet. Both blades displayed significant, fine edge damage restricted to parts of a single lateral edge, which may possibly have been caused by use, probably as simple

knives. The flakes were undiagnostic of any particular period, with two being soft hammer and one being hard hammer in origin. A single, thin flake with a curved, twisting profile may have resulted from thinning. The larger, thicker hard hammer flake, which was found in the fill of posthole (53), had some thermal damage and thus may have possibly been burnt. It also had a large potlid scar on the dorsal, which may also have resulted from burning. The remaining flints were all found in the topsoil.

8.4 All of the artefacts were produced from flint. This was predominantly brown to yellow brown in colour, with only two pieces being grey. Residual cortex was absent in all bar one case and even here the amount remaining was limited. This suggests that the assemblage was restricted to later stage reduction, although its small size precludes any firm conclusions about core working in the vicinity. Patina was generally absent and was only present in one case; this presented as calcination of the outer surface and was accompanied by crazing and minor thermal damage, suggesting this piece had been heated or partially burnt.

8.5 The type of raw material recovered is consistent with that found within the surficial deposits within the area, which consist of Devensian till. Flint of these types and colours has been recorded in the region by Young (1987). It is therefore likely that much, if not all the material is local in origin.

Medieval pottery (Charlotte Britton)

8.6 A total of 18 sherds (289.1g) of medieval and post-medieval pottery was recovered from the topsoil (01). The assemblage (Appendix C) provides little information about the features excavated on site beyond indicating domestic activity in the area during the medieval and post-medieval periods.

8.7 The assemblage comprised 12th- to 14th- and 18th- to 19th-century material and was classified exclusively as domestic ware. A maximum of 12 vessels was represented and all the pottery was in good condition. It was British in origin and was most likely produced within the local region. Both the wares and forms identified were highly characteristic of their respective periods.

8.8 The medieval wares (10 sherds) made up 56% of the assemblage and included buff sandy ware, gritty wares, oxidised sandy gritty ware, reduced sandy ware and sandy ware. Three sherds of different fabrics displayed evidence of green glaze on the external

surfaces. Lead glazes were highly characteristic of the medieval period and typical of the region. As the sherds were fragmentary, specific forms were difficult to identify; however, they most likely took the form of hollow wares.

8.9 The post-medieval wares included slipware, stoneware and whiteware. The forms identified were, again, typical of the period comprising flatwares and various hollow wares. One complete vessel, a small brown salt-glazed bottle with a 30mm rim and 80mm depth, was most likely used to contain ink.

Fired clay and stone (Chrystal Antink)

8.10 The assemblage consisted of 12 fragments (292g) of fired clay from topsoil (01) and a fill (51) of ditch 50 (Appendix D). The topsoil (01) also produced a fragment of tile, and a possible architectural stone fragment was recovered from the fill (31) of a furrow.

Animal bone (Hannah Russ)

8.11 In total, five fragments of animal bone were recovered (Appendix E). These remains could represent either wild or domestic animals.

8.12 Three fragments of bone representing the remains of a large mammal(s) were recovered from the topsoil (01). Two of the fragments refitted and formed a section of rib. The third fragment could not be identified to any specific element other than 'long bone'. The category 'large mammal' in this context would include taxa such as cattle (*Bos*), horse (and other equids - *Equus*), and red deer (*Cervus elaphus*). As these remains were recovered from topsoil, no further discussion is presented.

8.13 Species-level identification was not possible for the two fragments of bone recovered from context 89 (fill of ring-gully 65). The bones from this context represented the remains of a smaller animal(s) than those recovered from context 01, with cortical bone thickness, size and shape suggesting a medium-sized mammal(s). The category 'medium mammal' in this context would include (but not limited to) animals such as sheep/goat (*Ovis Capra*), roe deer (*Capreolus capreolus*), and wolf or dog (*Canis* sp.).

8.14 The material from context 01 was in very poor condition, with all three fragments displaying surface pitting, surface weathering and modern breaks. The two fragments from context 89 were in slightly better condition, though still poor. No evidence for

carcass processing (cut or chop marks), burning or animal interaction in the form of gnawing was observed. None of the material could provide any information regarding age at death or sex.

Palaeobotanical remains (Jonathan Baines)

8.15 Eighteen bulk environmental samples were examined for charred plant remains (Appendix F). Fragments of native hardwood charcoal (Table 1) were identified as well as a small assemblage of cereals and seeds.

8.16 The bulk environmental samples were processed with 0.5mm retention meshes using the Siraf method of flotation (Williams 1973). All sampling and analyses were carried out in line with Historic England (Campbell *et al.* 2011) guidelines and standards. The plant remains and charcoal were identified to species as far as possible using Schweingruber (1990), Hather (2000), Cappers *et al.* (2006), Jacomet (2006) and the NAA reference collections.

Table 1: Charcoal

Context	Sample	Weigh (g)t	ID	Amount %	Common
6	aa	73	*prunus*	60	stone fruit
6	aa		*maloideae*	40	apple subfamily
8	aa	27.4	*maloideae*	45	apple subfamily
8	aa		*fraxinus*	25	ash
8	aa		*betula*	30	birch
8	ab	137.3	*maloideae*	45	apple subfamily
8	ab		*alnus / corylus*	20	alder / hazel
8	ab		*fraxinus*	15	ash
8	ab		*prunus*	15	stone fruit
8	ab		*ilex*	5	holly
39	aa	1.9	*quercus*	100	oak
54	aa	2.4	*corylus*	50	hazel
54	aa		*betula*	50	birch
56	aa	8.3	*betula*	50	birch
56	aa		*corylus*	25	hazel
56	aa		*quercus*	25	oak
82	aa	1.3	*betula*	40	birch
82	aa		*maloideae*	20	apple subfamily
82	aa		*corylus*	20	hazel
82	aa		*quercus*	20	oak
87	aa	1.2	undet. Hardwood		
92	aa	0.1	undet. Hardwood		

Table 2: Charred seeds and fruit

Context	Sample	ID	Amount	Description
8	aa	undet. Cereal	2	pit
8	aa	*Triticum sp.*	1	pit
8	ab	*Triticum sp.*	1	pit
39	aa	*Carex (trigonous)*	1	pit
39	aa	*Poaceae* 2 - 5 mm	2	pit
47	aa	*Galium sp.*	1	pit
47	aa	undetermined 2-5 mm	2	pit
54	aa	*Hordeum*	2	posthole
54	aa	*Poaceae* 2 - 5 mm	1	posthole
54	aa	barley chaff	1	posthole
54	aa	*Poaceae* < 2 mm	1	posthole
54	aa	*Carex (trigonous)*	2	posthole
54	aa	*Lamiaceae*	1	posthole
56	aa	*Poaceae* 2 - 5 mm	1	posthole
56	aa	*Poaceae* < 2 mm	1	posthole
56	aa	*Brassica sp.*	1	posthole
75	aa	*Triticum sp.*	1	ditch/gully
82	aa	*Poaceae* < 2 mm	2	ditch/gully
82	aa	spelt chaff	1	ditch/gully
82	aa	*Carex (trigonous)*	1	ditch/gully
88	aa	*Triticum sp.*	1	ring gully
88	aa	*Poaceae* 2 - 5 mm	2	ring gully
88	aa	barley chaff	1	ring gully
89	aa	*Avena*	1	ring gully
89	aa	*Poaceae* 2 - 5 mm	2	ring gully
92	aa	*Hordeum*	1	ring gully
92	aa	*Poaceae* < 2 mm	3	ring gully
92	aa	*Poaceae* 2 - 5 mm	1	ring gully
92	aa	*Triticum sp.*	1	ring gully
100	aa	*Euphorbia helioscopia*	1	pit
100	aa	*Poaceae* 2 - 5 mm	2	pit
104	aa	*Avena*	1	posthole/pit

8.17 The barley may be more closely identified as hulled, or free-threshing (*Hordeum vulgare*), due to the recovery of a spikelet fork from the fill (88) of gully 65 and residues of glumes adhering to some of the kernels. Though the spelt spikelet fork (*Triticum spelta*) identified in the fill (82) of ditch 50 suggests this species was consumed.

Differentiation by grain morphology alone is not sufficient for a secure species, specific recording of the five grains from the other contexts.

8.18 Similarly, due the absence of accompanying chaff remains, it was not possible to differentiate between domesticated or wild oats (*Avena sativa* and *fatua* respectively).

8.19 Sun spurge (*Euphorbia helioscopia*) is a ruderal *archaeophyte* from the Mediterranean basin and very rare in Britain before the Middle Ages. It is therefore unsurprising that radiocarbon dating identified it as from the nuclear era (post-1950).

8.20 The sedges (*Carex sp.),* mustard (*Brassica sp*.), mint family (*Lamiaceae*) and undetermined small grasses are a common component of meadows and swards. Though they could indicate burnt remains of animal fodder, bedding or refuse clearance, they may have inadvertently charred during unrelated on-site activities.

8.21 Holly (*Ilex aquifolium*) is not a common component of prehistoric charcoal assemblages. The few fragments from context 08 are thus possibly the remains of an artefact.

8.22 The high proportion of *pomaceous* wood (*Maloideae* (hawthorn, rowan, medlar, whitebeam, pear or apple) and stone fruit (*Prunus* sp.) suggests opportunistic exploitation of the surrounding tree cover as fuel for domestic fires as these trees do not produce thick or great firewood.

8.23 Identification of hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and birch (*Betula sp*.) suggests the presence of moist woodlands in the area. No clear signs of coppicing were recognised in these fragments. Though these trees were often used in construction, wattling or for the production of tools and other artefacts, no clear signs for such usage were recognised. The overall dominance of oak in the charcoal assemblage reflects its ubiquity in British woodlands and its status as a good fuel.

Radiocarbon dating (Gav Robinson)

8.24 With regard to the Medburn project, the significance of the early and later prehistoric remains, and the paucity of datable artefacts, there was a clear need for independent dating (see Appendix G). Furthermore, there was a need to date the regionally significant unenclosed oval structure. However, due to unfavourable ground conditions, there was a lack of suitable material. The majority of the sampled contexts only

produced small amounts of charcoal and the features were highly truncated. A total of five samples (excluding the initial failure from context 08) were submitted to the Scottish Universities Environmental Research Centre AMS Facility (SUERC) for radiocarbon dating (Table G1).

8.25 During the analysis associated with this project, Bayesian modelling (Naylor and Smith 1988; Bayliss 2009; Whittle *et al*. 2011, 19-59; Bayliss 2015) of some of the radiocarbon dates was undertaken using OxCal v4.3.2 (Bronk Ramsey 2017).

8.26 All calibrated radiocarbon dates reproduced in the text, unless stated otherwise, represent calibrated calendar years (cal AD or cal BC) at a probability of 95.4%. Modelled 'posterior density estimates' (Whittle *et al*. 2011, 21) are presented in italics.

Table 3: Radiocarbon dating results

Context	Interpretative description	Lab Code	Material	δ 13C relative to VPDB (‰)	Radiocarbon result BP	Calibrated date range (at 95.40%) (cal. BC)
08	Fill of pit 09	n/a	Wheat grain	n/a	FAIL	
08	Fill of pit 09	SUERC-84957	Prunus charcoal	-25.4	3434±24	1874 (9.6%) 1843 calBC 1816 (2.8%) 1799 calBC 1779 (83.0%) 1664 calBC
54	Fill of posthole 53	SUERC-84360	Barley grain	-24.4	2091±24	180-46 calBC
89	Fill of ring gully 65	SUERC-84361	Oat grain	-24.1	716±24	calAD 1259-1299 calAD 1373-1377
92	Fill of ring gully 65	SUERC-84362	Wheat grain	-25.0	2072±21	168-41 calBC
100	Fill of pit 99	SUERC-84363	Sun Spurge seed	-26.3	1.2144±0.0029	Post 1950 AD

8.27 The pool of material available from the Medburn contexts comprised small amounts of charred material with few accumulations (such as discrete dumped lenses). This issue increased the chance that any material chosen for dating was intrusive from later activity or residual from earlier. For instance, charred material may have been 'stored', either in a former soil or an above ground pile (or midden) for some considerable time before entering a context selected for dating.

8.28 Based on the available material and the significance of the oval structure, samples were chosen from context 08 (pit 09), the ring-gully, posthole 53 and pit 99. Charred grain and the sun spurge seed were chosen as these materials are short-lived. However, due to the small amounts of grain in these contexts, the chance that some were intrusive or

residual from earlier activity was noted as moderately high. Hence, low quality orders have been attached to the radiocarbon dating results and their measured ages only broadly date the activity associated with the contexts.

