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Palaeoenvironmental assessment of deposits from the River Gipping floodplain, Stowmarket Relief Road, Suffolk

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Non-technical summary

This report describes the analyses of sediment samples recovered from peat deposits c. 4.5m deep from a borehole excavated on the line of the Stowmarket relief road. Sub-fossil pollen, plant and beetle remains have been extracted from the peat whilst three samples of sediment (near top, middle and base) have been dated using the radiocarbon method. These dates show that sediment accumulation began, probably within a former infilling river channel of the Gipping, close to 9 000 years before the present. The continuing accumulation of peat in the wet environment of a floodplain is apparent until around 1300 years before the present. The preservation of pollen was found to be patchy, probably because of wet-dry shifts during peat accumulation, but the plant and beetle remains were well preserved. These record changes in the environment on and around the coring location between c. 9000 and 1300 years before the present. The environmental changes can probably be attributed to a combination of natural factors, such as the movement of the river channel and human activities such as farming and settlement. The impact of human communities is especially clear around 1300 years ago, just before the analysed record ends. The value of these data for understanding long term processes of environmental change is discussed and recommendations for full analyses of the samples and further provision of radiocarbon dates made.

KEYWORDS: River Gipping, Palaeoenvironments, Floodplain, Holocene Landscape Change, Human Activity

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1. INTRODUCTION

Birmingham Archaeo-Environmental (BA-E) was subcontracted by Suffolk County Council Archaeological Service to undertake a palaeoenvironmental borehole evaluation on the proposed route of the Stowmarket relief road, which will join the A1308 Gipping Road (TM 0513 5861) to the Creeting Road (TM 0550 5881), via a new causeway and bridge across the River Gipping. The work was been funded by Integrated Capital Projects, Environment and Transport Department, Suffolk County Council as mitigation against the heavily piled construction of the relief road. A core sequence (HER SKT 053) of organic deposits 4.5m thick was recovered from adjacent to the river Gipping. Recommendations were made for the palaeoenvironmental assessment of pollen, plant macrofossil and beetles, supported by three radiocarbon dates (Hill 2008). This report describes the results of these assessments and makes recommendations for further analyses.

2. METHODS

2.1 Pollen Assessment

A total of 16 subsamples were assessed for pollen at 0.32m intervals throughout the sequence. Pollen preparation followed standard techniques including potassium hydroxide (KOH) digestion, hydrofluoric acid (HF) treatment and acetylation (Moore *et al.,* 1991). For assessment, at least 125 total land pollen grains (TLP) excluding aquatics and spores were counted for each sample. However, pollen concentrations were very low in a number of samples and full counts were not possible in these cases.

2.2 Plant Macrofossil Assessment

A total of five samples were processed and assessed for waterlogged plant macrofossils at a 0.50m sampling interval between depths of 4.00-4.50m, 5.00-5.50m, 6.00-6.50m, 7.00-7.50m and 8.00-8.50m. The samples were processed using the standard method of paraffin flotation outlined in Kenward *et al.* (1980). Once the beetle remains were sorted, the resultant flot remainders together with the paraffin residue were washed through a 300µm mesh sieve using a mixture of detergent and water to remove the paraffin from the organic material. These samples were then sorted to retrieve waterlogged plant-macrofossils under a low power binocular microscope at magnifications of x10 and x40.

Macrofossil identification was aided by the use of a modern comparative collection and by using various seed identification manuals (Anderberg, 1994; Beijerinck, 1947 and Berggren, 1969 & 1981 and Cappers *et al.,* 2006). The nomenclature and habitat information for this report follows Stace (1997).

2.3 Beetle Assessment

The five samples described above were also assessed for Coleoptera (beetle) remains. The insect remains were sorted from the paraffin flot as described above and the sclerites identified under a low power binocular microscope at x10 magnification. The system for "scanning" faunas as outlined by Kenward *et al.* (1985) was followed in this assessment. The taxonomy follows Lucht (1987). This assessment was carried out to answer four main questions:

1. Are any insect remains of interpretative value preserved?

2. Do any of the insects present suggest the nature of the environment in the area around the palaeochannel at the time of deposit formation?

