

## Assessment of environmental remains at Bures Common, Bures St Mary, Suffolk

### Site code: BUR/12

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*A single waterlogged sample from the base of a riverside ditch or stream includes flax retting waste and a broad range of wild flora and fauna. Corncockle seed coat fragments may indicate human faeces. The local environment was open, damp grassland with patches of more scrubby vegetation. Mollusc shells indicate very slow-flowing shallow water in the ditch or stream. Other hand-collected wood and root fragments are likely to represent trees and woody shrubs growing nearby. One fragment of worked wood, perhaps the remains of a square peg, requires specialist description. There is good potential for radiocarbon, insect and pollen analyses.*

### Methodology

One bulk sample has been assessed from a waterlogged ditch or stream base likely to be medieval to post-medieval in date. This feature is located on river floodplain on the outskirts of Sudbury, in an area thought to have been used in the past as a rubbish tip. A subsample was washed through a stack of 4mm, 2mm, 1mm, 500 $\mu$ m and 300 $\mu$ m sieves. The flots were then sorted wet under a Leica MS5 (x6.3 – x50) binocular microscope. A further 6 litre subsample was washed over a 4mm sieve for artefact recovery, and a 5 litre subsample flotation sieved over 300  $\mu$ m and archived.

Waterlogged wood fragments collected by hand during excavation were thin-sectioned using a razor blade. Transverse (TS), radial (RLS) and tangential (TLS) sections were temporarily mounted with distilled water on glass slides, for examination under a Nikon Labophot 2 microscope at x100–x200 magnification.

Full raw data is summarised in Table 1 at the end of this report. Nomenclature follows Stace (1997) for plants and Beedham (1972) for molluscs. Identifications were made using the reference collections of the Pitt-Rivers Laboratory for Bioarchaeology, Division of Archaeology, University of Cambridge.

### Preservation

Both waterlogged and charred plant remains are present. The few charred plants may have been brought by water from elsewhere. Good waterlogging only occurs below 1.80m depth (in fill 35), where hand-collected wood is consistently identifiable to taxon. Many of the wood and root fragments from 1.70–1.80m depth are poorly preserved with numerous microscopic fungal bodies. There are low to moderate quantities of insect exoskeletons, mostly of beetles (Coleoptera) that represent the local environment. Mollusc shells and ostracod valves (tiny aquatic crustaceans) are well preserved and represent solely the aquatic environment.

### Results

#### *Plant macrofossils and invertebrates*

All of the waterlogged macrofossils and invertebrates are from bulk sample <1> at 2.10m depth in basal fill 36. There is a single charred grain of barley (*Hordeum vulgare*). The range of waterlogged seeds represents terrestrial plants likely to have grown on the ditch/stream banks and surrounding land (allochthonous), and aquatic/semi-aquatic plants that would have grown in the wet base (autochthonous).

A number of the plants are notable as they suggest human activity. Flax seeds and capsules (*Linum usitatissimum*; Figure 1) are likely to represent debris from retting in the ditch/stream itself. Human faeces are suggested by tiny fragments of corncockle (*Agrostemma githago*), and perhaps also by seeds of elder (*Sambucus nigra*) and bramble (*Rubus* subgen. *Rubus*). Even if the latter two plants do not represent faeces, both are often found growing on disturbed land at the margins of settlements.

The most abundant plant remains are fragments of wood and twigs, with occasional delicate leaf fragments illustrating good preservation. In contrast macrofossil evidence for trees or shrubs is limited, with no seeds and only a small number of flower bracts of willow or sallow (*Salix* sp.). This disparity may be a result of the formation processes – e.g. flood events ‘flushing away’ the seeds – but excellent preservation of other small seeds suggests that the brushwood may have been brought from elsewhere in the local environment.

Seeds of stinging nettle (*Urtica dioica*), goosefoots (*Chenopodium* sp.), docks (*Rumex* sp) and thistles (*Cardus/Cirsium* sp.) all suggest open disturbed ground. The first two taxa also indicate nutrient-enrichment, either from animal dung or other organic refuse. Buttercups (*Ranunculus acris/bulbosus/repens*) are more characteristic of open, damp grassland, especially pasture. Many of the other plant seeds are characteristic of damp, shady to open habitats, such as lesser chickweed (*Stellaria neglecta*), cow parsley (*Anthriscus sylvestris*) and hemp-nettle (*Galeopsis* sp.). Plants likely to have grown on the ditch/stream banks include nodding bur-marigold (*Bidens cernua*), rushes (*Juncus* sp.), sedges (*Carex* sp.) and spike-rush (*Eleocharis palustris*).