8.29 The *prunus* charcoal (SUERC-84957) from pit 09 sent as a replacement for the failed wheat grain returned a date range of c. 1874-1664 calBC (at a probability of 95.4%). This date is considered to be a moderately accurate measurement of the date of pit 09, placing its infilling to the Early Bronze Age. However, it should be remembered that this single measurement represents a small sample of the charcoal within the pit.

8.30 The oval ring-gully and associated postholes and pits represented an unusual structure of potentially later prehistoric date. To mitigate the poor suitability of the available material, four samples, chosen from a variety of associated contexts that produced greater amounts of charcoal, across the area of the group, were submitted. Two samples were chosen from the ring-gully, one from posthole 53 and one from pit 99. These dates were also designed to test the antiquity of the sun spurge as well as the wheat, oat and barley.

8.31 The dates measured from the sun spurge seed and oat grain suggested that these were both intrusive from later activity. The remaining two dates measured from wheat and barley grains returned Iron Age dates and were considered (on the weight of evidence) to be representative of activity associated with the structure. These two radiocarbon measurements (SUERC-84360 and SUERC-84362) were subject to Bayesian modelling using the '**Phase**' function.

8.32 This model had good overall agreement (Amodel=102.5 and Aoverall=102.5) and produced a statistical '**Span**' of activity of between *0* and *935* years (*95.4% probability*) or between *0* and *250* years (*68.2% probability*). This suggests that the charred grains could have 'died' in the same year. This was confirmed using the '**R-Combine**' function.

8.33 The posterior density estimates for the start of this activity was *820-50 cal BC* (*95.4% probability*) or *230-60 cal BC* (*68.2% probability*), or likely within the Middle to Late Iron Age. The modelled estimate for the end of activity was potentially within the Middle to Late Iron Age, at *165 calBC-calAD 515* (*95.4% probability*), or *145cal BC-calAD 25* (*68.2% probability*).

8.34 This model indicates that the activity that produced the charcoal was probably undertaken during the Middle to Late Iron Age. The small number of dates, as well as the moderate chance of residuality and intrusion from later materials, along with the apparent degree of post-depositional disturbance, means that this modelling should be considered as tentative.

9.0 DISCUSSION

The early prehistoric pits

9.1 The Early Bronze Age dates from *prunus* charcoal recovered from the fill of pit 09 suggested it was of an early prehistoric date. It is possible that feature 07 and some or all of the other undated pits and postholes (21, 37, 44, 46 and 102) were of a similar date. These features may be referred to as pit clusters, which are known to occur on prehistoric sites throughout the region (Petts and Gerrard 2006, 24). Numerous examples of these have been investigated in and around the Milfield Basin, including features at Coupland (Waddington 1999, 134-6).

Iron Age activity

9.2 Within the coastal plain of south-east Northumberland, as well as the wider Northern region, the rectilinear enclosure has been widely recognised as the predominant form of Iron Age settlement (Petts and Gerrard 2006, 37-9; Haselgrove *et al*. 2001). In the vicinity of Medburn, examples have been recorded at Pegswood (Proctor 2002), Delhi, Blagdon Hall (NAA 2008), Centre Point, Cramlington (NAA 2017) and East Wideopen Farm (NAA 2018).

9.3 Less commonly recorded are unenclosed settlements that often comprise one or more roundhouses without any formal enclosure ditch (Petts and Gerrard 2006, 36-7). The dating of the unenclosed structure at Medburn to the Middle or Late Iron-Age is therefore an important addition to the regional corpus. This settlement may not be typical for the region but sits firmly within the diverse settlement pattern. Examples of unenclosed settlement phases were also recorded at Delhi (NAA 2008), Centre Point, Cramlington (NAA 2017) and East Wideopen Farm (NAA 2018). This type of settlement is becoming more widely recognisable due to large-scale developer-funded archaeological excavations.

9.4 The site at Medburn was heavily truncated by medieval and post-medieval ploughing. This removed any evidence of shallow features associated with the oval structure, such as surfaces, shallow post-settings and hearths. Additionally, the notable absence of artefactual remains hampered the dating of the features. This was further compounded by the lack of large quantities of suitable carbonised material for radiocarbon dating. Even so, the dates obtained from the oval gully and posthole 53 placed the disuse of this settlement to the Middle or Late Iron Age.

Subsistence and economy

9.5 With the minimal amount of environmental material recovered, it is difficult to reconstruct the subsistence strategies of the inhabitants of the Medburn site. The carbonised wheat and barley grains from the Iron Age features are, however, typical for crops identified on similarly dated sites in the region (Petts and Gerrard 2006, 35). Additionally, the radiocarbon dating has demonstrated that oats were grown during the medieval period and has inferred the use of wheat in the Early Bronze Age.

The early field system

9.6 Due to a lack of dating evidence, it is unknown whether the oval structure and the Phase 3 field system were contemporary. The field system exposed was mostly on a different alignment to and was cut by the Phase 4 furrows. It was also not aligned with the post-medieval and modern boundaries and therefore an early medieval or earlier date is likely. Ditch 50 did, however, seem to respect the limit of the eastern edge of the Iron Age structure. This evidence alone was not enough to confirm that the field system and the structure were contemporary.

10.0 CONCLUSIONS

10.1 The archaeological works undertaken on land east of The Nursery, Medburn, Northumberland have identified significant, if limited, activity during the Bronze Age and the Iron Age. Therefore, the results of the archaeological works will be prepared as a short article for Archaeology in Northumberland.

10.2 Due to the limited area of the investigation, the solitary structure may have been part of a larger settlement, as yet unrevealed. With this in mind, future development may encounter further features in the form of dwellings and traces of agricultural activity.

10.3 Additionally, the fragmentary traces of a possible early field system that potentially pre-dated the 12th to 14th centuries were recorded. It is possible that the field system was contemporary with the oval structure, however, this could not be established due to a lack of datable evidence.

REFERENCES

Bayliss, A. (2009) Rolling Out Revolution: Using Radiocarbon Dating in Archaeology. *Radiocarbon* **51(1)**, 123-47.

Bayliss, A. (2015) Quality in Bayesian chronological models in archaeology. *World Archaeology* **47:4**, 677-700.

British Geological Survey (2019) *Geology of Britain Viewer*. [Online]. Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html (accessed 21 on 21/07/2017).

Bronk Ramsey, C. (2017) *OxCal version 4.3.2; r5* [Online]. Available at: https://c14.arch.ox.ac.uk/oxcal/OxCal.html (Accessed on 24.4.19).

Burgess, C. (1984) 'The prehistoric settlement of Northumberland: a speculative survey.' In R. Miket and C. Burgess (eds) *Between and beyond the walls: essays in honour of George Jobey*. Edinburgh: John Donald, 126-175.

Campbell, G., Moffett, L. and Straker, V. (2011) *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-Excavation (second edition)*. Portsmouth: English Heritage.

Cappers, R. T. J., Bekker, R. M. and Jans, J. E. A. (2006) *Digitale Zadenatlas Van Nederland: Digital Seed Atlas of the Netherlands*. Groningen: Barkhuis Publishing.

Chartered Institute for Archaeologists (2014a) *Standard and guidance for an Archaeological watching brief*. Reading: Charted Institute for Archaeologists.

Chartered Institute for Archaeologists (2014b) *Standard and guidance for an archaeological excavation*. Reading: Charted Institute for Archaeologists.

Chartered Institute for Archaeologists (2014c) *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Reading: Charted Institute for Archaeologists.

Chartered Institute for Archaeologists (2014d) *Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives*. Reading: Charted Institute for Archaeologists.

Churchill, D. and Moore, B. (2015) *Land at Birney Hill, Ponteland, Northumberland. Archaeological evaluation report*. Wardell Armstrong Archaeology. Unpublished client report.

Ekwall, E. (1960) *The Concise Oxford Dictionary of English Place-names, Fourth Edition*. Oxford: Clarendon Press.

English Heritage (1995) *A Strategy for the Care and Investigation of Finds*. London: English Heritage.

English Heritage (2008) *MoRPHE Project Planning Note 3 Archaeological Excavations*. London: English Heritage.

English Heritage (2014) *Animal Bones and Archaeology: Guidelines for best practice*. Swindon: English Heritage.

Haselgrove, C., Armit, I., Champion, T., Creighton, J., Gwilt, A., Hill, J. D., Hunter, F. and Woodward, A. (2001) *Understanding The British Iron Age: An Agenda For Action*. The Trust for Wessex Archaeology.

Hather, J. G. (2000) *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators*. London: Archetype.

Historic England (2015) *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' guide*. Swindon: English Heritage.

Hodgson, N., McKelvey, J. and Muncaster, W. (2013) *The Iron Age on the Northumberland Coastal Plain*. Tyne and Wear Archives & Museums Archaeology Monograph No 3. Newcastle-upon Tyne: TWM Archaeology and the Arebeia Society.

Jacomet, S. (2006) *Identification of Cereal Remains from Archaeological Sites. 2nd Edition*. Archaeobotany Lab. Basel: IPAS, Basel University.

Jarvis, R. A., Bendelow, V. C., Bradley, R. I., Carroll, D. M., Furness, R. R., Kilgour, I. N. L. and King, S. J. (1984) *Soils and their Use in Northern England*. Harpenden: Soil Survey of England and Wales Bulletin No. 10.

Naylor, J. C., and Smith, A. F. M. (1988) An Archaeological Inference Problem. *Journal of American Statistical Association* **83**, 588-95.

Northern Archaeological Associates (NAA) (2008) *Delhi, Blagdon Hall, Northumberland: Post-Excavation Assessment Report*. NAA unpublished report **08/28**.

Northern Archaeological Associates (NAA) (2017) *Centre Point, Cramlington, Northumberland: Specialist Background Information*. NAA unpublished report **17/96**.

Northern Archaeological Associates (NAA) (2018) *East Wideopen Farm, Wideopen, North Tyneside: Post-Excavation Assessment Report*. NAA unpublished report **17/143**.

Northumberland City Council Conservation Team (NCCCT) (2017) *Land at East of The Nursery, Medburn, Northumberland: Brief for a programme of Archaeological Strip, Map and Record mitigation*. Northumberland: Northumberland County Council.

Petts, D. and Gerrard, C. (2006) *Shared Visions: The North-East Regional Research Framework for the Historic Environment*. Durham: Durham County Council.

Pre-Construct Archaeology (2017a) *Land East of The Nursery, Medburn Village, Northumberland: Archaeological Evaluation Report*. PCA Unpublished report.

Pre-Construct Archaeology (2017b) *Written Scheme of Investigation for Archaeological Strip, Map and Record in Association with a Housing Development on Land East of The Nursery, Medburn, Northumberland*. PCA Unpublished report.

Proctor, J. (2009) *Pegswood Moor, Morpeth: a later Iron age and Romano-British farmstead settlement*. Pre-Construct Archaeology Monograph 11. London: Pre-Construct Archaeology Limited.

Schweingruber, F. H. (1990) *Microscopic Wood Anatomy. 3rd Edition*. Swiss Federal Institute for Forest, Snow and Landscape Research.

Soil Survey of England and Wales (SSEW) (1983) *Soils of England and Wales Sheet 1: Northern England*.

Waddington, C. (1999) *A landscape archaeological study of the Mesolithic-Neolithic in the Milfield Basin*. BAR British Series 291. Oxford: British Archaeological Reports.

Watkinson, D. and Neal, V. (2001) *First Aid for Finds (3rd Edition - re-issued)*. RESCUE and the Archaeological Section of the United Kingdom Institute for Conservation

Whittle, A., Healy, F. and Bayliss, A. (2011) *Gathering Time: Dating the Early Neolithic Enclosures of Southern Britain and Ireland*. Oxford and Oakville: Oxbow Books.

Williams, D. (1973) Flotation at Siraf. *Antiquity* **47**, 198-202.

Wrathmell, S. (1975) *Deserted and Shrunken Villages in Southern Northumberland from the Twelfth to the Twentieth Centuries*. Unpublished PhD Thesis Cardiff.

Young, R. (1987) *Lithics and Subsistence in North-Eastern England: aspects of the prehistoric archaeology of the Wear Valley, Co. Durham, from the Mesolithic to the Bronze Age*. BAR British Series 161. Oxford: British Archaeological Reports.

