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Technical Report: Biological remains from a site at Low Farm, near Cottingham, East Riding of Yorkshire (site code: TSEP418)

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Summary

Twelve sediment samples and a small quantity of hand-collected bone from deposits of prehistoric to Romano-British date, revealed by excavations at Low Farm, north of Cottingham, were initially examined during an evaluation of their bioarchaeological potential.

One of the sediment samples, from the fill of a large pit, gave modest assemblages of both plant and invertebrate remains and a further subsample was subsequently examined. Radiocarbon dating (by AMS) of some plant remains recovered from this context was also undertaken, and the date obtained was for the early Bronze Age. The plant and invertebrate remains indicated aquatic deposition in the pit, though it did not necessarily always hold water. The immediate surroundings were swampy, but there was much evidence for a wider landscape dominated by agriculture, perhaps primarily pastoral.

The vertebrate remains were of no interpretative value.

Keywords: LOW FARM; COTTINGHAM; EAST RIDING OF YORKSHIRE; BRONZE AGE; ROMANO-BRITISH; PLANT REMAINS; INSECTS; VERTEBRATE REMAINS

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Introduction and methods

Twelve sediment samples ('GBA'/'BS' *sensu* Dobney *et al*. 1992), and a small quantity of hand-collected bone, were recovered from the deposits (from a total of seven trenches).

Sediment samples

The sediment samples were inspected in the laboratory. Four of the samples were selected for investigation and their lithologies were recorded, using a standard *pro forma*, prior to processing, following the procedures of Kenward *et al*. (1980; 1986), for recovery of plant and invertebrate macrofossils. The flots, washovers and residues were examined for plant remains. The flots and washovers were also examined for invertebrate remains, and the residues were examined for other biological and artefactual remains.

Plant remains (and other components of the residues) were recorded using a semi-quantitative scale from 1 (one to five individuals per kg of sample, or one or a few fragments of material which could not easily be counted) to 4 (many hundreds of individuals per kg, or a major component of the sample). Adult beetles and bugs were recorded at the 'detailed' level of Kenward (1992), and other invertebrates were recorded using a semi-quantitative scale of 1, 2, 3, 'several' (translated as 6), 'many' (15), with estimates for very large numbers. Quality of preservation was recorded using the scales of Kenward and Large (1998). In summary, preservation is recorded as chemical erosion (E) and fragmentation (F), in each case on a scale from 0.5 (superb) to 5.5 (extremely decayed or fragmented). Plant data were recorded directly into a database using *Paradox* software and insect data recorded on a *pro forma* and subsequently transferred to *Paradox* tables.

The principal sources for beetle ecology were

Sediment samples

Friday (1988), Hansen (1987), Koch (1989-92), and for bugs, Southwood and Leston (1959) and the Royal Entomological Society handbooks.

Table 1 shows a list of the processed samples and notes on their treatment.

Vertebrate remains

Data for the vertebrate remains were recorded electronically directly into a series of tables using a purpose-built input system and *Paradox* software. For each context (or sample) subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Additionally, where more than ten fragments were present, semi-quantitative information was recorded concerning fragment size, dog gnawing, burning, butchery and fresh breakage.

Where possible, fragments were identified to species or species group, using the reference collection at the EAU. Fragments not identifiable to species ('B' bones *sensu* Dobney *et al.* forthcoming) were grouped into categories: large mammal (assumed to be cattle, horse or large cervid); medium-sized mammal 1 (assumed to be caprovid, pig or small cervid); small mammal (rats, mice, voles etc); unidentified fish; unidentified bird; and completely unidentifiable.

Results

A complete list of remains recorded is given in Table 2 and individual lists for plant remains and other components of residues and washovers from the sediment samples, recorded during analysis of plant material, in Table 3. Tables 4 and 5 provide data concerning invertebrate remains, and details of the vertebrates are given in Table 7.

The results are presented in context number order. Archaeological information, provided by the excavator, is presented in square brackets.

Context 2014 [one of the higher fills of ?Romano-British pit 2015]
Sample 10/T (2 kg sieved to 300 microns with washover)

Dry, very dark brown, brittle to crumbly and slightly indurated (working unconsolidated then slightly sticky when wet), sandy amorphous organic sediment/humic sand. Very small fragments of flint (2 to 6 mm) were present in the sample.