3. What were the flow regimes and water conditions within the palaeochannel?

4. Do any of the insects indicate the nature of human activity at and around the site?

2.4 Radiocarbon Dating

Three sub-samples were submitted for radiocarbon dating to SUERC, East Kilbride. Sub-samples were taken from the top (4.10m), middle (6.26m) and base (8.50m) of the organic unit, where it was considered preservation conditions would yield sufficient amounts of organic carbon for dating. Each sample underwent acid/alkali/acid pre treatment prior to dating. Radiocarbon dates were calibrated using Intcal04 (Reimer *et al.*, 2004).

3. RESULTS

3.1 Pollen Results

Of the 16 samples submitted for pollen assessment, only 6 contained concentrations of well preserved pollen suitable for palaeoenvironmental assessment. These samples were: 4.02m, 5.46m, 7.70m, 8.02m, 8.34m and 8.50m. The relatively low numbers of samples precludes detailed interpretation and for this reason the diagram has not been zoned. The sample from 5.46m provided low pollen counts, although a full slide was traversed to ensure a sufficient count was obtained. The results are presented in the form of a pollen diagram (Fig.1), produced using TILIA and TILIA*GRAPH (Grimm 1991). A stratigraphic column recording sedimentology and radiocarbon dates are also provided to aid interpretation. All percentage figures are of Total Land Pollen (TLP) unless otherwise specified.

The base of the pollen diagram is dominated by tree and shrub pollen (c. 80-90%). *Corylus avellana*-type (hazel, but may include sweetgale) dominates the basal sample up to 50% with *Quercus* (oak), *Pinus sylvestris* (pine), *Ulmus* (elm) and *Tilia* (lime) also recorded. *Alnus glutinosa* (alder) rises from trace values at the base of the diagram to reach over 70% at 7.70m. Whilst percentages of *Corylus* and *Quercus* fall across these samples, values of *Tilia* and *Ulmus* are unaffected. The rise in *Alnus* is dated to after 8160±35 BP (7310-7210 Cal. BC; SUERC-20658).

Herbs are scarce other than Poaceae (wild grasses), with trace values (<1%) of Cyperaceae (sedges), *Filipendula* (meadowsweet), *Potentilla* (tormentil), Ranunculaceae undiff. (buttercups) and *Rumex* spp. (docks) recorded.

The basal segment of the diagram (between 7.70-8.50m) therefore reflects a transition from dry woodland consisting mainly of hazel and oak to alder fen carr. Alder must have become established on the floodplain, where increased wetness and the accumulation of peat resulted in conditions suitable for this tree and the exclusion of oak and hazel. The sparse record of herb pollen indicates some open habitats were probably initially present, probably in wetter areas, with grasses (such as *Phragmites*, the common reed) and a few other herbs typical of slightly unstable/disturbed environments of a floodplain.

The character of the vegetation growing in the wider landscape is unclear but it seems probable that mixed woodland in which both lime and elm were growing was established on drier soils.

Pollen concentrations were too low in the subsequent samples from 5.46m and 5.46m and 4.02m to permit assessment. The possible reasons for poor preservation will be discussed further below. A date of 3570±35 BP (2030-1870 Cal. BC; SUERC-20657) is available for a depth of 6.26m.

When the pollen record recommences at 5.45m, there has been a marked increase in herbaceous taxa at the expense of trees and shrubs. Total tree and shrub pollen values of less than 30% are apparent, with *Quercus* and *Corylus* maintaining relatively low but consistent values. Cyperaceae (sedges) are recorded at up to 65% TLP, whilst Poaceae has also increased slightly. Other herbs are rare with only small amounts of Apiaceae (the carrot family) and *Filipendula* (meadowsweet). Pronounced rises in the spores *Pteridium aquilinium* (bracken) and Pteropsida (ferns) are apparent.

The local floodplain environment has therefore changed from the alder fen carr indicated at the base of the diagram, to an open sedge fen. The wider landscape also appears to be significantly more open, with some scattered or distant oak-hazel woodland. The record is heavily dominated by the local pollen signal and discerning changes at a greater distance from the sampling site is difficult. The enhanced values for highly resistant spores such as Pteropsida may also indicate that the pollen record has been affected by differential preservation.

The top sample (4.02m depth) is also dominated by herbaceous pollen (c.70%), but this largely consists of Poaceae. Arboreal taxa are represented mainly by *Salix* (willow) with all other trees and shrubs recorded at values of less than 5%.