APPENDIX A

CONTEXT CATALOGUE

Context	Interpretative description	Details	Period	Finds and sample information
1	Topsoil		Modern	10 medieval (12th-14th) pottery sherds (55.1g), 8 post medieval (18th-19th) pottery sherds (192g), 3 fragments of fired clay (89g), 2 tile fragments (31g), 2 fragments of large mammal rib bone (7g), 1 fragment of large mammal long-bone(6g) and 4 worked flint (2 undiagnostic flakes, a Meso/ENeo broad blade (with use wear) and a Meso/ENeo narrow bladelet (with use wear)).
2	Subsoil		Modern	
3	Natural gravels and clays			
4	Fill of furrows		Medieval or later	
5	Furrows		Medieval or later	
6	Fill of pit 7	Mid brown greyish fill	Prehistoric?	AA, Bulk sample 30 litres. 73g of charcoal (including *prunus* and *maloideae*)
7	Shallow oval pit	Filled by 6	Prehistoric?	
8	Fill of pit 9	Mid brown greyish fill	Early Bronze Age	AA, Bulk sample 20 litres, AB, Bulk sample 20 litres. 164g of charcoal (including *fraxinus*, *betula*, *alnus/corylus*, *ilex*, *prunus* and *maloideae*). 4 cereal grains (2 *triticum*, 2 undet.). *Prunus* charcoal radiocarbon dated to c. 1874-1664 calBC (95%) (SUERC-84957).
9	Shallow oval pit	Filled by 8	Early Bronze Age	
10	Fill of pit 11		Unknown	
11	Shallow oval pit	Filled by 10	Unknown	
12	Ditch	Filled by 17	Pre-medieval	
12	Ditch	Filled by 36	Pre-medieval	
12	Ditch	Filled by 48	Pre-medieval	
12	Ditch	Filled by 63,67	Pre-medieval	
12	Ditch	Filled by 70,71	Pre-medieval	
12	Ditch	Filled by 75,80	Pre-medieval	
12	Ditch	Filled by 83,84	Pre-medieval	
13	Field drain		Modern	
14	Shallow oval pit	Filled by 15 and 16	Unknown	
15	Burnt deposit within pit 14		Unknown	AA, Bulk sample and C14 sample 10 litres
16	Primary deposit within pit 14		Unknown	AA, Bulk sample 10 litres
17	Fill of ditch 12		Pre-medieval	AA, Bulk sample 20 litres
18	Field drain		Modern	
19	Irregular shallow pit	Filled by 22	Unknown	
20	Oval shaped pit	Filled by 23	Unknown	
21	Irregular pit	Filled by 26	Unknown	
22	Fill of pit 19		Unknown	AA, Bulk sample 10 litres

Context	Interpretative description	Details	Period	Finds and sample information
23	Fill of pit 20	Orange silty clay and charcoal fill	Unknown	AA, Bulk sample 30 litres
24	Very shallow oval pit	Filled by 25	Unknown	
25	Fill of pit 24	Single dark brown fill	Unknown	AA, Bulk sample 10 litres
26	Fill of pit 21	Upper fill of cut 21	Unknown	AA, Bulk sample 40 litres
27	Plough furrow	Filled by 30, 31	Medieval	
28	Shallow U shaped gully	Filled by 29	Pre-medieval	
29	Fill of gully 28	Mid brown greyish fill	Pre-medieval	
30	Fill of furrow 27	Upper fill of furrow	Medieval or later	
31	Fill of furrow 27	Lower fill of furrow	Medieval or later	A fragment of possible architectural stone (sandstone)
32	Shallow circular pit	Filled by 35	Unknown	
33	Deep oval shaped pit	Filled by 34	Unknown	
34	Fill of cut 33	Single brownish grey fill	Unknown	
35	Fill of pit 32	Single brownish grey fill	Unknown	AA, Bulk sample 20 litres
36	Fill of ditch 12	Fill of ditch/ gully 12	Pre-medieval	AA, Bulk sample 20 litres
37	Shallow oval pit	Filled by 39	Unknown	
38	Spread of clay and charcoal		Unknown	AA, Bulk sample and C14 sample 10 litres, containing charcoal.
39	Fill of pit 37	Dark greyish brown fill	Unknown	AA, Bulk sample 30 litres. 1.9g of charcoal (*quecus*). 3 charred seeds
40	Shallow irregular pit	Filled by 43	Unknown	
41	Cut of tree throw	Filled by 42	Unknown	
42	Fill of tree throw 41	Mid brown silty clay	Unknown	
43	Fill of pit 40	Light greyish silty clay	Unknown	AA, Bulk sample 10 litres
44	Irregular shallow feature	Filled by 45	Unknown	
45	Fill of cut 44	Burnt material within feature 44	Unknown	
46	Oval shaped pit	Filled by 47 and 49	Unknown	
47	Fill of pit 46		Unknown	AA, Bulk sample 30 litres. 3 charred seeds, 1 hammerscale
48	Fill of ditch/ gully 12		Pre-medieval	AA, Bulk sample 40 litres
49	Fill of pit 46		Unknown	
50	Segment 1 of ditch	Filled by 58	Pre-medieval	
50	Segment 3 of ditch	Filled by 51	Pre-medieval	

Context	Interpretative description	Details	Period	Finds and sample information
50	Segment 4 of ditch	Filled by 82	Pre-medieval	
50	Segment 2 of ditch	Filled by 106	Pre-medieval	
51	Fill of ditch 50	Fill of ditch/ gully 50	Pre-medieval	AA, Bulk sample 20 litres. 5 fragments of fired clay (4g)
52	Ditch	Linear running east to west	Pre-medieval	
53	Posthole	Posthole filled by 54 and 56	Bronze-age to Iron-age	
54	Fill of posthole 53	Secondary fill within posthole	Middle or Late Iron Age	AA Bulk sample 10 litres. 2.4g of charcoal (including *quercus* and *betula*). 2 charred *hordeum* grains, 1 charred *hordeum* chaff and 5 charred seeds. Containing a hard-hammered heat-affected flint flake. *Hordeum* grain radiocarbon dated to 180-46 calBC (95%) (SUERC-84360).
55	Coal vein within the natural		n/a	
56	Fill of posthole 53	Primary fill within posthole	Middle or Late Iron Age	AA, Bulk sample 40 litres. 8.3g of charcoal (including *quercus*, *betula* and *corylus*). 3 charred seeds.
57	Coal vein within the natural		n/a	AA, Bulk sample 20 litres
58	Fill of ditch 50	Fill of ditch/ gully 50 segment 1	Pre-medieval	AA, Bulk sample 10 litres
59	Shallow oval pit	Filled by 60	Unknown	
60	Fill of pit 59	Pale orange brown fill	Unknown	AA, Bulk sample 40 litres
61	Over cutting of ring gully	Filled with natural clay numbered as 62	n/a	
62	Overcut natural clay	natural clay	n/a	AA, Bulk sample 20 litres
63	Fill of ditch 12	Fill of cut 12, overlain by 67	Pre-medieval	AA, Bulk sample 20 litres
64	Fill of gully oval 65		Middle or Late Iron Age	
65	Oval gully	Filled by 87	Middle or Late Iron Age	
65	Oval gully	Filled by 81	Middle or Late Iron Age	
65	Oval gully	Filled by 89	Middle or Late Iron Age	
65	Oval gully	Filled by 88	Middle or Late Iron Age	
65	Oval gully		Middle or Late Iron Age	
65	Oval gully	Filled by 92	Middle or Late Iron Age	
65	Oval gully	Filled by 93	Middle or Late Iron Age	
65	Oval gully	Filled by 96	Middle or Late Iron Age	

Context	Interpretative description	Details	Period	Finds and sample information
65	Oval gully	Filled by 94	Middle or Late Iron Age	
65	Oval gully	Filled by 95	Middle or Late Iron Age	
66	Gully	Filled by68	Unknown	
67	Fill of ditch 12	Secondary fill within ditch/gully	Pre-medieval	
68	Fill of gully 66	Light brownish grey fill	Unknown	AA, Bulk sample 30 litres
69	Rectangular cut	Filled by 74	Unknown	
70	Fill of ditch 12	Fill of cut 12, overlying 71	Pre-medieval	AA, Bulk sample 20 litres
71	Fill of ditch 12	Fill of cut 12, overlain by 70	Pre-medieval	
72	Hedgerow	Filled by 73	Modern	
73	Fill of hedgerow 72	Mid brownish grey silt and stone deposit	Modern	
74	Fill of 69	Single loose yellow sandy clay	Unknown	AA, Bulk sample 10 litres
75	Fill of ditch 12	Fill of cut 12, overlying 80	Pre-medieval	AA, Bulk sample 20 litres. 1 charred *triticum* grain.
76	Circular pit cut	Filled by 77	Unknown	
77	Fill of pit 76	Mid orange brown silty-clay	Unknown	AA, Bulk sample 10 litres
78	Gully	Short linear aligned north-south. Filled by 79	Unknown	
79	Fill of gully 78	Mid brown grey silt clay	Unknown	
80	Fill of ditch 12	Fill of cut 12, overlain by 75	Pre-medieval	
81	Fill of oval gully 65	Mid reddish brown grey silty clay	Middle or Late Iron Age	
82	Fill of ditch 50	Fill of ditch/ gully in segment 4	Pre-medieval	AA, Bulk sample 40 litres. 1.3g of charcoal (including *betula*, *maloideae*, *corylus* and *quercus*). 1 spelt wheat chaff, 3 charred seeds.
83	Fill of ditch 12	Fill of ditch 12 overlain by 84	Pre-medieval	AA, Bulk sample 20 litres
84	Fill of ditch 12	Fill of ditch 12 underlying deposit 83	Pre-medieval	
85	Oval shaped pit	Filled by 86	Unknown	
86	Fill of pit 85	Light blue greyish silty clay	Unknown	
87	Fill of oval gully 65	Reddish brown grey clay deposit	Middle or Late Iron Age	AA, Bulk sample 20 litres. 1.2g of undetermined hardwood charcoal.

Context	Interpretative description	Details	Period	Finds and sample information
88	Fill of oval gully 65	Dark greyish brown fill	Middle or Late Iron Age	AA, Bulk sample 20 litres. 1 *triticum* grain, 1 *hordeum* chaff, 2 charred seeds, 1 hammerscale
89	Fill of oval gully 65	Reddish brown grey clay deposit	Middle or Late Iron Age	AA, Bulk sample 40 litres. 1 *avena* grain, 2 charred seed. 2 fragments of medium mammal long-bone (1.2g). *Avena* grain radiocarbon dated to c. calAD 1259-1377 (95%) (SUERC-84361).
90	Curvilinear feature	Filled by 91	Unknown	
91	Fill of feature 90	Mid reddish brown grey silty clay	Unknown	
92	Fill of oval gully 65	Mid greyish brown silty clay	Middle or Late Iron Age	AA, Bulk sample 20 litres. 1 charred *hordeum* grain, 1 charred *triticum* grain, 4 charred seeds. 0.1g of undetermined hardwood charcoal. *Triticum* grain radiocarbon dated to 168-41 calBC (95%) (SUERC-84362).
93	Fill of oval gully 65	Dark greyish brown fill	Middle or Late Iron Age	AA, Bulk sample 10 litres.
94	Fill of oval gully 65	Mid greyish mottled brown silty clay	Middle or Late Iron Age	AA, Bulk sample 20 litres.
95	Fill of oval gully 65	Dark greyish brown fill	Middle or Late Iron Age	AA, Bulk sample 20 litres.
96	Fill of oval gully 65	Pale orange brownish grey fill	Middle or Late Iron Age	AA, Bulk sample 10 litres, 1 hammerscale
97	Single fill within shallow pit 98	Mid silver greyish brown silty clay fill	Unknown	AA, Bulk sample 20 litres
98	Circular shallow pit cut	Filled by 97	Unknown	
99	Circular oval pit cut	Filled by 100	Middle or Late Iron Age?	
100	Single fill within shallow pit 99	Loose dark greyish brown silty clay	Middle or Late Iron Age?	AA, Bulk sample 10 litres. 3 charred seeds (including 1 sun spurge) Carbonised sun spurge seed radiocarbon dated to post AD 1950.
101	Single fill of pit 102	Mid blue greyish brown silty clay	Unknown	AA, Bulk sample 40 litres
102	Elongated oval pit	Filled by 101	Unknown	
103	Posthole cut/ small pit	Filled by 104	Middle or Late Iron Age?	
104	Fill of posthole/ pit 103	Mottled orange brown silty clay	Middle or Late Iron Age?	AA, Bulk sample 10 litres. 1 charred *avena* grain.
105	Possible fragmentary remains of a hearth	Next to posthole 53, almost central to ring gully 65	Unknown	
106	Fill of ditch 50	Loose dark greyish brown silty clay	Pre-medieval	AA, Bulk sample 20 litres
107	Gully	Filled by 109	Unknown	AA, Bulk sample 20 litres.