A range of aquatic to semi-aquatic plants illustrate that the water body was probably clean and still to slow-flowing. The more abundant species are pondweed (*Potamogeton* sp.), horned pondweed (*Zannichellia palustris*) and common club-rush (*Schoenoplectus lacustris*). There are also low numbers of bog bean (*Menyanthes trifoliata*), crowfoot (*Ranunculus* subgen. *Batrachium*) and water-plantain (*Alisma plantago-aquatica*).

The molluscs are exclusively aquatic types that represent the wet base of the ditch/stream, notably *Bithynia tentaculata*, *Bathyomphalus contortus* and *Sphaerium/Psidium* sp. The wide range of aquatic molluscs indicates a continuously wet environment which is consistent with the good preservation by waterlogging of plants and insects. The snails *Anisus leucostoma* and *Lymnaea truncatula* do tolerate drying episodes but are present only in low quantities.

There is no clear evidence for stagnant conditions, such as water flea ephippia (winter eggs) that can become abundant in stressed aquatic environments. However the beetle remains have not been identified and may indicate otherwise.

#### *Hand-collected waterlogged wood*

##### 2.10m depth, fill 36

One fragment of alder roundwood (*Alnus* sp.), some fungal damage

##### 1.80–2.10m depth, fill 35

- A. One fragment of ash wood, *Fraxinus* sp., some fungal growth
- B. One fragment of willow/poplar wood (*Salix/Populus* sp.), heavy fungal growth
- C. One fragment of willow/poplar wood (*Salix/Populus* sp.)
- D. One indeterminate woody root fragment
- K. One fragment of ash wood, *Fraxinus* sp.
- L. One fragment of ash wood, *Fraxinus* sp., some fungal growth
- M. One fragment of ash wood, *Fraxinus* sp.

1.70–1.80m depth, fill 35

- A. Multiple fragments of indeterminate wood or woody root
- B. One indeterminate woody root fragment
- C. One indeterminate wood fragment with bark, extensive fungal growth
- D. One fragment of probable willow/poplar (*Salix/Populus* sp.)
- E.F.G. Three fragments of indeterminate wood or woody root
- H.I.J. Three small fragments of indeterminate wood or woody root

Alder, ash and willow/poplar are often associated with damp soils and are consistent with the river-side setting, however only the willow/poplar has corresponding macrofossils (flower bracts) in basal fill 210. The poor preservation of wood from 1.70–1.80m depth suggests this is the seasonal limit of the water-table.

*Worked wood*

The wet sieving of a further 6 litre sub-sample generated a single fragment of a probable square peg (Figure 2). The dimensions are 52mm length, with a cross-section that tapers gently from 19x17mm at one end to 15x15mm at the other.

Superficial examination under a low-power microscope (x40) suggests that the peg is not oak, but possibly ash wood. Confirmation of species will require thin-sectioning, which should not be undertaken until a wood working specialist has examined the fragment.

**Discussion**

*Linen production*

Retting is an early stage of flax processing where the dried stems are soaked in pools of water to partially rot ('ret'), releasing the bast fibres from other stem tissues. Still pools or slow-flowing streams were traditionally favoured, with the flax soaked for up to 2 weeks (Boase 1918). Retting was smelly and therefore usually carried out on the margins of settlements. The resulting fibrous mass then needed to be dried and 'dressed' (by breaking, scutching and heckling) before it could be spun. This labour intensive process has often left waterlogged flax capsules, seeds and sometimes stems, notably at Middle Saxon Brandon (Carr *et al.* 1988), Late Saxon West Cotton (Campbell 1994) and many other riverside sites in Britain (Robinson 2003).

The wooden peg fragment may also be from flax retting. At West Cotton, Northants. (Campbell 1994), an oak peg fragment associated with waterlogged flax was interpreted as a means of holding the bundles of flax under the water. Radiocarbon dates on the flax and peg from this site indicated the 7-9<sup>th</sup> centuries AD.