The environment on and around the sampling site therefore remained largely open, but was dominated by grasses rather than sedges. It seems likely that these could have been wetland grasses such as *Phragmites*, associated with evidence for an increase in areas of shallow water, suggested by rises in aquatic taxa such as *Potamogeton* (pond weeds), *Typha latifolia* (reedmace) and *Sparganium*-type (bur-reeds). There is also a pronounced increase in tall herbs, *Filipendula* in particular, but with Apiaceae and Caryophyllaceae (pink family), perhaps all indicative of open fen vegetation. *Lythrum salicaria* (purple-loosestrife) also appears for the first time; this species thrives in damp areas and fens but can grow in shallow areas of freshwater.

The precise character of the vegetation beyond the wetland remains less clear, but the appearance of *Plantago lanceolata* (ribwort plantain) at the top of the sequence implies an expansion in pasture land. Other possible 'anthropogenic indicators' (*sensu* Behre 1981) at this point include *Rumex* (docks) and perhaps *Cirsium*-type (thistles) whilst Cereal type pollen is also recorded at low values. This range of taxa suggest open, disturbed grassy habitats and possibly the cultivation or processing of cereals somewhere in the pollen catchment. At least a proportion of the Poaceae pollen is likely to derive from open grassland areas beyond the floodplain edge.

Trees and shrubs have increased slightly by this point, largely due to the appearance of *Salix* (willow), which would have been growing on the damp soils on around the sampling site. *Fraxinus excelsior* (ash) also appears, but would have been growing on drier soils beyond the floodplain; this species is also typical of secondary woodland and is hence further evidence of a human presence in the wider landscape.

The top of the diagram is dated to 1265±30 BP (SUERC-20656; cal. AD 660-830). By the close of the sequence, an open, grassy landscape with areas of shallow water and some willow carr is inferred. The dryland areas away from the site were probably open grassland but with possible evidence for arable farming and some areas of scattered or distant woodland.

3.2 Plant Macrofossil Results

All five samples contained well preserved organic remains which included: twigs, grassy fronds and seeds.

Sample 1: 8.00-8.50m

This sample only contained a few species, which included *Alnus glutinosa* L. (alder) and *Carex* spp (sedges) and cf. *Nymphaea alba* L. (water-lily). This suggests the presence of fen carr vegetation with areas of still, shallow water.

Sample 2: 7.00-7.50m

This sample yielded a few species including *Alnus* and *Carex*, indicating a floodplain environment similar to that of sample 1.

Sample 3: 6.00-6.50m

Seeds were recorded from taxa typical of floodplains such as *Alnus* but other macrofossils present were indicative of disturbed soils such as *Urtica dioica* L (nettles), *Stellaria neglecta* Weihe (greater chickweed) and *Rubus fructicosus* L.agg (bramble).

Sample 4: 5.00-5.50m

This sample contained seeds from a variety of plants, which commonly grow on damp or rough ground, including *Valerianella rimosa* (broad fruited cornsalad), *Carex* and *Chenopodium* sp (goosefoots).

Sample 5: 4.00-4.50m

A variety of seeds from plants which thrive in wet or damp places were again recorded. These included *Lycopus europaeus* L. (gypsywort), alder, *Betula pubescens* L. (downy birch), *Stellaria neglecta* Weihe and *Carex*. Other species more common in fields/waste ground included *Linum catharticum* L. (fairy flax) and *Anthemis cotula* L. (stinking chamomile).

3.3 Beetle Results

The insect taxa recovered from the flots are listed in Table 1. The taxonomy used for the Coleoptera (beetles) follows that of Lucht (1987). The numbers of individuals present is estimated using the following scale: * = 1-2 individuals ** = 2-5 individuals

*** = 5-10 individuals **** = 10+ individuals. When discussing the faunas recovered, two considerations should be taken into account:

1) The identifications of the insects present are provisional. Many of the taxa present could be identified to species level during a full analysis, producing more detailed information and the data presented here should therefore be regarded as preliminary.

2) The various proportions of insects are subjective assessments. Minimum numbers of individuals can only be obtained through a full sample analysis.