Context	Interpretative description	Details	Period	Finds and sample information
108	Fill of ditch 50	Fill of ditch/ gully 50	Pre-medieval	AA, Bulk sample 20 litres
109	Primary fill within gully 107	Lower fill consisting of dark brown silty clay	Unknown	AA, Bulk sample 10 litres
110	Secondary fill within gully 107	Upper fill consisting of mid grey brown silty clay	Unknown	AA, Bulk sample 10 litres

APPENDIX B

LITHICS ASSESSMENT

Dr Frederick W. F. Foulds

INTRODUCTION

This report presents an assessment of lithic material recovered during archaeological mitigation works carried out on land east of The Nursery, Medburn, Northumberland (NGR: NZ 1360 7049). The work was carried out by Northern Archaeological Associates in advance of residential development. A total of nine lithics were provided for assessment, of which four were determined to be natural in origin and will not be discussed further. The worked artefacts present a small assemblage with Mesolithic and Neolithic affinities.

METHOD

Recording took place on 4th October 2018 and was carried out in accordance with existing guidelines (Watkinson and Neal 2001; CIfA 2014). Where reference to specific guidance within the literature on stone tools has been made, this is stated in the method statement below. All material was inspected by eye and logged in a database using Microsoft Access. Variables are described as follows:

Site Information

Field No.	Field number, if applicable
Area	Area, if applicable. If the artefact is unstratified, this is noted here
Trench	Trench number or code, if applicable
Context No.	The context number
Sample code	Sample code, if relevant
RF No.	Recorded find number, if applicable
Quantity	Number of pieces. Usually '1' and used to calculate total numbers
Flint No.	A unique number assigned for the purposes of the lithic catalogue

Raw material

Material	Whether flint, chert, quartz etc
RM colour	A description of the colour of the raw material
Cortex	The amount of cortex present, expressed as a percentage value. In the case of flakes and flake tools, this is expressed as the percentage of the dorsal surface
Cortex colour	A description of the colour of the cortex, where present
Patina	The amount of patination of the surface, excepting cortex, expressed as a percentage value
Patina colour	A description of the colour of the patination, where present

Technology

Type	The type of artefact, e.g. 'flake', 'blade', 'debitage', 'core', 'burnt fragment', or tool types, such as 'scraper', 'arrowhead', 'burin'
Debitage type	If identified as debitage, this provides the type as a sub category, e.g. 'indeterminate fragment', 'chip', 'shatter' etc
Size	Individual measurements have not been taken at this stage. Sizes are provided in millimetres, with the maximum dimension, or in the case of flakes, maximum length, given
Percussion	The angle of percussion used to remove a flake or blade-angle

Reduction	Stage of the knapping sequence, given as 'primary', 'secondary' or 'tertiary,' sequence. The term 'thermal' is used to note heat fracture
Platform type	The type of platform (for flakes, where present), based on Andrefsky (2005, 96), i.e. 'cortical', 'flat', 'complex', or 'abraded'
Bulb	A description of the bulb of percussion (where present), recorded as 'pronounced', or 'diffuse'
Fracture type	The type of termination based on Cotterell and Kamminga (1987), i.e. 'feathered', 'step', 'hinge', or 'overshoot'
Working	A description of working, e.g. 'abrupt', 'invasive' etc

Retouch

Retouch	An indicator of whether retouch is present. Where retouch is visible, the following categories, are recorded, based on Ballin (2002)
Retouch type	The type of retouch present, recorded as 'edge', 'invasive' and 'complete'
Retouch extent	Extent of retouch, recorded as either 'continuous' or 'sporadic'
Retouch orientation	Orientation of the retouch, whether originating from the ventral ('normal') or dorsal ('inverse'), or 'alternating', 'propeller' or 'bifacial'
Retouch fineness	The fineness of the retouch, ranging from 'very fine' to 'very coarse'
Retouch morphology	The morphology of the retouch
Retouch angle	The angle that the retouch has been applied at, ranging from 'very acute' to 'obtuse'

Damage

Burnt	This column uses an ordinal scale to indicate the exposure to burning an item has received. 0 = unburnt; 1 = lightly fired (surface smoothing, light crazing); 2 = fired (surface and interior patination, surface cracks, but still retaining original form); 3 = heavily fired (complete surface and interior patination, pot lid fractures, shattering, original form cannot be determined)
Damage	Description of any other damage present, e.g. 'plough', 'frost', 'edge chipping' etc

Interpretation

Period	Where the artefact is chronologically distinctive then the period is noted. Typological assessments are carried out in accordance with Butler (2005)
Interpretation	A description of the lithic(s), including an indication of further working, e.g. 'retouch' or 'edge use'
Notes	A further field to note any other observations, i.e. if items refit

RAW MATERIAL

All of the artefacts were produced from flint. This was predominantly brown to yellow-brown in colour, with only two pieces being grey. Residual cortex was absent in all bar one case and even here the amount remaining was limited. This suggests that the assemblage was restricted to later stage reduction, although its small size precludes any firm conclusions about core working in the vicinity. Patina was generally absent and was only present in one case; this presented as calcination of the outer surface and was accompanied by crazing and minor thermal damage, suggesting this piece had been heated or partially burnt.

The type of raw material recovered is consistent with that found within the surficial deposits within the area, which consist of Devensian till. Flint of these types and colours has been recorded in the region by Young (1987). It is therefore likely that much, if not all, of the material is local in origin.

TECHNOLOGY

The flint artefacts were differentiated according to type (Table 1) and are discussed accordingly below.

Table B1: composition of the worked assemblage according to type

Knapped Form	Quantity
Flakes	3
Blades/bladelets	2
Total	5

In total, the artefacts consisted of three flakes, a fragment of a broad blade and a narrow bladelet. Both blades displayed significant, fine edge damage restricted to parts of a single lateral edge, which may have possibly been caused by use, probably as simple knives. The flakes were undiagnostic, of any particular period with two being soft hammer and one being hard hammer in origin. A single, thin flake with a curved, twisting profile may have resulted from thinning. The larger, thicker hard hammer flake, which was found in the fill of posthole 53, was observed to have some thermal damage and thus may have possibly been burnt. It also had a large potlid scar on the dorsal, which may also have resulted from burning. The remaining flints were all found in the topsoil

DISCUSSION

The assemblage is small and thus does not provide enough information for a conclusive statement about its origins to be made. The raw material was most likely sourced from the surrounding glacial drift. A date is difficult to assign, although the presence of bladelets and blades suggests a Mesolithic or Neolithic date. The bladelet may be either Late Mesolithic or Early Neolithic in date, while the broad blade may be Early Mesolithic or Early Neolithic in date. The flakes are unfortunately undiagnostic, although the predominance of soft hammer technique is consistent with core reduction strategies associated with these periods. Overall, the assemblage provides further evidence of the presence of prehistoric flint-working activity within Northumberland, as demonstrated by other sites in the local area (see for example Waddington 2004).

RECOMMENDATIONS

The worked material should be retained. However, no further analysis is required.

REFERENCES

Andrefsky, W. (2005) *Lithics: Macroscopic Approaches to Analysis. Second Edition*. Cambridge: Cambridge University Press.

Ballin, T. B. (2000) Classification and description of lithic artefacts: a discussion of the basic lithic terminology. *Lithics* **21**, 9–15.

Butler, C. (2005) *Prehistoric Flintwork*. Stroud: Tempus Publishing.

Chartered Institute for Archaeologists (CIfA) (2014) *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Reading: Chartered Institute for Archaeologists.

Cotterell, B. and Kamminga J. (1987) The Formation of Flakes. *American Antiquity* **52**(4): 675–708.

Waddington, C. (2004) *The Joy of Flint*. Newcastle Upon Tyne: Museum of Antiquities.

Watkinson, D. & Neal, V. (2001) *First Aid for Finds*. Hertford: Rescue/UKICAS.

Young, R. (1987) *Lithics and Subsistence in North-Eastern England: aspects of the prehistoric archaeology of the Wear Valley, Co. Durham, from the Mesolithic to the Bronze Age*. BAR British Series 161. Oxford: Archaeopress.

APPENDIX C

MEDIEVAL AND POST-MEDIEVAL POTTERY ASSESSMENT

Charlotte Britton

INTRODUCTION

A total of 18 sherds (289.1g) of medieval and post-medieval pottery was recovered during the 2018 excavations on land east of The Nursery, Medburn, Northumberland (NZ 1360 7049). All the pottery was recovered from a single unstratified context and was quantified by count and weight. As the assemblage was recovered exclusively from topsoil it provides little information about the features excavated beyond indicating domestic use in the area during the medieval and post-medieval periods.

METHOD

This report presents the results of the assessment of the material examined in accordance with current standards (Watkinson and Neal 2001; CIfA 2014; Barclay *et al*. 2016). All the material recovered was assessed by eye on 5th October 2018. Wares and periods were identified (Table C2) with the aid of NAA's pottery reference collection. Vessel form and decoration were documented where practicable.

Table C1: Wares present in each context with date range, count and weight

Ware	Period	Count	Weight (g)
Buff Sandy ware	12th - 13th century	1	13.4
Gritty ware	12th - 14th century	3	46
Oxidised sandy gritty ware	12th - 13th century	2	8.1
Reduced sandy ware	Late 12th - 13th century	1	4.2
Sandy ware	12th - 13th century	3	25.4
Slipware	18th century	2	1.8
Stoneware	19th century	1	158.2
Whiteware	19th century	5	32
Total		18	289.1

RESULTS

The assemblage dated to the medieval (12th–14th centuries) and post-medieval (18th–19th centuries) periods and was classified exclusively as domestic ware. The area excavated was potentially utilised as agricultural fields in the medieval period and was close to the villages of Ponteland, Eachwick, Dalton and Dissington, all of which are thought to have had medieval origins (Ekwall 1960). Domestic buildings were later erected in the vicinity, including Dissington Old Hall during the 17th century and Old Dissington farmhouse and out-buildings in the 19th

century. The domestic nature of the pottery recovered during the excavations suggests that it could have derived from these sites.

The assemblage represented a maximum of 12 vessels and was exclusively recovered from topsoil (1). All the pottery was in good condition, British in origin and was most likely produced within the local region. Both the wares and forms identified were highly characteristic of the corresponding periods.

The medieval wares made up 56% of the assemblage and included: buff sandy ware, gritty wares, oxidised sandy gritty ware, reduced sandy ware and sandy ware. Three sherds of different fabrics displayed evidence of green glaze on their external surfaces. Lead glazes were highly characteristic of the medieval period and typical for the region. As the sherds recovered were fragmentary, specific forms were difficult to identify; however, they most likely exclusively took the form of hollow wares.

The post-medieval wares included: slipware, stoneware and whiteware. The forms identified were, again, typical for the period, including flat-wares, such as a plate, and various hollow wares. These included one complete vessel, a small brown salt-glazed bottle with a 30mm rim and 80mm depth, most likely used to hold or store ink.

RECOMMENDATIONS

All the pottery recovered was dated from to the 12th–14th centuries or the 18th–19th centuries. It was in very good condition. However, it is recommended for discard, as it is highly characteristic of the periods and region, and exclusively came from an unstratified context.

REFERENCES

Barclay, A., Knight, D., Booth, P., Evans, J., Brown, D. & Wood, I. (2016) *A Standard for Pottery Studies in Archaeology*. Prehistoric Ceramics Research Group, Study Group for Roman Pottery & Medieval Pottery Research Group.

Chartered Institute for Archaeologists (CIfA) (2014) *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Reading: Chartered Institute for Archaeologists.

Watkinson, D. and Neal, V. (2001) *First Aid for Finds*. Hertford: Rescue/UKICAS.

APPENDIX D

CBM, FIRED CLAY AND STONE ASSESSMENT

Chrystal M. L. Antink

INTRODUCTION

This report discusses the ceramic building material (CBM), fired clay and stone recovered during archaeological mitigation works carried out on land east of The Nursery, Medburn, Northumberland (NGR: NZ 1360 7049) in 2018. None of the material was clearly identifiable or diagnostic of date.

