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**Assessment of biological remains from  
excavations at Withow Gap, Skipsea, Humberside  
(site code: CAS489)**

by

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**Summary**

*Two vertical series of sediment samples from excavations of the Flandrian peats at Withow Gap, Skipsea, were assessed for their content of plant and invertebrate macrofossils. Fossils were present in varying amounts and states of preservation, plant remains usually being more abundant than insects. The sediments and their biota document a succession from water fringed by trees through a stage of semi-terrestrial alder carr and eventually into a phase of mineral deposition, perhaps associated with destabilisation of soils in the surrounding catchment.*

*It is suggested that detailed reconstruction of the depositional basin and its immediate surroundings would be possible with further analysis of much larger subsamples. However, the absence of direct evidence for human activity and the substantial time and cost implications of full analysis militate against further work funded by English Heritage. The material would form a useful component of a research council-funded project on post-glacial landscape development.*

*Identification of a series of over 70 timbers showed the bulk to be alder, with a few ash and occasional willow and hazel; the ash specimens mostly showed very narrow annual rings, consistent with trees growing under adverse conditions.*

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## Assessment of biological remains from excavations at Withow Gap, Skipsea, Humberside (site code: CAS489)

### Introduction

A series of general biological analysis (GBA, *sensu* Dobney *et al.* 1992) samples, bulk-sieving (BS) samples and timbers were collected during excavations of the Flandrian peats exposed in cliff sections at the Withow Gap, near Skipsea in July 1993. Of the 112 GBA samples, twelve were selected for analysis in the laboratory; these were from two of the vertical sequences—six from each of series 505 (Area 1, where the sequence was thickest) and 565 (Area 2, towards the edge of the basin).

The bulk-sieved samples were processed by staff at Central Archaeological Service in an attempt to determine whether any bone was present. The residues appeared to be devoid of this material and were not examined further.

The timbers were all identified during the assessment phase to avoid the need for long-term storage under controlled conditions.

Two large pieces of timber were examined by MH and Barrie Constantine for the remains of insects associated with wood.

### Methods

#### (i) Sediment samples

For the GBA samples ‘test’ subsamples of 0.5 kg were employed in each case, following the methods of Kenward *et al.* (1980) as modified by Kenward *et al.* (1986). In two cases, ‘washovers’ rather than ‘flots’ were taken, since the content of insect remains appeared to be, at best, extremely low. The washovers and flots were examined for their content of invertebrate remains, especially insects. Plant remains were examined in all the wet residues and in the two washovers.

Further subsamples from the two series of GBA samples were tested for their organic content using ‘loss on ignition’. For this, small amounts were oven-dried to constant weight, ignited in a furnace at 850 C for 1.5 hours, then reweighed.

#### (ii) Timbers

Timbers were identified by means of thin sections using a hand-held single-sided razor blade. Sections were bleached in dilute hydrochloric acid and examined by means of transmitted and incident light microscopy.

The two large timbers sampled for an investigation of bark and wood-boring beetles were broken apart in the laboratory and frass within burrows excavated and retained for analysis. Some samples of material within cavities in the timbers were disaggregated and subjected to paraffin flotation. The result of these investigations will be reported elsewhere.

### Results

#### (i) The sediment samples

The nature of the sediments for the GBA samples from the two areas is described in stratigraphic order from the base of each sequence, together with comments on the plant and invertebrate remains observed. Context information is given in brackets. Result of the loss on ignition exercise are given in Appendix 2.

#### Series 505, Area 1

*Context 213* [gyttja; the lowest level reached in Area 1]

*Sample 806*

Moist, very dark grey/brown, brittle (working crumbly), amorphous organic sediment with traces of herbaceous detritus. Twigs and nutshell were also present.

The moderately small residue contained a few twig fragments to 10 mm diameter with a little wood and bark to 10 mm, but consisted mostly of pellets of undisaggregated sediment. The most abundant plant remains were fragments of ?tree leaf, and there were bud-scales and fruits of alder (*Alnus*) and bud-scales of oak (*Quercus*). There was also a leaf fragment of yew (*Taxus*). The only other identifiable plant remains were three mosses (two of them, at least, species likely to have grown on bark) and one fruit of a waterside plant, cowbane (*Cicuta virosa*). There were rather low concentrations of identifiable remains but preservation was quite good.

The flot contained large quantities of invertebrate remains, mostly immature stages, but with an assemblage of beetles which was of modest size. These remains indicated aquatic deposition, although there were appreciable numbers of terrestrial forms, too. It would be necessary to process a substantially larger subsample (perhaps 2-3 kg) to obtain a large enough assemblage for a detailed interpretation to be attempted.