The small to moderate-sized residue of about 100 cm^3 comprised sand and a little flint gravel. The small washover consisted of a few cm^3 of charcoal, not all of which was fully charred, and a little very decayed wood. In places the part-charred wood was soft and more or less translucent, permitting some small (<1 mm) fragments to be identified from the anatomical characters visible on a microscope slide as birch (*Betula*). The few other identifiable plant remains were a mixture of weeds and wetland plants but in numbers of taxa and of remains too small to be interpretatively useful. Only scraps of very decayed and fragmented insect cuticle were present.

Context 2021 [primary fill of large pit 2015 (?used for water collection); AMS dated to early Bronze Age]
Sample 7/T (2 kg sieved to 300 microns with paraffin flotation)

Moist, mid brown to dark purplish brown (mottled on mm- and cm-scale, colour varying with organic content), slightly crumbly (working plastic and slightly sticky), very slightly sandy clay silt with some voids. Stones (2 to 60 mm of chalk and flint) and fragments of very decayed wood were present in the sample.

The small residue of about 100 cm^3 was mostly sand and gravel. The small washover was of plant detritus, mainly abundant seeds of stinging nettle (*Urtica dioica*) with moderate numbers of elder (*Sambucus nigra*) and grass (Gramineae). The same taxa were found in the small flot. Other plant remains included a modest range of taxa likely to be found in marsh or riverside habitats, probably in an area with some disturbance by man or livestock. (For a discussion of the invertebrate remains from this subsample, see below.)

A single fragment of medium-sized mammal bone was recovered from this sample.

Sample 7/T2 (5 kg)

This additional subsample was initially used to extract plant remains for AMS dating (see below). It was then subjected to paraffin flotation and the plant and invertebrate remains recorded.

There was a moderate-sized residue of about 250 cm^3 of which barely 50 cm^3 formed a washover of woody and herbaceous detritus, the rest being sand and gravel (to 50 mm). As in the assessment subsample, the most abundant identifiable remains were 'seeds' of stinging nettle, with moderate numbers of seeds of toad rush (*Juncus bufonius*), duckweed (*Lemna*) and elder, and a small range of other taxa including some annual weeds of disturbed (?cultivated) ground. Traces of a fungal fruiting body (perithecium) of *Rosellinia* cf. *mammiformis* must have originated on tree bark.

The flot was quite small and about half consisted of fragments of invertebrate cuticle, mostly beetles. These fossils were mostly highly fragmented and had lost their resilience, falling apart very easily when manipulated, even when using a fine paintbrush. Many were visibly strongly decayed, having lost colour, sometimes patchily, and a significant proportion were too rotted or fragmented to be readily identified (E 3.0-5.5, mode 4.0 weak; F 2.5-5.5, mode 4.0 weak; trend to pale, range 1-4, mode 4 distinct). The number of adult beetles and bugs recorded was 108 individuals of 72 taxa, though remains of substantially more were probably present but unrecordable.

seems certain. The most abundant beetle was *Ochthebius minimus* (11 individuals), and most of the more abundant species were aquatics too: a

Helophorus species (5), a hydroporine, *Hydrobius fuscipes*, and *Tanysphyrus lemnae* (all 3; the last associated with duckweeds, *Lemna*). These records suggest shallow water, not too polluted and not necessarily permanent. Much of the rest of the fauna may have lived in a rather damp area with herbaceous vegetation and a range of dryish to damp litter, species such as *Olophrum* ?*piceum*, the shieldbug *Picromerus bidens*, *Dyschirius* ?*globosus*, *Anthobium* sp., and *Cyphon* sp. being very likely to be found together in swampy conditions, and many others being typical of plant debris.

A few species are likely to represent conditions further afield. A few dung beetles were present: single individuals of three *Aphodius* species and of *Onthophagus joannae* (representing the true dung beetles), and a few taxa often found in dung but frequently in other habitats (e.g. *Oxyomus sylvestris* and *Sphaeridium* sp.). *Megsternum obscurum*, the second most abundant beetle in the assemblage with nine individuals, is commonly found in dung but occurs in a range of other habitats too. There may have been dung - presumably in grazing land - nearby, but the numbers of beetles are too small for certainty. Two *Phyllopertha horticola* suggest poor grassland.