Sample 1: 8.00-8.50m
The insect remains from this sample were well preserved and readily interpretable although slightly corroded and fragmentary. The majority of taxa were aquatic species such as the elmid or 'riffle beetle', which is associated with running water and the 'splash zone' at the shores of lakes and other water bodies (Holland 1972). The gyrinid, *Gyrinius* sp. would suggest that in places, the water was relatively deep. Vegetation including sedges and mosses is indicated, with the pselaphid, *Brachygluta* sp. and the orthoperid, *Corylophus cassidoides*, typical of tussocky fens and swampy meadows (Pearce 1957). The Curculionidae, *Barynotus* sp. (Koch 1992) is a hygrophile found in similar conditions .

Sample 2: 7.00-7.50m
This produced the most restricted and poorly preserved assemblage from the samples. Despite the relatively small size of the assemblage and poor preservation, many of the sclera were still interpretable. The environment appears to be very similar to that of the previous sample, as the assemblage consists largely of aquatic and hygrophilous species directly associated with a flowing channel or its muddy banks. Indicators of the vegetation surrounding the deposit or the wider landscape are absent.

However, whilst the elimidae persist, they were present in smaller numbers suggesting sporadic input from a more rapidly flowing source. Large numbers of Hydraenidae were present alongside the hydrophilid *Chaetarthria seminulum,* which is also associated with mud and mosses at the periphery of lakes and rivers (Hansen 1987).

Sample 3: 6.00-6.50m
The material from this sample was well preserved and readily interpretable. The absence of Elmidae in this sample, coupled with the restricted nature of the aquatic assemblage, indicates reduced influence of aquatic conditions, with those species that are present indicative of ephemeral pools and muddy areas. Species associated with the floodplain vegetation include species of tussocky fenland, such as the Staphylinidae, *Lesteva longeoelytrata*, and *Olophrum* sp. (Tottenham 1954). Numbers of *C. cassidoides* have also increased. Indicators of damp, rotting plant matter are present; the Staphylinidae, *Oxytelus rugosus*, *Lathrobium brunnipes*, and *Phyllodrepa florialis*, are all associated with this type of material (Tottenham 1954).

Sample 4: 5.00-5.50m
The material from this sample was well preserved and the assemblage relatively large. A small increase in aquatic taxa may suggest that conditions, whilst wetter than those in the previous sample, were still drier than those seen in samples 1 and 2.

The range of terrestrial taxa has increased and the local vegetation surrounding the feature appears to have been subtly different. The presence of the carabid *Agonum thoreyi*, implies that taller reeds had begun to colonise the site (Lindroth 1974). The Hydrophilidae *Chaetarthria seminulum*, and *Ceolostoma orbiculare*, were both recorded in much larger numbers than previously. Both species are associated with similar, moss and sedge dominated tussocky meadows and fens (Hansen 1987).

Sample 5: 4.00-4.50m
This produced the largest and best preserved assemblage from this suite of samples. Distinctly aquatic species continue to increase and included the Dytiscidae, *Agabus* sp. and *Hydroporus* sp., and the Hydraenidae, *Helophorus* sp. and *Limnebius* spp, which were not previously recorded.

A change in the vegetation is indicated; species associated with moss and sedge tussock are virtually absent; whilst taxa associated with damp grassland, such as the weevils, *Barynotus* sp., *Apion* sp., and *Gymnetron* sp., demonstrate a significant increase (Koch 1992). The bruchid, *Bruchus* sp. is particularly associated with the *Vicia* spp. and *Pisum* spp. families (Koch 1992).

A small but nonetheless significant component of this sample consisted of species associated with dung, foul rotting material and possibly synanthropic environments. Specimens of both *Geotrupes* sp. and *Aphodius* sp., were recovered and whilst not generally abundant, they were present in large enough numbers to suggest the presence of grazing animals in the near vicinity of the sampling site. Furthermore, the lathridiid, *Corticaria* sp., the mycetophagid, *Typhaea sterecorea*, and the cucujid, *Monotoma* sp. are synanthropic species, commonly associated with human habitation and domestic waste (Hall and Kenward 1990; Kenward 1997, Kenward and Hall 1995).