METHOD

The recording of CBM, stone, and fired clay took place in October 2018. Fragments of CBM were examined following appropriate guidance and standards (Watkinson and Neal 2001; Archaeological Ceramic Building Materials Group 2002; CIfA 2014) and recorded in a Microsoft Office Excel spreadsheet. The context, material, object type, count, weight, and period were recorded where available.

RESULTS

The assemblage consisted of 12 fragments (292g) in total (Table D3). They were recovered from context 01, the topsoil; context 31, the lower fill of furrow 27; and context 51, the fill of ditch or gully 50.

Table D3: Finds recorded by context

ID	Context	Material	Object	Count	Weight (g)	Period	Notes
1	1	Fired clay		3	89	Unknown	Fragments of lightly/unevenly fired clay; possible surface.
2	51	Fired clay		5	4	Unknown	Small tumbled fragments of fired iron-rich clay.
3	1	Stone	Fossiliferous limestone	1	9	Natural	Fragment of natural fossiliferous limestone.
4	31	Stone	Architectural?	1	159	Unknown	Fragment of sandstone with four parallel V-shaped chisel marks remaining on one face; unclear if any other surfaces are complete.
5	1	CBM	Tile	2	31	Unknown	Two fragments of different tiles, each sanded on one face, approximately 13mm thick; too fragmentary to determine period.
Totals				12	292		

Only the possible architectural stone fragment from context 31 was of particular interest. It had four parallel V-profiled chisel marks on one face, but it was unclear if any of the other faces were intact.

None of the objects in the assemblage could be attributed to a period.

RECOMMENDATIONS

The artefacts discussed here do not contribute significantly to the understanding of the site and no further study is required. It is recommended they be discarded before the site archive is deposited, apart from the architectural fragment, which may be retained at the depositing museum's discretion.

BIBLIOGRAPHY

Archaeological Ceramic Building Materials Group (2002) *Minimum Standards for Recovery, Curation, Analysis, and Publication for Ceramic Building Material Draft Minimum Standards*. (Unpublished draft).

Chartered Institute for Archaeologists (CIfA) (2014) *Standard and guidance for the collection, documentation, conservation and research of archaeological materials*. Reading: Chartered Institute for Archaeologists.

Watkinson, D. and Neal, V. (2001) *First Aid for Finds*. Hertford: Rescue/UKICAS.

APPENDIX E

ANIMAL BONE ASSESSMENT

Hannah Russ

INTRODUCTION

Animal bone was recovered from two contexts during archaeological excavations at Medburn, Northumberland, in 2018. The material included both hand-collected bone, and bone recovered from bulk environmental samples.

METHOD

The animal remains were identified to element, side and to as low a taxonomic level as possible using the author's reference collection and published identification guides (Hillson 2003; 2005). Quantification used the diagnostic zone method as presented by Dobney and Rielly (1988). A taphonomic assessment of each fragment was undertaken, recording the presence and absence of cut and chop marks, burning and calcination, any evidence for animal activity (canid or rodent gnawing) and surface preservation; any other surface modifications of note were also recorded. At this stage, no attempt was made to sex any of the remains, or to measure any elements. Sheep (*Ovis* sp.) and goat (*Capra* sp.) distinction was also not considered. Fragments of bones that could be identified to element but not any specific species were grouped as far as possible using size and class or order categories.

RESULTS

In total, five fragments of animal bone were recovered (Table E1). In all cases, the remains could represent either wild or domestic animals.

Three fragments of bone representing the remains of large mammal(s) were recovered via hand collection from context 01 (topsoil). Two of these fragments refitted and formed a section of rib. The third fragment could not be identified to any specific element other than 'long bone'. The category 'large mammal' in this context would include taxa such as cattle (*Bos*), horse (and other equids - *Equus*), and red deer (*Cervus elaphus*). As these remains were recovered from topsoil, no further discussion is presented.

Species-level identification was also not possible for the two fragments of bone recovered from a bulk environmental sample taken from context 89 (fill of ring-gully 65). The bones from this context represented the remains of smaller animal(s) than those recovered from context 01, with cortical bone thickness, size and shape suggesting medium-sized mammal(s). The category 'medium mammal' in this context would include (but not limited to) animals such as sheep/goat (*Ovis/Capra*), roe deer (*Capreolus capreolus*), and wolf or dog (*Canis* sp.).

The animal bone from context 89 was recovered from the fill of a ring-gully (65), which has been interpreted, along with associated postholes, as the remains of an oval structure of unknown function. Their presence in this ring-gully fill may suggest they are associated with activities

contemporary with the use of the structure; however, the bone could date to any time after gully construction.

The material from context 01 was in very poor condition, with all three fragments displaying surface pitting, surface weathering and modern breaks. The two fragments from context 89 were in slightly better condition, though still poor. No evidence for carcass processing (cut or chop marks), burning or animal interaction in the form of gnawing was observed. None of the material could provide any information regarding age at death or sex.

Table E1. Animal bone from Medburn, Northumberland (MED18). MNE – minimum number of elements

Context	Count	MNE	Weight (g)	Identification	Preservation
01	2	1	7.0	Large mammal rib	Very poor: surface pitting, weathering and modern breaks
01	1	1	6.0	Large mammal long-bone shaft fragment	Very poor: surface pitting, weathering and modern breaks
89	2	\	1.2	Medium mammal long-bone shaft fragments	Poor: surface pitting and weathering
Total	5	>2	14.2		

DISCUSSION

The limited size, poor preservation and absence of any remains that could be identified at genus level or below preludes any detailed interpretation regarding the role of animals in the past at Medburn. The assemblage attests to the presence of large and medium mammal(s) at the site, though none of the material could be reliably associated with any specific period or type of activity. The poor preservation observed in the recovered assemblage suggests that further remains, if ever present, could have been completely lost through post-depositional processes including burial conditions not conducive to bone preservation. No pH data was available for context 01, but context 89 had a neutral pH reading of 7.1, which should not lead to poor bone preservation. Site-wide, the pH readings varied between neutral and slightly acidic (7.4 to 6.1 inclusive) suggesting that pH levels may have contributed to bone loss more generally, but that other factors likely play a greater role in the destruction of osseous material at Medburn.

RECOMMENDATIONS

Due to small assemblage size and poor state of preservation, no further analysis is recommended. On completion of the project the animal bone assemblage may be discarded.

REFERENCES

Dobney, K. and Rielly, K. (1988) A method for recording archaeological animal bones: the use of diagnostic zones. *Circaea* **5**, 79–96

Hillson, S. (2003) *Mammal Bones and Teeth. An introductory guide to methods of identification*. London: Institute of Archaeology, University College London.

Hillson, S. (2005) *Teeth. Second Edition*. Cambridge Manuals in Archaeology. Cambridge: Cambridge University Press.

APPENDIX F

ARCHAEOBOTANY ASSESSMENT

Jonathan Baines

INTRODUCTION

A total of 18 bulk environmental samples, taken during archaeological investigations at land east of The Nursery, Medburn, Northumberland (NZ 1360 7049), were examined for charred plant remains. A few fragments of native hardwood charcoal were identified as well as a small assemblage of cereals and seeds.

METHOD

The bulk environmental samples were processed at NAA in October 2018 with 0.5mm retention meshes using the Siraf method of flotation (Williams 1973). All sampling and analyses were carried out in conformance to Historic England (Campbell *et al*. 2011) guidelines and standards. The plant remains and charcoal were identified to species as far as possible using Schweingruber (1990), Hather (2000), Cappers *et al*. (2006), Jacomet (2006) and the NAA reference collections.

RESULTS

Coal

Context	Sample	Weigh (g)t
6	aa	2.5
82	aa	0.3
89	aa	0.5
92	aa	0.8
95	aa	0.3
100	aa	0.7

Charcoal

Context	Sample	Weigh (g)t	ID	Amount %	Common
6	aa	73	*prunus*	60	stone fruit
6	aa		*maloideae*	40	apple subfamily
8	aa	27.4	*maloideae*	45	apple subfamily
8	aa		*fraxinus*	25	ash
8	aa		*betula*	30	birch
8	ab	137.3	*maloideae*	45	apple subfamily
8	ab		*alnus / corylus*	20	alder / hazel
8	ab		*fraxinus*	15	ash

Context	Sample	Weigh (g)t	ID	Amount %	Common
8	ab		*prunus*	15	stone fruit
8	ab		*ilex*	5	holly
39	aa	1.9	*quercus*	100	oak
54	aa	2.4	*corylus*	50	hazel
54	aa		*betula*	50	birch
56	aa	8.3	*betula*	50	birch
56	aa		*corylus*	25	hazel
56	aa		*quercus*	25	oak
82	aa	1.3	*betula*	40	birch
82	aa		*maloideae*	20	apple subfamily
82	aa		*corylus*	20	hazel
82	aa		*quercus*	20	oak
87	aa	1.2	undet. Hardwood		
92	aa	0.1	undet. Hardwood		

Charred seeds and fruit

Context	Sample	ID	Amount	Feature
8	aa	undet. Cereal	2	pit
8	aa	*Triticum sp.*	1	pit
8	ab	*Triticum sp.*	1	pit
39	aa	*Carex (trigonous)*	1	pit
39	aa	*Poaceae* 2-5mm	2	pit
47	aa	*Galium sp.*	1	pit
47	aa	undetermined 2-5mm	2	pit
54	aa	*Hordeum*	2	posthole
54	aa	*Poaceae* 2-5mm	1	posthole
54	aa	barley chaff	1	posthole
54	aa	*Poaceae* < 2mm	1	posthole
54	aa	*Carex (trigonous)*	2	posthole
54	aa	*Lamiaceae*	1	posthole
56	aa	*Poaceae* 2-5mm	1	posthole
56	aa	*Poaceae* < 2mm	1	posthole
56	aa	*Brassica sp.*	1	posthole
75	aa	*Triticum sp.*	1	ditch/gully
82	aa	*Poaceae* < 2mm	2	ditch/gully
82	aa	spelt chaff	1	ditch/gully
82	aa	*Carex (trigonous)*	1	ditch/gully
88	aa	*Triticum sp.*	1	ring gully
88	aa	*Poaceae* 2-5mm	2	ring gully
88	aa	barley chaff	1	ring gully
89	aa	*Avena*	1	ring gully
89	aa	*Poaceae* 2-5mm	2	ring gully

Context	Sample	ID	Amount	Feature
92	aa	*Hordeum*	1	ring gully
92	aa	*Poaceae* < 2mm	3	ring gully
92	aa	*Poaceae* 2-5mm	1	ring gully
92	aa	*Triticum sp.*	1	ring gully
100	aa	*Euphorbia helioscopia*	1	pit
100	aa	*Poaceae* 2-5mm	2	pit
104	aa	*Avena*	1	posthole/pit

DISCUSSION

The barley may be more closely identified as hulled, or free-threshing (*Hordeum vulgare*), due to the recovery of a spikelet fork from the fill (88) of ring-gully 65 and residues of glumes adhering to some of the kernels. Though the spelt spikelet fork (*Triticum spelta*) identified in the fill (82) of ditch 50 suggests this species was consumed. Differentiation by grain morphology alone is not sufficient for a secure species-specific recording of the five grains from the other fills. Similarly, due the absence of accompanying chaff remains, it was not possible to differentiate between domesticated or wild oats (*Avena sativa* and *fatua* respectively).

Evidence of ridge and furrow ploughing of a medieval or later date was observed during the excavation. It is likely that the oat grain recovered from ring-gully 65 (fill 89) that was radiocarbon dated to the medieval period (Appendix G) may have been intrusive from this activity.

Sun spurge (*Euphorbia helioscopia*) is a ruderal archaeophyte from the Mediterranean basin and very rare in Britain before the Middle Ages. It is therefore unsurprising that radiocarbon dating identified it as from the nuclear era (post 1950).

The sedges (*Carex* sp.), mustard (*Brassica* sp.), mint family (*Lamiaceae*) and undetermined small grasses are a common component of meadows and swards. Though they could indicate burnt remains of animal fodder, bedding or refuse clearance, they may have inadvertently charred during unrelated on-site activities.

It is not possible, with the available evidence, to exclude exploitation of the naturally occurring bituminous or anthracite coal as fuel.

Holly (*Ilex aquifolium*) is not a common component of prehistoric charcoal assemblages. The few fragments from context 8 are thus possibly the remains of an artefact.