One species associated with dead wood was recorded: the flatbug *Aneurus* sp. There were no species strongly suggestive of human structures or artificial accumulations of decaying matter.

AMS dating: Sambucus *and* Rubus idaeus *and* R. fruticosus *seeds*
3300±50 BP (Cal BC 1690 to 1450 (Cal BP 3640 to 3400) Beta –161365)

Context 7013 [fill of ditch re-cut (7014), 2nd century AD]
Sample 1/T (3 kg sieved to 300 microns with paraffin flotation)

Moist, dark brown, crumbly to unconsolidated, humic sand with some stones (6 to 20 mm, flint and quartz or quartzite) present.

The moderately large residue of about 350 cm^3 comprised sand and flint gravel (to 40 mm), with some small (<5 mm) fragments of iron-rich concreted material which may have been iron pan, and a trace of pottery (to 25 mm). The small washover and flot from this subsample gave modest numbers of stonewort (Characeae) oogonia—this calcareous green alga is most characteristic of newly-formed ponds and lakes—but otherwise there were only traces of elder and of hemp agrimony (*Eupatorium cannabinum*) of no interpretative value in isolation.

Context 7015 ['peaty' deposit found under Roman ditch features but not found in other sections excavated to the same depth elsewhere on the site: ?fill of ditch or waterlogged hollow]
Sample 3/T (2 kg sieved to 300 microns with washover)

Moist, black, crumbly (working soft and just plastic when wet), silty amorphous organic sediment with some small stones (6 to 20 mm) present.

The moderate-sized residue of about 150 cm^3 was mainly sand with a little flint gravel. The small washover consisted of a few cm^3 of charcoal, with moderate numbers of Characeae oogonia and traces of elder and blackberry (*Rubus fruticosus* agg.) seeds, the oogonia probably indicating a deposit forming in standing water (or including sediment such as marl reworked from such a deposit). The few invertebrate remains were of no interpretative value and a large subsample would not appreciably improve matters.

Vertebrate remains

Six contexts from three of the seven trenches produced a total of 60 fragments, none of which were measurable or able to provide age-at-death information based on tooth wear.

Preservation of the bones was fairly poor, with much of the material being eroded and with very rounded edges. Bird bones from Context 7002 showed moderately better preservation, but the bones were quite fragile and the broken edges on some of the elements appeared to 'curl' rather like heat-damaged paper.

Just over half of the bones (33) were recovered from a single context (7002) and represented an incomplete bird skeleton. These remains were identified as a member of the Laridae (gull) family. Morphologically the bones resembled those of modern black-headed gull (*Larus ridibundus* L.) and kittiwake (*L. tridactylus* L.) reference specimens, although the latter was somewhat larger than the archaeological specimen. The remaining bones recovered from this site were mostly too poorly preserved to be identified to species, but a few cattle maxillary molars (Contexts 2003 and 2014) and a fragment of horse pelvis (Context 1009) were noted.

A summary of the hand-collected vertebrate remains is presented in Table 4; they did not warrant further analysis.

Discussion

Three of the four sediment samples examined yielded only rather few biological remains. The fourth, from the fill of a large pit (Context 2021) yielded quite large numbers of remains, though preservation was rather variable. They pointed to aquatic deposition (though not necessarily in permanent water) in a landscape which was dominated by human activity, presumably through agriculture, and probably including grazing, but with no evidence for arable cultivation.

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Table 1. List of processed sediment samples from excavations at Low Farm, near Cottingham (TSEP 418), with notes on their treatment.

Context	Sample	Notes
2014	10	2 kg sieved to 300 microns with washover
2021	7	2 kg sieved to 300 microns with paraffin flotation, with a further subsample of 5 kg sieved to 300 microns with paraffin flotation after extraction of plant remains for AMS dating
7013	1	3 kg sieved to 300 microns with paraffin flotation
7015	3	2 kg sieved to 300 microns with washover

Table 2. Complete list of taxa recorded from deposits at Low Farm, near Cottingham (TSEP 418). Nomenclature and taxonomy for plant remains follow Tutin et al. (1964-80) and Kloet and Hincks (1964-77) for insects.