*Context 213* [gyttja]

*Sample 751*

Very dark grey/brown, brittle and soft (working crumbly), moist amorphous organic sediment, with fine and coarse woody herbaceous detritus.

The moderately large residue included some bark to 20 mm, twigs (including alder) to 15 mm diameter and abundant ?tree leaf fragments. There was a larger range and concentration of identifiable remains than in the sample below and preservation was very good. Together with various remains of alder and oak, a key fragment of ash (*Fraxinus*), cowbane and a few mosses (some, again,

corticolous), there was a seed of white water-lily (*Nymphaea alba*) and nutlets of sedge (*Carex*).

The flot was rather large and consisted in substantial part of invertebrate remains, mostly immatures. There was a fairly small group of adult bugs and beetles, their origins being both in water and in terrestrial habitats. It would be necessary to process perhaps 4-6 times the quantity examined here in order to provide enough insect remains to permit more detailed ecological reconstruction.

*Context 208* [peat; a thick layer across the whole section]

*Sample 643*

Moist, dark grey/brown, brittle, slightly layered and compressed, and soft (working crumbly), amorphous organic sediment with fine, coarse woody and herbaceous detritus.

The rather large residue included much undisaggregated sediment but there were also a few twig fragments to 15 mm diameter including ash (which was very poorly grown, the annual rings being barely distinguishable). Tree taxa were represented by remains of alder and oak with a single fruitstone of alder buckthorn (*Frangula alnus*) and a ?immature lime (*Tilia*) fruit. White water-lily and cowbane were again present, with hornwort (*Ceratophyllum* sp.) and yellow water-lily (*Nuphar lutea*.) representing aquatic and waterside herbaceous taxa. Some caddis larval case fragments and mollusc periostracum fragments (membranous tissue from decalcified shell) were also present.

The flot consisted mostly of invertebrate remains, principally immature stages of insects. There were also moderate quantities of adult beetle and bug remains, although these were highly fragmented. Aquatic and, to a smaller extent, terrestrial, habitats were represented. A much larger subsample than that processed for assessment would be required for extraction of an interpretable assemblage, and since

much of the fragmentation observed may have occurred during processing, exceptionally gentle disaggregation would be necessary.

*Context 208* [peat]

*Sample 557*

Moist, dark brown, brittle to soft amorphous organic sediment with abundant blackish moss stems.

The material in the residue from this subsample was rather different from that in the subsample from 643 from the same layer: there were many moss stem fragments, especially in the >4 mm fraction. A few twig fragments to 10 mm diameter were present along with ?tree leaf fragments and other plant debris. The moss stems have been identified tentatively as *Fontinalis* sp. but the near absence of well-preserved leaves makes accurate determination difficult. (*Fontinalis* spp. are mosses of waterside and aquatic habitats, typically, but by no means exclusively, found on submerged rocks in flowing water.) Also present were pondweed (*Potamogeton* sp.) fruits with white and yellow water-lily and the aquatic and aquatic-marginal taxa water-dropwort (*Oenanthe*), spike-rush (*Eleocharis palustris*), bur-reed (*Sparganium*) and water-plantain (*Alisma* sp.). Preservation was somewhat variable but essentially good and the concentration of identifiable remains moderately high. Caddis larval case and mollusc periostracum fragments (see context 208) were also observed in the residue.

The flot was large and contained modest numbers of insect remains from aquatic and terrestrial habitats. There were at least two taxa which would require museum work for identification (an anobiid and an unfamiliar ?longhorn beetle). Subjectively, this assemblage was more diverse than others from the site, but a large subsample would be required to enable environmental reconstruction at a useful level of detail.

*Context 207* [peat; this thin layer overlying peat 208 had a small silt component]

*Sample 522*

Moist mid to dark brown brittle (working crumbly), amorphous organic sediment with traces of modern rootlets.

The rather small residue was mostly undisaggregated sediment of somewhat indurated silty humic material including many rather fibrous fragments. The coarse fraction included a few wood and twig fragments to 20 mm. Identifiable plant remains were sparse and included alder, with a small number of herbaceous types typical of waterside habitats. Preservation was poor to good and the concentration of identifiable remains very low.

The small flot contained few insects, but those present were varied and gave promise of interpretative potential were a much larger subsample processed.

*Context 206* [clay; covering the organic deposits across the whole basin]

*Sample 513*

Mid to dark grey/brown stiff (sticky when wet, working plastic), clay with darker and lighter mottling on the 1 mm scale and traces of modern rootlets.