The high proportion of pomaceous wood (*Maloideae* (hawthorn, rowan, medlar, whitebeam, pear or apple) and stone fruit (*Prunus* sp.) suggests opportunistic exploitation of the surrounding tree cover as fuel for domestic fires as these trees do not produce thick or great firewood.

Identification of hazel (*Corylus avellana*), ash (*Fraxinus excelsior*) and birch (*Betula* sp.) suggests the presence of moist woodlands in the area. No clear signs of coppicing was recognised in these fragments. Though these trees were often used in construction, wattling or for the production of tools and other artefacts, no clear signs for such usage were recognised. The overall dominance

of oak in the charcoal assemblage reflects its ubiquity in British woodlands and its status as a good fuel.

REFERENCES

Cappers, R. T. J., Bekker, R. M. and Jans, J. E. A. (2006) *Digitale Zadenatlas Van Nederland: Digital Seed Atlas of the Netherlands*. Groningen: Barkhuis Publishing.

Hather, J. G. (2000) *The Identification of the Northern European Woods: A Guide for Archaeologists and Conservators*. London: Archetype.

Campbell, G., Moffett, L. & Straker, V. (2011) *Environmental Archaeology. A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-Excavation (second edition)*. Swindon: English Heritage.

Jacomet, S. (2006) *Identification of Cereal Remains from Archaeological Sites. 2nd Edition*. Archaeobotany Lab. Basel: IPAS, Basel University.

Schweingruber, F. H. (1990) *Microscopic Wood Anatomy. 3rd Edition*. Swiss Federal Institute for Forest, Snow and Landscape Research.

Williams, D. (1973) Flotation at Siraf. *Antiquity* **47**, 198-202.

APPENDIX G

RADIOCARBON DATING

Gav Robinson

INTRODUCTION

The importance of radiocarbon dating is clearly stated multiple times in all current regional, national and thematic research framework documents (for example Spikins 2010, 10; Vyner 2008, 24; Chadwick 2009, 7-9; Manby, King and Vyner 2003, 42; Haselgrove *et al*. 2001, 3-7; Petts and Gerrard 2006, 130-1, 136-7; Brennand 2007, e.g. 34, 38-9; EH 2010, 12; Blinkhorn and Milner 2014, 33-4). Most of these guideline documents also highlight that multiple dating of the same material or context and the use of statistical analysis to refine the date ranges achieved are routine requirements for most projects (Chadwick 2009, 9; Manby, King and Vyner 2003, 42; Haselgrove *et al*. 2001, 3-7; Petts and Gerrard 2006, 130-1, 136-7). This need for modelling is further stated by Whittle *et al*. (2011, 18-9) in their extensive analysis of Neolithic enclosures of southern Britain.

With regard to the Medburn project, the significance of the potential early and later prehistoric remains, and the paucity of datable artefacts, there was a clear need for independent dating. Furthermore, there was a need to date the regionally significant unenclosed oval structure. However, due to unfavourable ground conditions, there was a lack of suitable material. The majority of the sampled contexts only produced small amounts of charcoal, additionally, there was a high level of truncation of the features. A total of five samples (excluding the initial failure from context 8) were submitted to the Scottish Universities Environmental Research Centre AMS Facility (SUERC) for radiocarbon dating (Table G1).

During the analysis associated with this project, Bayesian modelling (Naylor and Smith 1988; Bayliss 2009; Whittle *et al*. 2011, 19-59; Bayliss 2015) of some of the radiocarbon dates was undertaken using OxCal v4.3.2 (Bronk Ramsey 2017). The aims and objectives of this and the models utilised are detailed below. The brackets and keywords used in the associated diagram define the OxCal models used. Within the text (and tables) the models and queries used are indicated by keywords in bold. Calculated posterior ranges were rounded outwards to 5 years (Bayliss *et al*. 2011, 21).

The measured 14C ages presented in Table G1 are quoted in conventional years BP (before 1950 AD). The associated error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error. The calibrated age ranges were determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4.3.2; Bronk Ramsey 1995; 2009) using the IntCal 13 atmospheric curve (Reimer *et al*. 2013).

All calibrated radiocarbon dates reproduced in the text, unless stated otherwise, represent calibrated calendar years (cal AD or cal BC) at a probability of 95.4%. Modelled 'posterior density estimates' (Whittle *et al*. 2011, 21) are presented in italics.

Table G1: Radiocarbon dating results

Context	Interpretative description	Lab Code	Material	δ 13C relative to VPDB (‰)	Radiocarbon result BP	Calibrated date range (at 95.40%) (cal. BC)
8	Fill of pit 9	n/a	Wheat grain	n/a	FAIL	
8	Fill of pit 9	SUERC-84957	Prunus charcoal	-25.4	3434±24	1874 (9.6%) 1843 calBC 1816 (2.8%) 1799 calBC 1779 (83.0%) 1664 calBC
54	Fill of posthole 53	SUERC-84360	Barley grain	-24.4	2091±24	180-46 calBC
89	Fill of ring gully 65	SUERC-84361	Oat grain	-24.1	716±24	calAD 1259-1299 calAD 1373-1377
92	Fill of ring gully 65	SUERC-84362	Wheat grain	-25.0	2072±21	168-41 calBC
100	Fill of pit 99	SUERC-84363	Sun Spurge seed	-26.3	1.2144±0.0029	Post 1950 AD

AIMS AND OBJECTIVES

The aim of the Bayesian modelling was linked to that of the initial radiocarbon analysis, which was to provide a chronology for the recorded remains and ecofacts recovered to aid their interpretation. The updated objectives of both of these programmes of analysis were:

- to help understand the length of activity on the site;
- to attempt to date the use of the pit clusters and the oval structure;
- to enable a comparison of the recorded remains within the local and wider region.

METHODOLOGY

The selection of material for submission and an understanding of the depositional processes that led to their inclusion within the contexts are both crucial to achieving a meaningful interpretation of the returned measurements (see Bayliss 1998; Ashmore 1999; Gibson and Bayliss 2009, 41, 67-72; Haselgrove *et al.* 2001, 5; Bayliss 2009, 129; Bayliss 2015, 683-90). Where possible, the material dated was from relatively short-lived items (including grain and seeds) and short-lived charcoal was favoured over longer-lived species; timbered or heartwood fragments were avoided. In this way potentially artificially old dates created by the 'old wood effect' (Waterbolk 1971; Gillespie 1984; Aitken 1990) were minimised.

The pool of material available from the Medburn contexts comprised small amounts of charred material with few accumulations (such as discrete dumped lenses). This issue increased the chance that any material chosen for dating was intrusive from later activity or residual from earlier. For instance, charred material may have been 'stored', either in a former soil or an above ground pile (or midden) for some considerable time before entering a context selected for dating.

The majority of the 18 contexts sampled for palaeobotanical material contained minute amounts of charcoal and charred seeds or were sterile (see Appendix F). Only two contexts (08 and 06),

the fills of pits 09 and 07, produced moderately large amounts of charcoal. The features associated with the potentially regionally significant oval structure did, however, contain small amounts of charred grain and a seed from a species (sun spurge) that is thought to have been very rare in Britain before the Middle Ages.

Based on the available material and the significance of the oval structure, samples were chosen from context 08 (pit 09), the ring-gully, posthole 53 and pit 99. Charred grain and the sun spurge seed were chosen as this material is short-lived. However, due to the small amounts of grain in these contexts, the chance that some were intrusive or residual from earlier activity was noted as moderately high. Hence, low quality orders (see Table G2) have been attached to the radiocarbon dating results and their measured ages only broadly date the activity associated with the contexts.

Table G2: sample details

Context	Context description	All finds from context	Material chosen	Quality order (1-4)*
8	Fill of oval pit 9	Charcoal (164g): *maloidese*, *fraxinus*, *betula*, *alnus/corylus*, *ilex*, *prunus*. Charred grain: *Triticum* (2), indet. (2)	Wheat grain, then prunus charcoal	2
54	Fill of post-pipe in posthole 53	Charcoal (2.4g): *corylus*, *betula*. Charred grain/seeds: *hordeum* (2), *poaceae*, *hordeum* chaff (1), *carex*. Flint fake (1)	barley grain	3
89	Fill of ring gully 65, segment	Charred grain/seeds: *poaceae*, *avena* (1). Large mammal long bone fragment (1.2g)	Oat grain	3
92	Fill of ring gully 65, segment 6	Charcoal (0.1g): undetermined hardwood. Charred grain: *hordeum* (1), *Triticum* (1)	Wheat grain	3
100	Fill of central pit 99 surrounded by oval gully 65	*Euphorbia helloscopia* (1), *Poaceae*	Sun spurge seed	3

* Quality order: 1=very good; 4=very poor

Bayesian modelling

Two of the measured radiocarbon dates from the oval structure were tested using Bayesian chronological modelling (Naylor and Smith 1988; Bayliss 2009; Whittle *et al*. 2011, 19-59; Bayliss 2015). This allowed the combination of the dates with archaeological data ('prior information') such as stratigraphical relationships using a formal statistical methodology. This modelling also allowed the calculation of statistical probabilities of the '**Span**' of certain events to investigate the speed and, hence, the nature of deposition.

It should be noted, however, that the low number of radiocarbon determinations available potentially restricted the accuracy of the model tested. Furthermore, the measured dates were likely only broad indications of a terminus post quem (TPQ) for deposition. Both of these factors must be taken into account during interpretation of the results.

The model was produced within the OxCal online facility (OxCal v4.3.2; Bronk Ramsey 2017) using the '**Phase**' model. The '**Span**' query was also used to calculate a probabilistic range of activity.

RESULTS

The wheat grain from context 08 failed and a sample of *prunus* charcoal was sent as a replacement. Of the other dated samples, two retuned dates unlikely to be contemporary with the features that produced the material. The sun spurge seed from pit 99 returned a post 1950 date and was therefore probably intrusive. Similarly, the oat grain from context 89 was dated to the medieval period (13th-14th century) and was probably intrusive from the furrow that cut the ring-gully. This date does, however, provide supporting evidence for a medieval date for the furrows.

Pit 09

Although no artefacts were recovered from this feature, it had slightly heat-affected sides and contained burnt stone fragments, charcoal and charred grain. Based on its form, location and association, the excavator suggested that this feature (and the other isolated pits) could have represented early prehistoric activity.

The *prunus* charcoal (SUERC-84957) sent as a replacement for the failed wheat grain returned a date range of c. 1874-1664 calBC (at a probability of 95.4%). This date is considered to be a moderately accurate measurement of the date of pit 09, placing its infilling to the Early Bronze Age.

However, it should be remembered that this single measurement represents a small sample of the charcoal within the pit.

The oval structure

The oval ring-gully and associated postholes and pits represented an unusual structure of potentially a later prehistoric date.

As detailed above, the available material produced by the contexts associated with the structure was limited to small amounts of charcoal and charred grain and seeds. Due to the importance of unenclosed roundhouses, with respect to understanding the chronological development of settlement and landscape use during later prehistory (Petts and Gerrard 2006, 37-8), it was decided to pursue dating evidence for this group of features.

To mitigate the poor suitability of the available material, four samples, chosen from a variety of associated contexts that produced greater amounts of charcoal, across the area of the group, were submitted. In this way, although some of the returned dates would inevitably be from residual or intrusive material, the weight of evidence should relate more closely to the occupation of the roundhouse (Aitken 1990, 95-6). Two samples were chosen from the ring-gully, one from posthole 53 and one from pit 99. These dates were also designed to test the antiquity of the sun spurge as well as the wheat, oat and barley grains recovered.

The dates measured from the sun spurge seed and oat grain suggested that these were both intrusive from later activity. The remaining two dates measured from wheat and barley grains returned Iron Age dates and were considered (on the weight of evidence) to be representative of activity associated with the structure.

These two radiocarbon measurements (SUERC-84360 and SUERC-84362) were modelled (Fig. G1) using the '**Phase**' function (Table G3).