Tentative records for insects are not included if secure ones were also made. Plant material not specifically noted as being preserved by charring or mineral replacement can be taken to be uncharred and unmineralised (i.e. 'waterlogged', but sometimes denoted simply as 'uncharred'). For invertebrates (all preserved by anoxic waterlogging), * = not used in calculating assemblage statistics (Table 5); ecode—ecological code used in generating main statistics; Sp(p).—species not previously listed; Sp(p). indet.—may be a species already listed.

Taxon	**Vernacular name**	**Remains recorded**
Alnus glutinosa (L.) Gaertner	alder	charcoal fragment(s)
Urtica dioica L.	stinging nettle	achene(s)
Rumex sp(p).		docks fruit(s)
Chenopodium Section *Pseudoblitum*	red goosefoot etc.	seed(s)
Chenopodium album L.	fat hen	seed(s)
Atriplex sp(p).	oraches	seed(s)
Stellaria sp(p).	stitchworts/chickweeds	seed(s)
Ranunculus sceleratus L.	celery-leaved crowfoot	achene(s)
Rubus idaeus L.	raspberry	seed(s)
R. fruticosus agg.	blackberry/bramble	seed(s)
Aethusa cynapium L.	fool's parsley	mericarp(s) and mericarp fragments
Galium aparine L.	goosegrass, cleavers	epicarp (fruit skin)
Lamium Section *Lamiopsis*	annual dead-nettles	nutlet(s)
Stachys sp(p).	woundworts	nutlet(s)
Lycopus europaeus L.	gipsywort	nutlet(s)
Mentha sp(p).	mints	nutlet(s)
Plantago major L.	greater plantain	seed(s)
Sambucus nigra L.	elder	seed(s) and seed fragments
Eupatorium cannabinum L.	hemp agrimony	achene fragment(s)
Juncus inflexus L./J. *effusus* L./ *J. conglomeratus* L.	hard/soft/compact rush	seed(s)
J. cf. *compressus* Jacq.	?round-fruited rush	seed(s)
J. bufonius L.	toad rush	seed(s)
Gramineae	grasses	waterlogged caryopsis/es
Triticum sp(p).	wheats	charred caryopsis/es
Lemna sp(p).	duckweeds	seed(s)
Carex sp(p).	sedges	nutlet(s)
Characeae	(freshwater green algae)	oogonium/ia

CRUSTACEA		*Heteroptera sp. (nymph)	u
**Daphnia* sp. (ephippium)	oa-w	*Aphrodes bicinctus* (Schrank)	oa-p
*Cladocera sp. L (ephippium)	oa-w	Delphacidae sp.	oa-p
		*Psylloidea sp. (nymph)	oa-p
INSECTA			
HEMIPTERA		DIPTERA	
Aneurus sp.	l	*Bibionidae sp.	u
Picromerus bidens (Linnaeus)	oa-p		
Scolopostethus sp.	oa-p	COLEOPTERA	
Lygaeidae sp.	oa-p	*Dyschirius ?globosus* (Herbst)	oa
Anthocoris sp.	oa-p	*Trechus obtusus* or *quadristriatus*	oa
Corixidae sp.	oa-w	*Bembidion* sp.	oa
Agonum sp.	oa	Hydroporinae spp.	oa-w
Carabidae sp.	ob	*Agabus bipustulatus* (Linnaeus)	oa-w