The tiny residue consisted of undisaggregated silt and clay with a little sand and a few gravel clasts to 5 mm. There were scraps of unidentifiable plant tissue including a little very decayed wood and some ?modern rootlet fragments. The only identifiable taxon was *Alisma* (a single 'embryo'). The washover, however, was quite rich in these *Alisma* remains though preservation was still extremely poor. Also present were a few *Juncus* seeds (including toad-rush, *J. bufonius*) and hemp agrimony (*Eupatorium cannabinum*) achene fragments, together with *Cenococcum* (fungal) sclerotia and earthworm egg capsules, the last two

probably washed in with soil from around the basin. There were only traces of insect remains, these being very decayed.

## Series 565, Area 2

*Context 215* [sand; probably part of the Devensian sequence underlying the Flandrian organic deposits]

*Sample 778*

Moist, moderately heterogeneous, light yellow/brown unconsolidated sand. The minor component was a mid grey/brown silty clay sand, although there appeared to be more than one layer mixed in. Charcoal was present, and also wood (some of which was noted at the time of description as possibly contaminant).

The very small residue consisted mainly of sand with a few angular pebbles to 25 mm and a little very decayed wood and twig fragments to 25 mm. There was also what appeared to be charcoal to 15 mm and some coal (doubtless from the local drift) to 10 mm. A few poorly preserved moss fragments were present along with some waterside and aquatic taxa, notably *Potamogeton* sp., stonewort (Characeae) and bogbean (*Menyanthes trifoliata*). There were also quite abundant sedge (*Carex*) nutlets. The only trees present were birch (*Betula*) and poplar/aspen (*Populus*).

Also present in the residue was a roach (*Rutilus rutilus* L.) tooth and arvicoline vole M2 tooth fragment (both identified by B. G. Irving). Other macrofossil invertebrate remains in this fraction included snail opercula and modest numbers of caddis larval case fragments. Although adult insect remains were noted in the residue, the flot contained very few, among these being several sclerites from *Meligethes* sp., clearly modern (these insects were present in thousands during the excavations). It seems unlikely that sufficient insect remains for useful interpretation would be recovered from a large subsample.

*Context 212* [peat; equivalent to 208]

*Sample 776*

Mid to dark purplish black, brittle (working crumbly), moist, coarse woody and amorphous organic sediment. Stones of the range 6-20 mm and wood (probably bark) were present. Traces of sand were probably contaminant.

There was a large residue consisting mainly of coarse bark fragments (to 100 mm) with a little wood and some gravel (to 10 mm) and sand and moderate numbers of ?tree leaf fragments. Remains of alder (buds, bud-scales, fruits, female cone axes and male catkin fragments) made up the bulk of the identifiable macrofossils and oak bud-scales and hazelnut (*Corylus avellana*) nutshell fragments were also present.

The flot contained large quantities of insect remains, mostly immature stages. There was a quite small group of adult beetles and bugs (perhaps 20 individuals), these including a substantial proportion of terrestrial forms. There were remains of several *Meligethes* sp., apparently of modern origin (see context 215).

*Context 212* [peat]

*Sample 679*

Moist, very dark brown brittle to slightly compressed, crumbly amorphous organic sediment with fine and coarse woody herbaceous detritus and slight grey/brown 1 mm scale mottles.

The moderately large residue consisted of bark and wood to 50 mm with a little gravel and some sand. The wood fragments gave something of the appearance of having dried out at some stage, perhaps having been deposited at a time of changing water-levels. Trees were again the most important plants represented by identifiable remains, with alder and oak both present. However, preservation was poor and the concentration of identifiable remains low. Caddis larval case

fragments were also noted in the residue.

Remains of a few beetles were present in the flot, but it is unlikely that even a 5 kg subsample would produce a useful list.

*Context 212 [peat]*

*Sample 627*

Just moist, very dark purplish brown, brittle (working crumbly), amorphous organic sediment with pale yellow sandy partings.

The small residue was mostly very decayed wood with some herbaceous detritus and of a different appearance to the residue from the other subsample examined from this context (679). There were also traces of gravel to 10 mm and a little sand. The poorly preserved plant macrofossil remains, present in low concentrations, again included hazelnut and alder but there were also a few *Cenococcum* sclerotia, probably washed in with soil around the basin.

Insect remains were rare in the flot, and some of those present were clearly modern contaminants, as were fragments of a millipede. This deposit has extremely limited potential for interpretation, however large a subsample were to be processed.

*Context 210 [peat]*

*Sample 569*

Very dark grey/brown, brittle to weakly layered and slightly compressed (working crumbly), moist amorphous organic sediment with light yellow sandy partings. Occasional traces of herbaceous detritus and ochre-coloured silt were also present.