Figure 1: Waterlogged flax capsule fragments and seeds from fill 36, 2.10m depth (scale in mm)



Figure 2: Waterlogged square peg fragment, probably of ash, in fill 36 depth 2.10m (scale also in mm)

The late medieval textile industry of the Stour Valley is discussed by Phythian-Adams (2002, 251), who describes regional specialism in the preparation of natural fibres such as wool, hemp, and flax followed by their spinning, weaving and manufacture into articles of clothing. In the post-medieval period these skills were extended to the finer cloths of the 'New Draperies' and then to silk weaving. Finally, in the nineteenth century, horsehair and coconut fibre were also processed before the Industrial Revolution led to the demise of this rural Suffolk industry.

There are sporadic references to flax processing in local historic records. For example, the Grade II listing for Hold Farmhouse on nearby Nayland Road (TL 92204 33974) mentions it as '...said to have been a flax mill. C16, C17, C19.' (British Listed Buildings website 2012). Further upstream on the Stour, the Bury and Norwich Post reported on April 24<sup>th</sup> 1877 an accident at Melford Flax Mill, and there is still a 'Flax Lane' in Glemsford that leads towards the confluence of the Rivers Stour and Glem.

#### *The local environment*

There is very limited evidence for human activities other than flax retting, on what appears to have been damp, rough grassland next to the River Stour. Low amounts of wood charcoal and a single charred barley grain could have been brought by water from elsewhere; although fragments of waterlogged corncockle seed-coat (testa) almost certainly represent human faeces. Corncockle was a troublesome weed of medieval and post-medieval cereals, being difficult to remove from harvests as the seeds were of similar size and weight to cereal grain. As a result, the seeds were often a proportion of milled flour, were then consumed and the indigestible seed-coats were passed in faeces (*cf.* Clapham 2005). A few seeds of bramble and elder may also represent human/animal faeces or simply nearby vegetation.

There is a disjuncture between the waterlogged macrofossil and wood assemblages. Only willow or sallow (*Salix* sp.) is represented both as flower bracts in fill 36 and also as wood fragments from 1.70–2.10m depth. Neither the ash or alder roundwood fragments recovered below 1.80m depth have any corresponding waterlogged seeds, which suggests either the seeds had been 'flushed away' by flood water or that the wood was brought from elsewhere. The latter scenario is possible, given the excellent preservation of many other small seeds in the ditch/stream base. It may be that brushwood was introduced to manage the water flow for flax retting.

The apparent lack of water pollution, despite the evidence for flax retting, is consistent with the findings of Robinson (2003), who suggests that flowing water bodies were often used for retting rather than still to stagnant water.

#### **Recommendations**

The plant and mollusc assemblage is of *local to regional significance* for reconstructing the past environment and economy of Bure St Mary, one of many historic villages along the Stour Valley. These remains would be of clearer regional significance should radiocarbon dating reveal that the flax retting is of medieval or earlier date. Unfortunately ambiguities in the radiocarbon calibration curve after AD 1600 mean that a later date may only be interpretable as 'post-medieval'.

The good anoxic conditions below 1.80m depth show there is *excellent potential for pollen and insect analyses, should radiocarbon dating be successful*. The remainder of the sample has been processed – a further 0.4 litres for macrofossil analysis and 5 litres flotation sieved and refrigerated in case insect assessment is desirable.

Insects are very sensitive to local environments and human activity, providing a much richer picture than plant remains alone. Pollen analysis would require collection of a monolith or core during any future excavation; this could provide a landscape context for the other ecofacts.

The additional wet sieving generated a large worked wood fragment, possibly of a square peg, which should be described by a wood working specialist.

No further work is recommended on the mollusc remains in this report. Should the report be published, a further half day would be required to analyse the other 400ml subsample and to make the waterlogged macrofossil results more statistically robust.