3.4 Radiocarbon Dating Results
The radiocarbon dating samples are summarised in Table 2. All samples yielded sufficient organic carbon for successful dating and all analyses are reported as having proceeded normally. The basal peat sample (8.50m depth) dated to 8160±35 BP (7310-7210 Cal. BC; SUERC-20658), during the Mesolithic. The middle sample (6.26m depth) dates to 3570±35 BP (2030-1870 Cal. BC; SUERC-20657), the early Bronze Age. The upper sample (4.10m depth) dates to 1265±30 BP (SUERC-20656; cal. AD 660-830), the early Medieval period. It can be concluded that the radiocarbon dating framework has provided a reliable and conformable chronology.

4. DISCUSSION

Figure 2: shows the location of the bore (TM 0532 5874). The basal shell-rich silty peats started to accumulate during the Mesolthic at a date of 8160±35 BP (7310-7210 Cal. BC; SUERC-20658). It is clear that sediment accumulation was taking place in or near an active channel of the River Gipping at this time. The plant macrofossils suggest still water environments but the beetle assemblage portrays areas of deeper, running water. These differing interpretations can probably be reconciled by the fact that the sampling interval for both proxies is relatively broad and thus reflects episodes of

both increased and decreased river flow. The records are both possibly also reflecting some spatial differences in environment, with deeper flowing water of an active channel and stiller backwater deposits. The vegetation indicated by the pollen diagram largely represents the dryland mixed woodland of the wider environment, whereas the beetles and plants are reflecting local on site conditions.

A transition to dark brown herbaceous well-humified peat is recorded at 7.48m. Pollen concentrations were too low to produce sufficient counts for assessment between 7.50m and 5.50m, but the beetles and plant remains provide a good insight into the environmental conditions during this period.

The accumulation of peat is coincident with fewer beetles indicative of fast flowing water, suggesting a change in the flow regime of the river, perhaps as readjustment of local base levels towards the mid-Holocene resulted in lower energy, less active channel systems (e.g. Brown 1997). This was broadly coincident with the stabilisation of the floodplain through the establishment of alder carr. The presence of *Alnus* between 7.00-6.50m in the plant macrofossil record, suggests that fen carr remained significant on the damper soils of the floodplain up until at least 3570±35 BP (2030-1870 Cal. BC; SUERC-20657), the earlier Bronze Age.

The beetle record implies that the sampling site became drier as peat accumulation continued; this is particularly evident in sample 3 (6-6.50m). The reasons for this dry shift are unclear but it would seem that either the active channel of the River Gipping was flowing much more sluggishly or had migrated away from the sampling site. Alternatively, peat accumulation rates might have begun to outstrip rising watertables. The presence of plant macrofossils suggesting disturbed soils might reflect the impact of human activity on the floodplain or alternatively may reflect the sometimes naturally unstable environments of floodplains.

The beetle and plant records from 5.50m indicate further hydrological shifts with wetter conditions evidenced. Damp ground vegetation with tall reeds and sedges remained a significant part of the vegetation. The pollen record also illustrates this local dominance of sedges and indicates that some woodland persisted on the dryland areas.

All three proxies imply a pronounced change in the environment at the top of the sequence. Wetter conditions are evident, with the aquatic species in the pollen record implying shallow, still waters. There are also for the first time in the diagram strong indications of human impact, particularly in the beetle record. Taxa indicative of damp grassland, foul/rotting material and dung are recorded. The presence of 'synanthropic' beetles are especially significant and suggest the close proximity of settlement or an input of domestic refuse onto the sampling site. Evidence for human occupation is likewise apparent in the pollen record with plants typical of disturbed, ruderal environments including ribwort plantain, thistles, docks and cereals.

Taken collectively, the three proxy records therefore portray a wetland environment, but one proximal to and affected by, farming and settlement activity just before a date of 1265±30 BP (SUERC-20656; cal. AD 660-830). This suggests human disturbance during the early Medieval (Middle

Saxon) period. The evidence for wetter conditions precedes the subsequent deposition of organic silts on the sampling site evident in the lithostratigraphy. Again, the current data do not permit an understanding of the processes leading to this change in the depositional environment. It may reflect the re-activation of a channel at this location; or possibly the effects of anthropogenic activity.

The value of this sequence, in particular the later segment of the record is enhanced by the fact that two major archaeological sites are in the close vicinity of the sampling site. A major Roman villa site (Figure 2; SKT 018) is situated some 100m to the north-west of the coring location, and any environmental impact of this settlement should therefore be clearly resolved in the record. Thorney Hall, around 700m to the south-east (see Figure 2; SKT 012) was the mid-late Saxon settlement which was the precursor to the post-Norman conquest settlement of Stowmarket. The evidence for human activity towards the top of the core dates closely to this period and is quite probably related to the impact on the local environment of the settlement at Thorney. The name 'Thorney' is also relevant, suggesting the site was located on an island. The borehole data clearly shows the presence of wet, marshy ground in the vicinity at this time.