Table G3: Bayesian modelling data for the oval structure

Am=102.5; Ao=102.5	**Unmodelled (BC/AD)**						**Modelled (BC/AD)**							
	from	**to**	**%**	**from**	**to**	**%**	**from**	**to**	**%**	**from**	**to**	**%**	**A**	**C**
Sequence														
Boundary Start 1							-230	-60	68.2	-820	-50	95.4		96.5
Phase 1														
R_Date SUERC-84360	-163	-57	68.2	-180	-46	95.4	-150	-55	68.2	-175	-45	95.4	102.3	99.2
R_Date SUERC-84362	-148	-47	68.2	-168	-41	95.4	-150	-55	68.2	-170	-40	95.4	101.3	99.1
Boundary End 1							-145	25	68.2	-165	515	95.4		96.5
Span structure							0	250	68.2	0	935	95.4		97.6

A=individual agreement indices; C=convergence test; Am=A (model); Ao=A (overall)

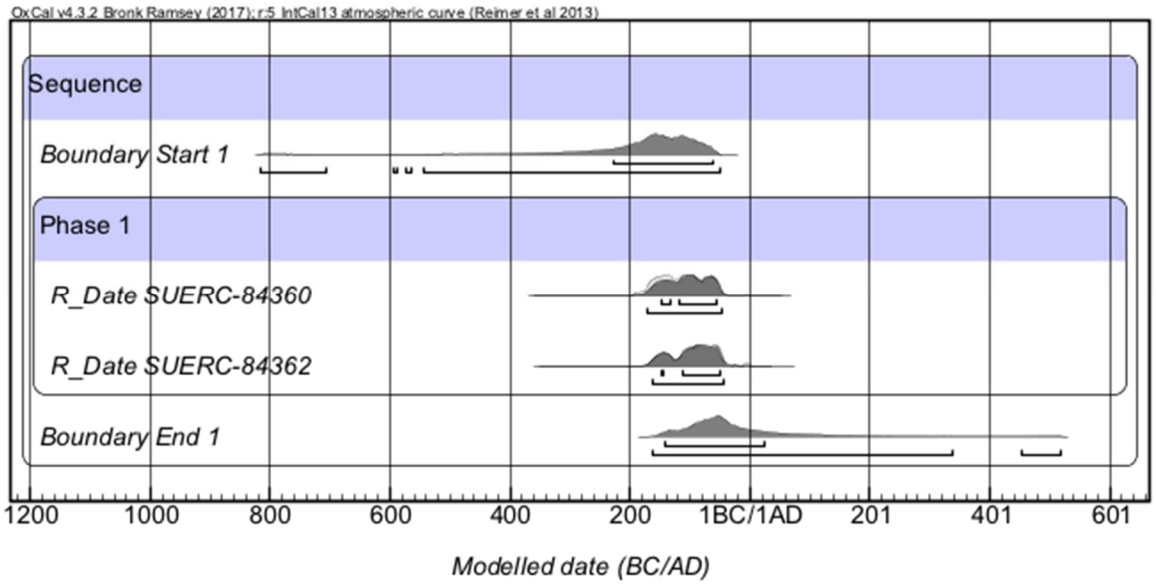


Figure G1: Probability distributions of dates for the oval structure as a Phase

This model had good overall agreement (Amodel=102.5 and Aoverall=102.5) and produced a statistical '**Span**' of activity of between *0* and *935* years (*95.4% probability*) or between *0* and *250* years (*68.2% probability*). This suggests that the charred grain could have 'died' in the same year. This was tested using the '**R-Combine**' function (see below).

The posterior density estimates for the start of this activity was *820-50 cal BC* (*95.4% probability*) or *230-60 cal BC* (*68.2% probability*), or likely within the Middle to Late Iron Age. The modelled estimate for the end of activity was potentially within the Middle to Late Iron Age at *165 calBC-calAD 515* (*95.4% probability*), or *145cal BC-calAD 25* (*68.2% probability*).

This model indicates that the activity that produced the charcoal was probably undertaken during the Middle to Late Iron Age. The small number of dates as well as the moderate chance of residuality means that this modelling should be considered as tentative.

Combining the Iron Age dates

The '**R_combine**' test indicated that the two dates were statistically consistent via a chi-square test (df=1 T'=0.4 (T'(5%) 3.8)), suggesting that they could have died (and been deposited) during the same year.

Table G4: Bayesian modelling data for pit 95 as a single date

	Unmodelled (BC/AD)					
	from	**to**	**%**	**from**	**to**	**%**
R_Combine Oval structure	-149	-53	68.2	-166	-47	95.4

This again indicated that the activity that produced the charred grain was probably undertaken during the Middle or Late Iron Age and possibly over a very short period of time. The two dates, however, represented a small sample of the theoretical nearby activity that produced the charred grain. Therefore, these two dates may only provide a broad measure of the span of the infilling of the features. The measured dates are, however, considered a reasonably reliable (broad) date for the charring of grain, and by inference, the use of the structure.

CONCLUSION

In general, the radiocarbon dating and the limited Bayesian modelling was successful in refining the chronologies of the recorded features. Furthermore, the modelling has provided some information regarding the span of activity associated with the oval structure and has confirmed activity on the site during the Early Bronze Age, the Middle or Late Iron age and the medieval period.

However, due to the potential residuality of some of the samples in combination with the small numbers of measured dates, the modelling, and the chronology of the unmodelled results, should be taken as tentative.

REFERENCES

Aitken, M. J. (1990) *Science-based Dating in Archaeology*. London and New York: Longman.

Ashmore, P. J. (1999) Radiocarbon dating: avoiding errors by avoiding mixed samples. *Antiquity* **73**, 124-30.

Bayliss, A. (1998) 'Some thoughts on using scientific dating in English archaeology and building analysis for the next decade,' in J. Bayley (ed.) *Science in Archaeology: an Agenda for the Future*. London: Historic England.

Bayliss, A. (2009) Rolling Out Revolution: Using Radiocarbon Dating in Archaeology. *Radiocarbon* **51**(1), 123-47.

Bayliss, A. (2015) 'Quality in Bayesian chronological models in archaeology.' *World Archaeology*, **47**:4, 677-700.

Bayliss, A., van der Plicht, J., Bronk Ramsey, C., McCormac, G., Healy, F. and Whittle, A. (2011) 'Towards generational time-scales: the quantitative interpretation of archaeological chronologies.' In A. Whittle, F. Healy and A. Bayliss (eds), 17-59.

Blinkhorn, E. and Milner, N. (2014). *Mesolithic Research and Conservation Framework*. York: Council for British Archaeology.

Brennand, M. (2007) *The Archaeology of North West England: Research and Archaeology in North West England: An Archaeological Research Framework for North West England Volume 2, Research Agenda and Strategy*. Archaeology North West Volume 9 issue 17. Council of British Archaeology North West.

Bronk Ramsey, C. (1995) Radiocarbon calibration and analysis of stratigraphy: The OxCal program. *Radiocarbon*, **37**(2), 425-30.

Bronk Ramsey, C. (2009) Bayesian analysis of radiocarbon dates. *Radiocarbon*, **51**(1), 337-60.

Bronk Ramsey, C. (2017) OxCal version 4.3.2; r5 [online]. Available at: https://c14.arch.ox.ac.uk/oxcal/OxCal.html (Accessed on 24.4.19).

Chadwick, A. M. (2009) *The Iron Age and Romano-British Periods in West Yorkshire. Research Agenda*. Wakefield: The West Yorkshire Archaeology Advisory Service.

English Heritage (2010) *Research Strategy for Prehistory*, (consultation draft).

Gibson, A. and Bayliss, A. (2009) Recent Research at Duggleby Howe, North Yorkshire. *The Archaeological Journal* **166**, 50-59.

Gillespie, R. (1984) *Radiocarbon User's Handbook*. Oxford University Committee for Archaeology.

Haselgrove, C., Armit, I., Champion, T., Creighton, J., Gwilt, A., Hill, J. D., Hunter, F. and Woodward, A. (2001) *Understanding the British Iron Age: An Agenda for Action*. Trust for Wessex Archaeology.

Manby, T. G., King, A. and Vyner, B. E. (2003) 'The Neolithic and Bronze Ages: a time of early agriculture' in Manby T. G., Moorhouse S. and Ottaway P. (eds.) *The Archaeology of Yorkshire: An assessment at the beginning of the 21st century*. Yorkshire Archaeological Society Occasional Paper No. 3, 35-113.

Naylor, J. C., and A. F. M. Smith (1988) An Archaeological Inference Problem. *Journal of American Statistical Association* **83**, 588-95.

Petts, D. and Gerrard, C. (2006) *Shared Visions: The North-East Regional Research Framework for the Historic Environment*. Durham: Durham County Council.

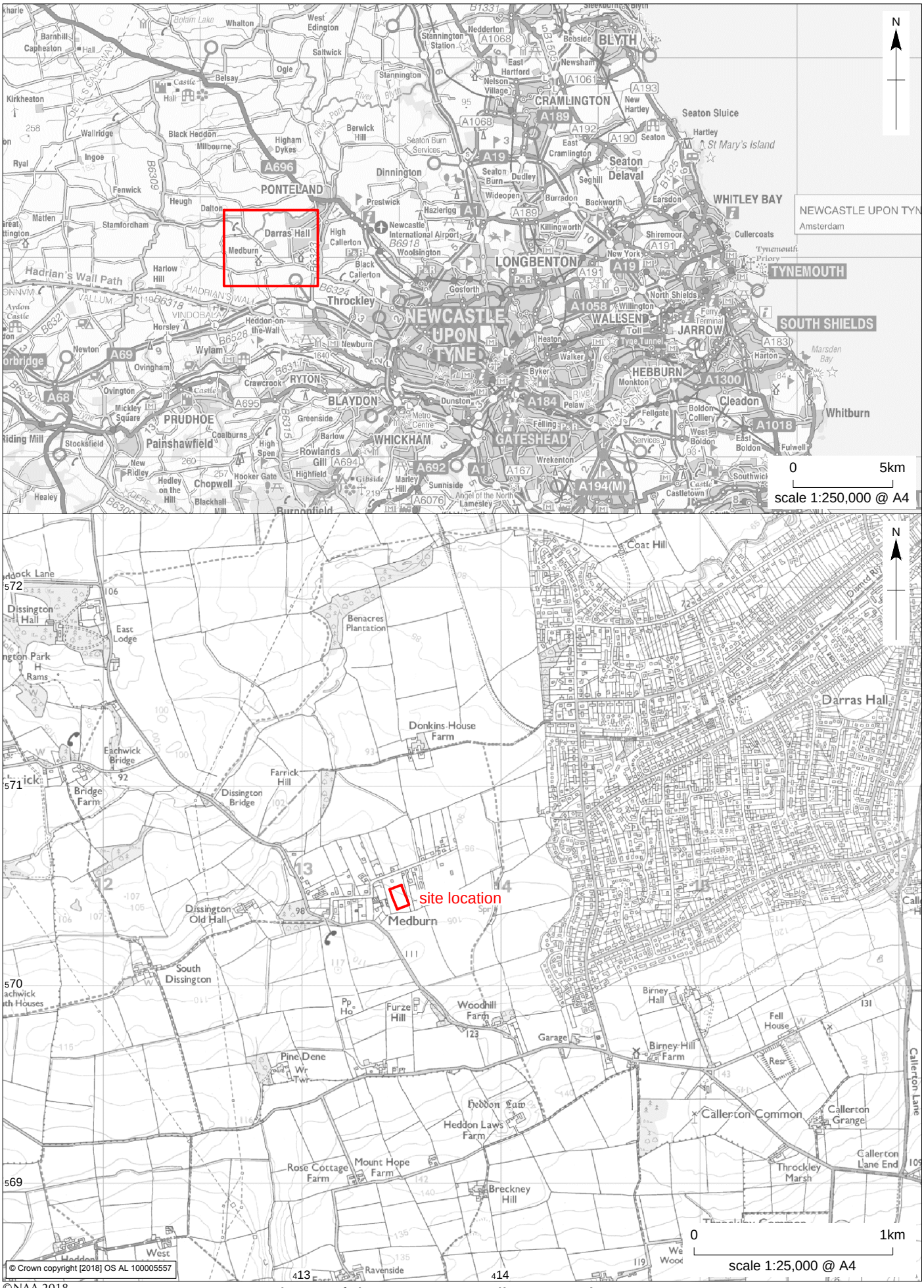
Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Grootes, P. M., Guilderson, T. P., Haflidason, H., Hajdas, I., HattŽ, C., Heaton, T. J., Hoffmann, D. L., Hogg, A. G., Hughen, K. A., Kaiser, K. F., Kromer, B., Manning, S. W., Niu, M., Reimer, R. W., Richards, D. A., Scott, E. M., Southon, J. R., Staff, R. A., Turney, C. S. M., & van der Plicht, J. (2013) IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0-50,000 Years cal BP. *Radiocarbon*, **55**(4).