Agabus sp.	oa-w
Helophorus spp.	oa-w
Sphaeridium sp.	rf
Cercyon analis (Paykull)	rt-sf
Cercyon spp.	u
Megasternum obscurum (Marsham)	rt
Hydrobius fuscipes (Linnaeus)	oa-w
Hydrophilinae sp.	oa-w
Onthophilus striatus (Forster)	rt-sf
Ochthebius minimus (Fabricius)	oa-w
Limnebius sp.	oa-w
?Nargus sp.	u
?Silpha atrata Linnaeus	u
Micropeplus staphylinoides (Marsham)	rt
Anthobium sp.	oa
Olophrum ?piceum (Gyllenhal)	oa
Omalium sp.	rt
Carpelimus sp.	u
Platystethus cornutus group	oa-d
Anotylus rugosus (Fabricius)	rt
Anotylus sculpturatus group	rt
Stenus spp.	u
Othius punctulatus (Goeze)	rt-st
Xantholinus glabratus (Gravenhorst)	rt
Staphylininae sp.	u
Tachyporus sp.	u
Tachinus sp.	u
Aleocharinae spp.	u
Aphodius spp.	ob-rf
Oxyomus sylvestris (Scopoli)	rt-sf
Onthophagus joannae Goljan	oa-rf
Phyllopertha horticola (Linnaeus)	oa-p
Cyphon sp.	oa-d
Elateridae sp.	ob
Brachypterus sp.	oa-p
Meligethes sp.	oa-p
Nitidulidae sp.	u
Atomaria sp.	rd
Enicmus sp.	rt-sf
Corticarina sp.	rt
Cortinicara gibbosa (Herbst)	rt
Chrysolina fastuosa (Scopoli)	oa-p
Crepidodera sp.	oa-p
Apion sp.	oa-p
Tanysphyrus lemnae (Paykull)	oa-w-p
Curculionidae spp.	oa
*Coleoptera sp. (larva)	u
HYMENOPTERA	
*Hymenoptera Parasitica sp.	u
*Chalcidoidea sp.	u
ARACHNIDA	
*Aranae sp.	u
*Acarina sp.	u
*?Egg mass indet.	u
MOLLUSCA	
Margaratifera/*Unio* sp.	
VERTEBRATA	
Larus spp.	
Equus f. domestic	
Bos f.domestic	
Indet. bone fragments	

Table 3. Complete lists of plant remains and other components of samples recorded during examination of plant material from Low Farm, near Cottingham (TSEP 418). Samples are presented in context and sample order and within each list components are listed by decreasing abundance, using a semi-quantitative four-point scale.

Abbreviations: ab─abscission; ch─charred; dec─decayed; fgts─fragments; inc─including; max─maximum dimension; spec─specimen; v─very; for twig fragments, measurements are length x diameter in mm.

Context 2014, Sample 10/T		
sand	2	
Atriplex sp(p).	1	
Eupatorium cannabinum	1	fgts only
Gramineae	1	
Juncus inflexus/effusus/ conglomeratus	1	
Plantago major	1	
Sambucus nigra	1	inc fgts
beetles	1	
charcoal	1	max 10 mm
earthworm egg caps	1	
flint gravel	1	max 30 mm
part-burnt wood	1	max 10 mm
wood fgts	1	v dec, max 5 mm
Context 2021, Sample 7/T		
Urtica dioica	3	
Gramineae	2	
Sambucus nigra	2	inc fgts
beetles	2	
gravel	2	max 50 mm
sand	2	
Aethusa cynapium	1	fgts only
Chenopodium Sect. Pseudoblitum	1	
Daphnia (ephippia)	1	
Galium aparine (epicarp)	1	
Juncus inflexus/effusus/ conglomeratus	1	
Lemna sp(p).	1	
Lycopus europaeus	1	
Mentha sp(p).	1	
Ranunculus sceleratus	1	
cf. Rosellinia sp(p).	1	
Rubus fruticosus agg.	1	
Rumex sp(p).	1	
Stellaria sp(p).	1	
bone fgts	1	max 35 mm
charcoal	1	max 15 mm
earthworm egg caps	1	
leaf ab pads	1	
mites	1	
Pre-Quaternary megaspores	1	
?iron pan fgts	2	max 5 mm
Eupatorium cannabinum	1	fgts only
wood fgts	1	v dec, max 10 mm
Context 2021, Sample 7/T2		
Urtica dioica	3	
gravel	3	max 50 mm
Juncus bufonius	2	
Lemna sp(p).	2	
Sambucus nigra	2	
earthworm egg caps	2	
sand	2	
Aethusa cynapium	1	
Alnus (charcoal)	1	max 10 mm
Carex sp(p).	1	
Chenopodium album	1	
Gramineae	1	
Heterodera (cysts)	1	
Juncus cf. compressus	1	
Juncus inflexus/effusus/ conglomeratus	1	
Lamium Section Lamiopsis	1	
Lycopus europaeus	1	
Pre-Quaternary megaspores	1	
Ranunculus sceleratus	1	
Rosellinia cf. mammiformis	1	
Rubus fruticosus agg.	1	
Rubus idaeus	1	
Stachys sp(p).	1	
Triticum sp(p).	1	single spec
bark fgts	1	max 10 mm
beetles	1	
charcoal	1	max 10 mm
flint	1	max 25 mm
fly puparia	1	
herbaceous detritus	1	
mites	1	
wood fgts	1	v dec, max 15 mm
Context 7013, Sample 1/T		
sand	3	
Characeae	2	
flint gravel	2	max 40 mm
gravel	2	max 40 mm
Sambucus nigra	1	
beetles	1	