## References

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Feature type		Ditch/stream
Context		210
Sample number		<1>
Sample volume		10 litres
Sub-sample volume		400ml
Flot fraction assessed -%		100
Taxonomic name	English name/ mollusc habitat	
<b>CHARRED ECONOMIC PLANTS</b>		
<i>Hordeum vulgare sensu lato</i>	Barley grain	1
<b>CHARCOAL estimated volume</b>		
charcoal <4mm		< 1ml +
<b>WATERLOGGED ECONOMIC PLANTS AND RELATED TAXA</b>		
<i>Linum usitatissimum</i> L. seed	Flax	+
<i>Linum usitatissimum</i> L. capsule fragment	Flax capsule	++
<i>Agrostemma githago</i> L. seed-coat fragment	Corncockle seed-coat fragments	+
<i>Sambucus nigra</i> L. seed	Elder	*
<i>Rubus</i> subgen. <i>Rubus</i> seed	Bramble	*
<b>WATERLOGGED TERRESTRIAL FRUITS AND SEEDS</b>		
large <i>Ranunculus</i> cf. <i>bulbosus</i> L./ <i>acris</i> L./ <i>repens</i> L. achene	cf. Bulbous/Meadow/Creeping Buttercup	+
<i>Ranunculus flammula</i> L. achene	Lesser Spearwort	*
<i>Urtica dioica</i> L. seed	Stinging Nettle	*
<i>Chenopodium</i> spp. seed	Goosefoots	+
<i>Stellaria neglecta</i> Weihe seed	Greater Chickweed	*
<i>Rumex hydropathalum</i> Huds. achene	Water Dock	*
<i>Rumex</i> spp. small seed [<3mm]	Small-seeded Docks	+
<i>Salix</i> sp. bract	Willow flower fragment	+
<i>Anthriscus sylvestris</i> (L.) Hoffm. mericarp	Cow Parsley	*
<i>Chaerophyllum temulum</i> L. mericarp	Rough Chervil	*
<i>Galeopsis</i> sp. nutlet	Hemp-nettles	*
<i>Carduus/Cirsium</i> sp. achene	Thistles	*
<i>Juncus</i> spp. seed	Rushes	+
Indeterminate seeds [<3mm]		
<b>WATERLOGGED AQUATIC AND SEMI-AQUATIC FRUITS AND SEEDS</b>		
<i>Ranunculus</i> Subgen. <i>BATRACHIUM</i> (DC.) A. Gray achene	Crowfoot	*
<i>Apium nodiflorum</i> (L.) Lag. mericarp	Fool's-water-cress	*
<i>Bidens cernua</i> L. achene	Nodding Bur-marigold	*
<i>Menyanthes trifoliata</i> L. seed	Bogbean	*
<i>Alisma plantago-aquatica</i> L. seed	Water-plantain	*
<i>Potamogeton</i> sp. achene	Pondweed	+
<i>Zannichellia palustris</i> L.	Horned Pondweed	+
<i>Schoenoplectus lacustris</i> (L.) Palla nut	Common Club-rush	+
<i>Eleocharis</i> cf. <i>palustris</i> (L.) Roem. & Schult. nut	Common Spike-rush	*
<i>Carex</i> spp. lenticular nut	True Sedges two-sided seed	*
<b>WATERLOGGED VEGETATIVE PLANT PARTS</b>		
Bryophyte fronds	Moss stems with leaflets	*
Indet. wood fragments		+++
Indet. twig fragments		++
Dicotyledonous leaf fragments		*
Monocotyledonous vegetative fragments	Grass/rush/sedge leaves and stems	+
Indeterminate rootlets		+
<b>OTHER BIOTA</b>		
Ostracod valves	Tiny aquatic crustacea	+
Coleopteran exoskeleton	Beetle exoskeleton fragments	+
Caddis fly larval case		+
Fish scale		*
Tiny fish vertebra		*
Fish bone		*
<b>AQUATIC MOLLUSC SHELLS</b>		
<i>Bithynia tentaculata</i> (L.)	Quiet rivers and still water, not small ponds	++
<i>Bithynia tentaculata</i> (L.) operculum	Quiet rivers and still water, not small ponds	+
<i>Bithynia leachii</i> (Sheppard)	Slow flowing, thickly weeded water	*
<i>Lymnaea truncatula</i> (Müller)	Shallow waters & flooded pastures	*
<i>Lymnaea palustris</i> (Müller)	Marshy areas, incl. ponds, ditches, lake edges	*
<i>Lymnaea peregra</i> (Müller)	Many aquatic habitats	+
<i>Planorbis planorbis</i> (L.)	Ditches and ponds	+
<i>Anisus leucostoma</i> Millet	Seasonal ponds and ditches	+
<i>Gyraulus albus</i> (Müller)	Amongst vegetation in many aquatic habitats	*
<i>Bathymophalus contortus</i> (L.)	Weed in flowing/still waters	++
<i>Sphaerium/Pisidium</i> sp.	Many aquatic habitats, usually flowing water	+++
<b>OTHER ITEMS</b>		
vivianite	Copper salt complex	*

**Table 1: Waterlogged flora and mollusc shells from Bures Common (BUR/12)**

KEY: \* 1 or 2 items, + <10 items, ++ 10-50 items, +++ >50 items