5. CONCLUSIONS AND RECOMMENDATIONS

The palaeoenvironmental assessment of the sequence from Stowmarket relief road has demonstrated that sediment accumulation began at the base of the core during the early 8th millennium BC, possibly within or close to a palaeochannel of the River Gipping. Peat accumulation continued within an alder fen until sometime after the Bronze Age, when a more open floodplain environment was established. This seems to have persisted throughout the prehistoric period until the later Holocene, when there is clear evidence for the impacts of human activity on the sampling site during the Medieval period.

Pollen preservation has been shown to be generally poor. It seems probable that this is related to hydrological fluctuations at the sampling site during sediment deposition. Higher concentrations of pollen seem to be associated with those periods for which the other proxy records suggest wetter conditions. Anaerobic conditions will tend to preserve palynomorphs better.

Beetle and plant macrofossil preservation has been shown to be generally good, providing diverse and interpretable records. These data portray a near complete record of Holocene environmental change at this site. With the exception of the analyses carried out at Scole in the Waveney valley (Wiltshire, forthcoming) few comparable datasets are available for Suffolk and indeed are generally rare nationally. Each assemblage indicates a dynamic hydrological regime subject to constant change throughout deposit formation and supports the hypothesis that this feature was a meander cut-off. Whilst the terrestrial environment in the lower four samples remains largely unchanged, that of the upper-most sample has changed dramatically and includes evidence of possible human agency.

Previous palaeoentomological work on the floodplain of this river is currently restricted to Lateglacial material from Sproughton (Rose *et al.* 1980). In the wider area, previous work on Holocene deposits in the valleys of the Waveney, Blackbourn and Lark produced limited data-sets (Tetlow 2007). Currently, the largest body of work of this type in Suffolk largely concentrates on earlier Quaternary material such as Coope (1974, 1992, 2006) and Taylor and Coope (1985).

This sequence has the potential to shed valuable light on environmental change and human activity in a region for which most environmental records tend to be somewhat fragmentary with the added consideration that known Romano-British and Saxon settlements are in the close vicinity of the sampling location. The following analyses are recommended:

- Full analyses of the beetle and plant macrofossil samples;

- Full beetle and plant analyses of the remaining four samples from the original evaluation of the borehole deposits.

- The provision of an additional six radiocarbon dates to provide a comprehensive chronology for the data which will allow an investigation of the interplay between human activity and natural environmental processes such as climate change.

- Due to the variable preservation, no further pollen analyses are recommended.

6. ARCHIVE

The borehole samples, subsamples and all electronic and paper records pertaining to the work at this site are held at B A-E. These samples will be retained until further notice.