charcoal	1	max 5 mm
earthworm egg caps	1	
pottery	1	max 25 mm
root/rootlet fgts (modern)	1	
twig fgts (ch)	1	max 10 mm

Context 7015, Sample 3/T

sand	3	
Characeae	2	
flint gravel	2	max 25 mm
Rubus fruticosus agg.	1	
Sambucus nigra	1	inc fgts
charcoal	1	max 5 mm
root/rootlet fgts	1	
unwashed sediment	1	max 5 mm

Table 4. Insects and other macro-invertebrates from Low Farm, near Cottingham (TSEP 418): species lists by sample. Taxa are listed in descending order of abundance.

Key: n - minimum number of individuals; q - quantification (s - semi-quantitative 'several', m - semi-quantitative 'many', both *sensu* Kenward *et al*. (1986), e - estimate); ecodes - ecological codes (see Table 6 for explanation); * - not used in calculation of statistics in Table 5.

Context: 2021 Sample: 7/T+T2 ReM: D
Weight: 7.00 E: 4.00 F: 4.00

Notes: Entered HK 20/3/02. Two dish flot, about half invertebrate fragments, mostly beetles. Recorded in flot and (mostly) on filter paper. Remains highly fragmented and fell apart very easily on handling; many too far decayed to name and others doubtless completely lost. E 3.0-5.5, mode 4.0 weak; F 2.5-5.5, mode 4.0 weak. Trend to pale, range 1-4, mode 4, distinct. Tube of named material tipped over and so may have lost or gained a few fossils: does not affect list.

	n	q	ecode
Ochthebius minimus	11	n	oa-w
Megasternum obscurum	9	n	rt
Helophorus sp. A	5	n	oa-w
Hydroporinae sp. A	3	n	oa-w
Hydrobius fuscipes	3	n	oa-w
Tanysphyrus lemnae	3	n	oa-w-p
Hydroporinae sp. B	2	n	oa-w
Limnebius sp.	2	n	oa-w
Micropeplus staphylinoides	2	n	rt
Olophrum ?piceum	2	n	oa
Omalium sp.	2	n	rt
Oxyomus sylvestris	2	n	rt-sf
Phyllopertha horticola	2	n	oa-p
Atomaria sp.	2	n	rd
Aneurus sp.	1	n	l
Picromerus bidens	1	n	oa-p
Scolopostethus sp.	1	n	oa-p
Lygaeidae sp.	1	n	oa-p
Anthocoris sp.	1	n	oa-p
Corixidae sp.	1	n	oa-w
Aphrodes bicinctus	1	n	oa-p
Delphacidae sp.	1	n	oa-p
Dyschirius ?globosus	1	n	oa
Trechus obtusus or quadristriatus	1	n	oa
Bembidion sp.	1	n	oa
Agonum sp.	1	n	oa
Carabidae sp.	1	n	ob
Hydroporinae sp. C	1	n	oa-w
Agabus bipustulatus	1	n	oa-w
Agabus sp.	1	n	oa-w
Helophorus sp. B	1	n	oa-w
*Bibionidae sp.	2	n	u
*Coleoptera sp. (larva)	2	n	u
Sphaeridium sp.	1	n	rf
Cercyon analis	1	n	rt-sf
Cercyon sp. A	1	n	u
Cercyon sp. B	1	n	u
Hydrophilinae sp.	1	n	oa-w
Onthophilus striatus	1	n	rt-sf
?Nargus sp.	1	n	u
?Silpha atrata	1	n	u
Anthobium sp.	1	n	oa
Carpelimus sp.	1	n	u
Platystethus cornutus group	1	n	oa-d
Anotylus rugosus	1	n	rt
Anotylus sculpturatus group	1	n	rt
Stenus sp. A	1	n	u
Stenus sp. B	1	n	u
Othius punctulatus	1	n	rt-st
Xantholinus glabratus	1	n	rt
Staphylininae sp.	1	n	u
Tachyporus sp.	1	n	u
Tachinus sp.	1	n	u
Aleocharinae sp. A	1	n	u
Aleocharinae sp. B	1	n	u
Aleocharinae sp. C	1	n	u
Aleocharinae sp. D	1	n	u
Aphodius sp. A	1	n	ob-rf
Aphodius sp. B	1	n	ob-rf
Aphodius sp. C	1	n	ob-rf
Onthophagus joannae	1	n	oa-rf
Cyphon sp.	1	n	oa-d
Elateridae sp.	1	n	ob
Brachypterus sp.	1	n	oa-p
Meligethes sp.	1	n	oa-p
Nitidulidae sp.	1	n	u
Enicmus sp.	1	n	rt-sf
Corticarina sp.	1	n	rt
Cortinicara gibbosa	1	n	rt
Chrysolina fastuosa	1	n	oa-p
Crepidodera sp.	1	n	oa-p
Apion sp.	1	n	oa-p
Curculionidae sp. A	1	n	oa
Curculionidae sp. B	1	n	oa
*Daphnia sp. (ephippium)	100	e	oa-w
*?Egg mass indet.	15	m	u
*Psylloidea sp. (nymph)	6	s	oa-p
*Acarina sp.	6	s	u
*Hymenoptera Parasitica sp.	2	n	u
*Aranae sp.	2	n	u