Spikins, P. (2010) *Palaeolithic and Mesolithic Research Agenda for West Yorkshire*. Wakefield: The West Yorkshire Archaeology Advisory Service.

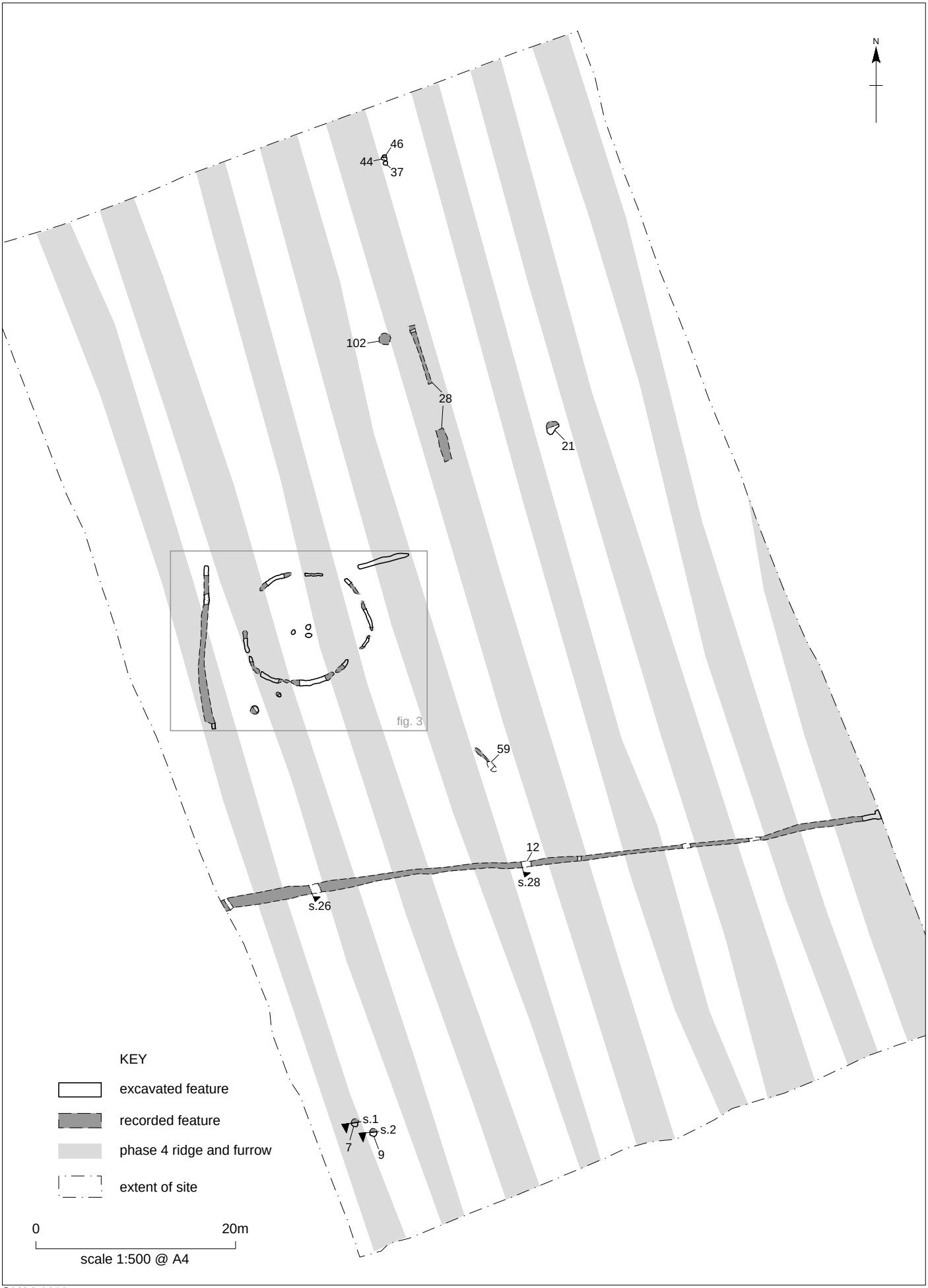
Vyner, B. (2008) *The Neolithic, Bronze Age and Iron Age in West Yorkshire*. Wakefield: The West Yorkshire Archaeology Advisory Service.

Waterbolk, H. T. (1971) Working with Radiocarbon dates. *Proceedings of the Prehistoric Society* **37**, 15-33.

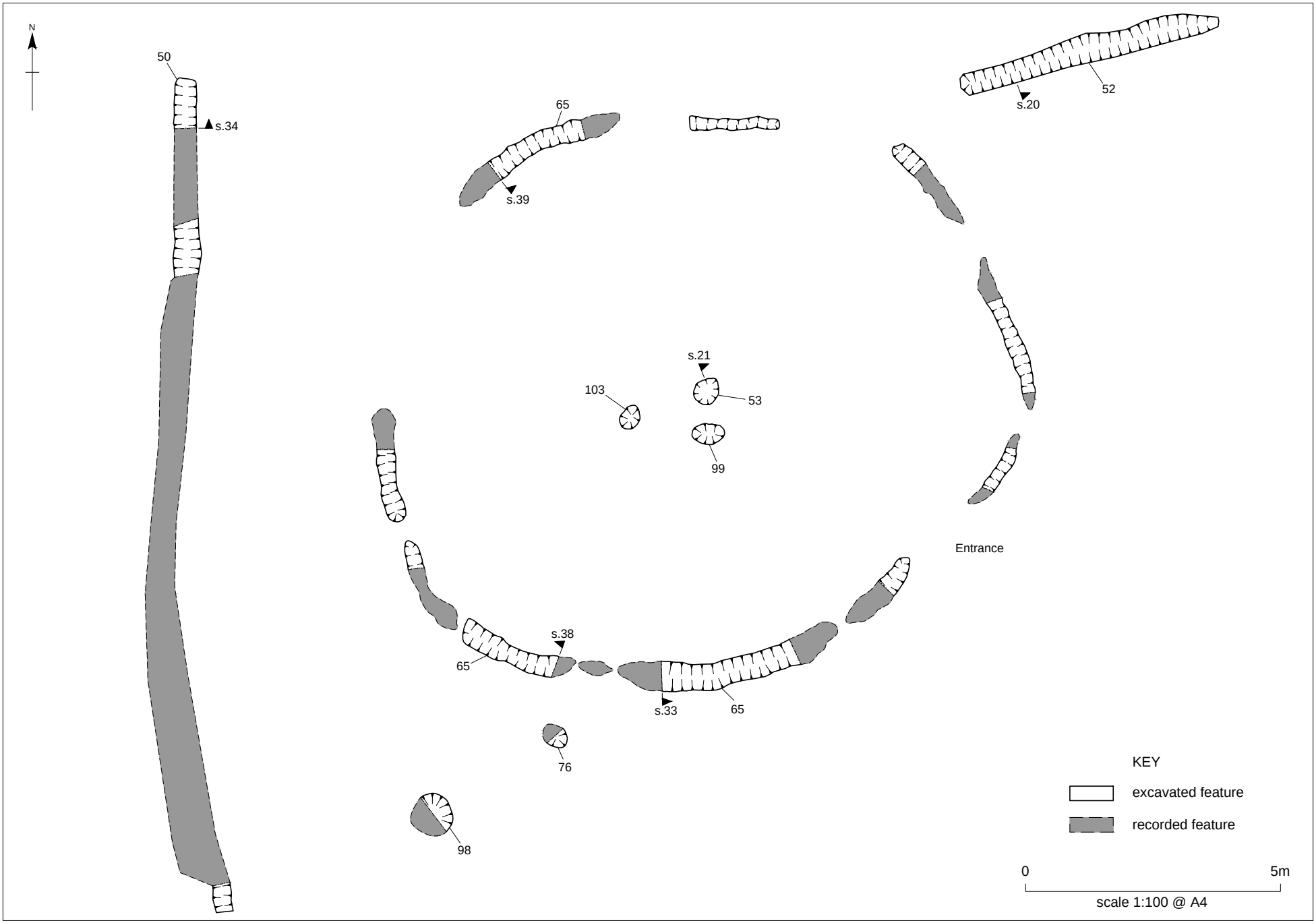
Whittle, A., Healy, F. and Bayliss, A. (2011) *Gathering Time: Dating the Early Neolithic Enclosures of Southern Britain and Ireland*. Oxford and Oakville: Oxbow Books.



Land East of the Nursery, Medburn: site location *Figure 1*

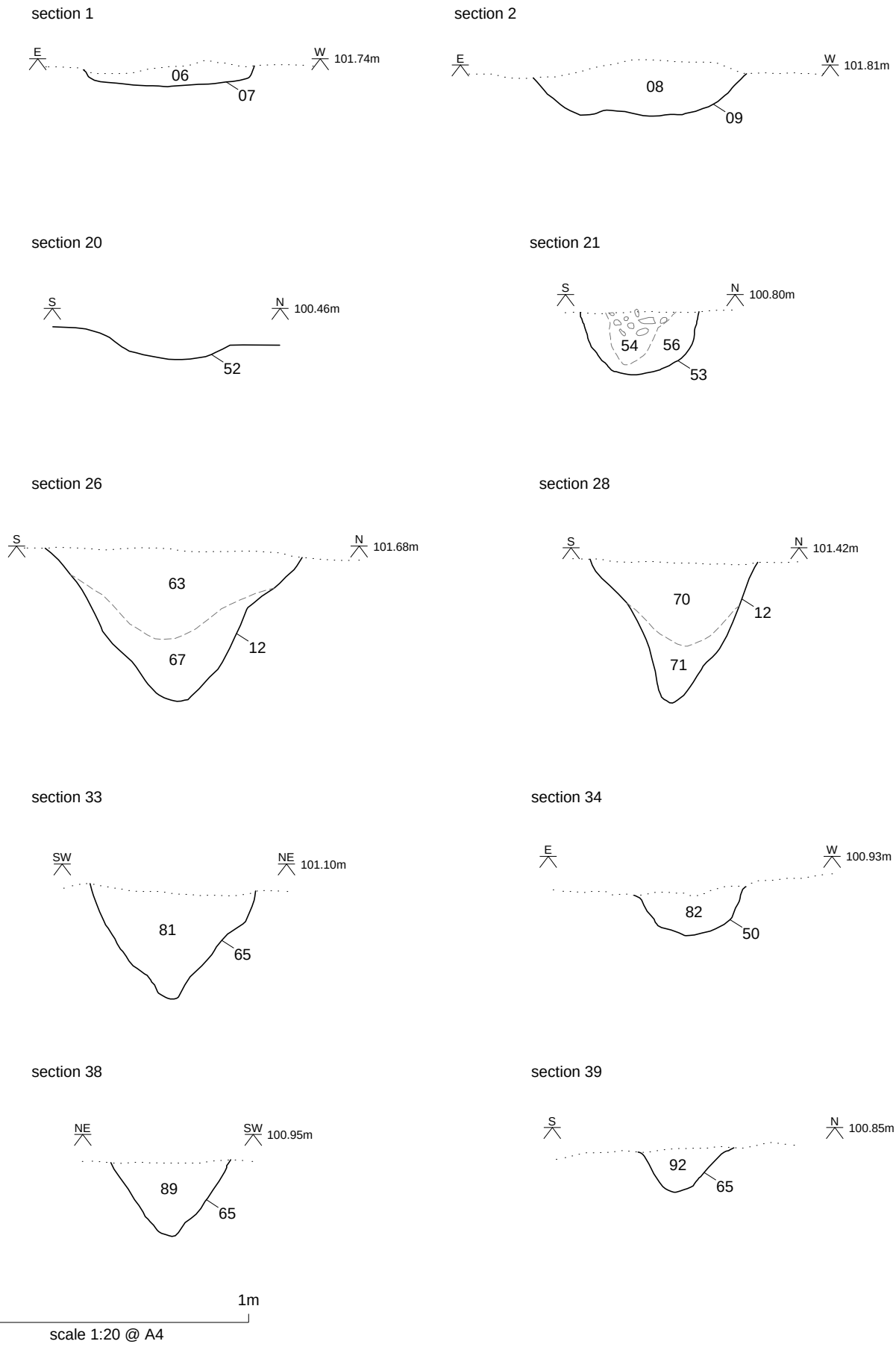


Land East of the Nursery, Medburn: recorded features *Figure 2*



Land East of the Nursery, Medburn: detailed plan

Figure 3



Land East of the Nursery, Medburn: sections of excavated features *Figure 4*