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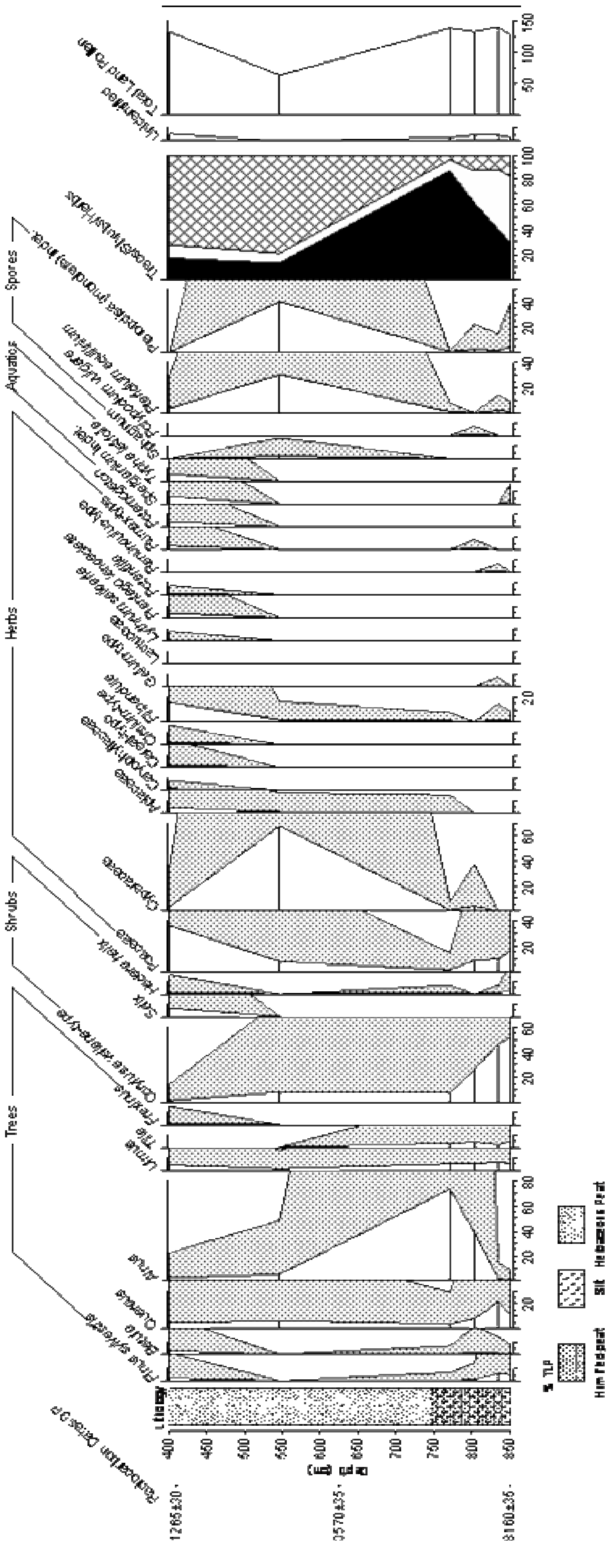

Fig 1. Stowmarket Percentage Pollen Diagram Shading = exaggeration x 10

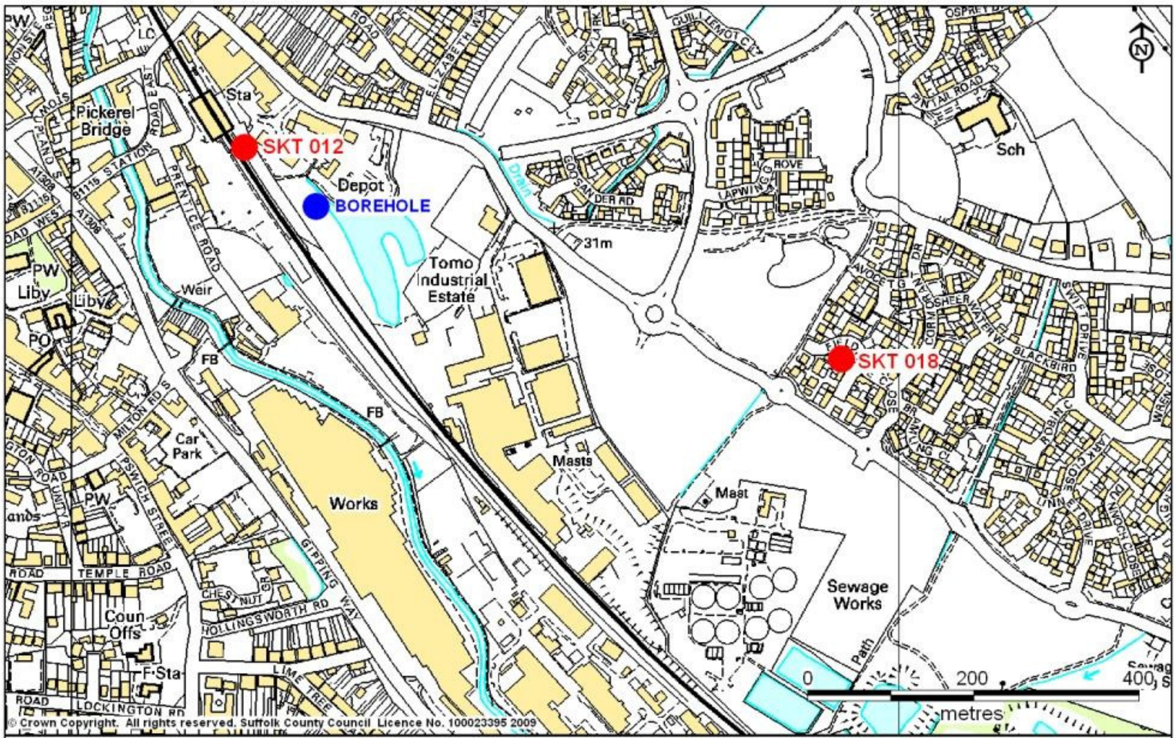

Fig. 2: B1115 Stowmarket Relief Road - Location of Archaeological Borehole (blue) and main sites (red)