*Cladocera sp. L (ephippium)	1	n	oa-w
*Heteroptera sp. (nymph)	1	n	u
*Chalcidoidea sp.	1	n	u

Table 5: Main statistics for the assemblages of adult Coleoptera and Hemiptera (excluding Aphidoidea and Coccidoidea) from Low Farm (TSEP418). For explanation of codes see Table 6.

Context	2021
Sam ple	7
Ext	/T+T2
S	72
N	108
ALPHA	94
SEALPHA	18
SOB	41
PSOB	57
NOB	65
PNOB	60
ALPHAOB	48
SEALPHAOB	11
SW	13
PSW	18
NW	35
PNW	32
ALPHAW	8
SEALPHAW	2
SD	2
PSD	3
ND	2
PND	2
ALPHAD	0
SEALPHAD	0
SP	13
PSP	18
NP	16
PNP	15
ALPHAP	0
SEALPHAP	0
SM	0
PSM	0
NM	0
PNM	0
ALPHAM	0
SEALPHAM	0
SL	1
PSL	1
NL	1
PNL	1
ALPHAL	0
SEALPHAL	0
SRT	19
PSRT	26
NRT	31
PNRT	29
ALPHART	21
SEALPHART	7
SRD	1
PSRD	1
NRD	2
PNRD	2
ALPHARD	0
SEALPHARD	0
SRF	5
PSRF	7
NRF	5
PNRF	5
ALPHARF	0
SEALPHARF	0
SSA	5
PSSA	7
NSA	6
PNSA	6
ALPHASA	0
SEALPHASA	0
SSF	4
PSSF	6
NSF	5
PNSF	5
ALPHASF	0
SEALPHASF	0
SST	1
PSST	1
NST	1
PNST	1
ALPHAST	0
SEALPHAST	0
SSS	0
PSSS	0
NSS	0
PNSS	0
ALPHASS	0
SEALPHASS	0
SG	0
PSG	0
NG	0
PNG	0
ALPHAG	0
SEALPHAG	0

Table 6. Abbreviations for ecological codes and statistics used for interpretation of insect remains in text and tables. Lower case codes in parentheses are those assigned to taxa and used to calculate the group values (the codes in capitals).

See Table 2 for codes assigned to taxa from the present site. Alpha - the index of diversity alpha (Fisher *et al.* 1943); Indivs - individuals (based on MNI); No - number.

No taxa	S
Estimated number of indivs (MNI)	N
Index of diversity (´)	alpha
Standard error of alpha	SE alpha
No 'certain' outdoor taxa (oa)	SOA
Percentage of 'certain' outdoor taxa	PSOA
No 'certain' outdoor indivs	NOA
Percentage of 'certain' outdoor indivs	PNOA
No OA and probable outdoor taxa (oa+ob)	SOB
Percentage of OB taxa	PSOB
No OB indivs	NOB
Percentage OB indivs	PNOB
Index of diversity of the OB component	alphaOB
Standard error	SEalphaOB
No aquatic taxa (w)	SW
Percentage of aquatic taxa	PSW
No aquatic indivs	NW
Percentage of W indivs	PNW
Index of diversity of the W component	alphaW
Standard error	SEalphaW
No damp ground/waterside taxa (d)	SD
Percentage D taxa	PSD
No damp D indivs	ND
Percentage of D indivs	PND
Index of diversity of the D component	alphaD
Standard error	SEalphaD
No strongly plant-associated taxa (p)	SP
Percentage of P taxa	PSP
No strongly P indivs	NP
Percentage of P indivs	PNP
Index of diversity of the P component	alphaP
Standard error	SEalphaP
No heathland/moorland taxa (m)	SM
Percentage of M taxa	PSM
No M indivs	NM
Percentage of M indivs	PNM
Index of diversity of the M component	alphaM
Standard error	SEalphaM
No wood-associated taxa (l)	SL
Percentage of L taxa	PSL
No L indivs	NL
Percentage of L indivs	PNL
Index of diversity of the L component	alphaL
Standard error	SEalphaL
No indivs of grain pests (g)	NG
Percentage of indivs of grain pests	PNG
No decomposer taxa (rt + rd + rf)	SRT
Percentage of RT taxa	PSRT
No RT indivs	NRT
Percentage of RT indivs	PNRT
Index of diversity of RT component	alpha RT
Standard error	SEalphaRT
No 'dry' decomposer taxa (rd)	SRD
Percentage of RD taxa	PSRD
No RD indivs	NRD
Percentage of RD indivs	PNRD
Index of diversity of the RD component	alphaRD
Standard error	SEalphaRD
No 'foul' decomposer taxa (rf)	SRF
Percentage of RF taxa	PSRF
No RF indivs	NRF
Percentage of RF indivs	PNRF
Index of diversity of the RF component	alphaRF
Standard error	SEalphaRF
No synanthropic taxa (sf+st+ss)	SSA
Percentage of synanthropic taxa	PSSA
No synanthropic indivs	NSA
Percentage of SA indivs	PNSA
Index of diversity of SA component	ALPHASA
Standard error	SEALPHASA
No facultatively synanthropic taxa (sf)	SSF
Percentage of SF taxa	PSSF
No SF indivs	NSF
Percentage of SF indivs	PNSF
Index of diversity of SF component	ALPHASF
Standard error	SEALPHASF
No typical synanthropic taxa (st)	SST
Percentage of ST taxa	PSST
No ST indivs	NST
Percentage of ST indivs	PNST
Index of diversity of ST component	ALPHAST
Standard error	SEALPHAST
No strongly synanthropic taxa (ss)	SSS
Percentage of SS taxa	PSSS
No SS indivs	NSS
Percentage of SS indivs	PNSS
Index of diversity of SS component	ALPHASS
Standard error	SEALPHASS
No uncoded taxa (u)	SU
Percentage of uncoded indivs	PNU

Table 7. Summary of hand-collected vertebrate remains from excavations at Low Farm, near Cottingham (TSEP418).

Context	No. of fragments	Notes
1007	2	2 shaft fragments - freshly broken.
1009	1	Horse pelvis - eroded bone surface and rounded edges - fresh breakage. Possibly dog gnawed and may be some knife marks but remains tentative because of condition of bone.
2003	1	1 cow upper molar.
2007	13	One bone heavily fragmented during excavation. Very poorly preserved large-sized mammal metapodial.
2014	1	1 cow upper molar (M3).
7002	33	Most of remains represent single bird skeleton - closest to black-headed gull and kittiwake (although latter somewhat larger) - skull + mandible, humerus x 2, scapula x 1, carpometacarpal, coracoid x 2, femur x 2, ulna, sternum, vertebra, rib x 2, fibula, tibiotarsus, pelvis, furcula. Mammal remains included large and medium-sized mammal shaft fragments and a number of unidentified fragments.
7013	8	Large-sized mammal mandible and ?shaft fragments - preservation very poor. Much fresh breakage in evidence.
7021	1	1 burnt shaft fragment.