Sample (m)	**8-8.5**	**7-7.5**	**6-6.5**	**5-5.5**	**4-4.5**
Processed Weight (kg)					
Processed Volume (l)					
COLEOPTERA					
Carabidae					
Carabus sp.					*
Bembidion sp.				**	**
Agonum thoreyi Dej.				*	
Pterostichus anthracinus (Ill.)				*	
Pterostichus minor Gyll.			*		
Pterostichus sp.	*		**		**
Gyrinidae					
Gyrinus spp.	*				
Dytiscidae					
Hydroporous sp.					
Agabus sp.	*				**
Hydraenidae					
Hydraena sp.	*****	***	****	***	*
Octhebius sp.	***	**	****	***	*
Limnebius spp.					**
Helophorus sp.	*			*	***
Hydrophilidae					
Coelostoma orbiculare F.					
Cercyon spp.				**	**
Hydrobius fuscipes Leach	*				
Cymbiodyta marginella (F.)					
Chaetarthria seminulum (Hbst., 1797)		*	***	**	
Orthoperidae					
Coryopholous cassidoides (Marsh.)	*	*	**		
Staphylinidae					
Phylodrepa floralis			*		
Omalium sp.				*	*
Olophrum sp.			*		
Lesteva longelytrata (Goeze, 1777)					
Lesteva spp.				**	
Oxytelus rugosus (F., 1775)			*		
Oxytelus spp.					*
Platystethus arenarius (Fourcr.)					*
Stenus spp.	**		*	**	**
Lathrobium brunnipes (F., 1792)			**	*	
Lathrobium sp.			*		
Philonthus sp.	*		*	**	
Xantholinus sp.					*
Tachyporus sp.					**
Tachinus sp.					*
Aleocharinae gen. & spp. Indet.	**				***

Pselaphidae					
Brachygluta sp.					*
Sample (m)	**8-8.5**	**7-7.5**	**6-6.5**	**5-5.5**	**4-4.5**
Scirtidae					
Scirtes sp.	*				
Dryopidae					
Dryops spp.	*				*
Esolus parallelepipedus (Mull.)		*			
Oulimnius spp.	****	*			
Cucujidae					
Monotoma spp.					**
Lathridiidae					
Corticaria spp.					*
Mycetophagidae					
Typhaea stercorea (L.)					*
Anobiidae					
Grynobius planus (F.)					*
Scarabaeidae					
Geotrupes sp.					*
Aphoduius erraticus (L.)					**
Aphodius spp.					**
Bruchidae					
Bruchus spp.					*
Chrysomelidae					
Plateumaris sericea (L.)	*				
Plateumaris/Donacia spp.	***	***	***	*	**
Phyllodecta sp.			*		
Prasocuris phellandrii (L.)					*
Phyllotreta sp.					***
Chaetocnema sp.		*			**
Curculionidae					
Apion sp.	*	*			**
Barynotus sp.					*
Sitona sp.					*
Bagous sp.			*		
Tanysphyrus lemnae (Payk.)					*
Baris sp.				*	
Ceutorhynchus sp.			*		
Gymnetron sp.	*				*

Table.1: Summary of the insect remains recovered during the assessment of the material from Stowmarket

Sample/Depth (m)	Lab Code	Material	δ13C o/oo	Radiocarbon Age BP	Calibrated Range 2σ
1850-4.10m	SUERC-20656	Peat	-29.2	1265±30	660-830 AD
1850-6.26m	SUERC-20657	Peat	-29.0	3570±35	2030-1870 BC
1850-8.50m	SUERC-20658	Peat	-29.8	8160±35	7200-7060 BC

Table.2: Summary of AMS radiocarbon dating results obtained from Stowmarket palaeoenvironmental assessment.