The moderately large residue was mostly undisaggregated humic sandy silt which would probably have passed the 300 µm sieve had it been broken down further. There were traces of gravel to 10 mm and a little charcoal of similar size, with

some wood, bark and herbaceous detritus. Apart from a poorly preserved rush (*Juncus* sp.) seed and *Cenococcum* sclerotia, no identifiable plant remains were observed. Caddis larval case fragments were noted but there was no more than a trace of other arthropod remains.

*Context 209 [clay]*

*Sample 567*

Light to mid grey/brown, stiff (working plastic), moist clay with slightly lighter and darker 10 mm scale mottles and stones present in the range 6-20 mm.

The minute residue of <5 cm<sup>3</sup> consisted of sand with a trace of coal to 10 mm. The washover contained a few *Alisma* 'embryos' with moderate numbers of stonewort oogonia and many *Juncus* seeds, some (perhaps most?) of which were toad-rush, *J. bufonius*. Fragments of three beetle taxa and a few other arthropod remains were the only invertebrates noted from the flot.

*(ii) Timbers*

The timber identifications are presented in Table 1, Appendix 1.

**Discussion**

The evidence from plant and invertebrate remains clearly demonstrated this to be essentially a natural sequence of aquatic and marsh deposits. There was nothing from the biota to indicate the presence of human beings, unless the silting and associated changes in fauna and flora towards the top of the peat were secondary results of cultivation of the surrounding terrain.

Consistent with the large quantities of wood and bark observed during excavation, the plant assemblages were dominated by remains of woody taxa, whilst aquatic and waterside herbaceous plants were usually rather rare, although their numbers may have been somewhat diluted at some levels by the sheer bulk of coarse woody material. The sparse remains in the uppermost clay indicate a marsh environment with deposition of silt and clay into water. The loss on ignition data (Appendix 2) indicate how silting into the upper organic horizons was much more pronounced for the sequence in Area 2 (Series 565) than for that from Area 1 (Series 505)—consistent with its more marginal position.

### Statement of potential

A more detailed reconstruction of the depositional history within the basin at Withow Gap and of the surrounding terrestrial habitats could be made from analyses of a series of large subsamples. However, these analyses would be unlikely to add *more* than detail to the reconstruction made on the basis of the assessment records. Meticulous work would probably produce some novel records of insects, including some woodland taxa, but it is unlikely that important historical or biogeographical insights would result. It is thus hard to justify the very substantial expense of further analyses in *archaeological* terms.

### Recommendations

No further analyses of the plant and invertebrate macrofossils are recommended at this stage, although the material might form a useful component of

a Research Council-funded project at a later date.

### Retention/disposal

On the basis of the comment above concerning possible further research work, it is recommended that the sediment is stored under safe, environmentally controlled conditions. The timber, although surviving remarkably well for a year in packaging without an excess of free water, will mostly need attention if it is to be retained for much longer.

### Archive

All processed material and paper and electronic archives relating to it are currently stored at the EAU, University of York.

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## Appendix 1: timber identifications

A total of 74 timber specimens was examined. They varied considerably in size, the smallest coming from branches of about 15 mm minimum diameter and the largest about 300 mm across, clearly from a large trunk or branch. No root wood was observed.

Preservation was rather variable, but it was nearly always possible to obtain a useable thin section with a hand-held single-sided razor-blade. In a few instances, the wood structure had so far degraded that identification was impossible and the tentative identifications in the table below were all instances when wood anatomy was characteristically 'collapsed' and the grain showed minute corrugation.

Almost all the wood was alder (*Alnus*, 73%), with a moderate number of specimens of ash (*Fraxinus*, 15%) and the remainder willow/?willow (*Salix*, 7%), hazel (*Corylus*, 3%) or unidentifiable (3%). The ring-porous ash was notable in that most of the ten specimens examined showed extremely narrow annual rings, characteristic of trees growing under adverse conditions (perhaps indicative of a rising water-table?).

*Table 1. Timber identifications for material from excavations at Skipsea Withow Gap.*

Timber	Sample	Identification	Notes
2002	530	<i>Alnus</i>	
2003	531	cf. <i>Salix</i>	very degraded
2004	532	cf. <i>Salix</i>	very degraded
2006	543	<i>Alnus</i>	
2007	546	<i>Alnus</i>	
2008	548	<i>Fraxinus</i>	very narrow rings
2009	550	<i>Alnus</i>	
2010	553	<i>Alnus</i>	
2011	551	<i>Alnus</i>	
2012	555	<i>Alnus</i>	
2017	617	<i>Alnus</i>	
2018	619	unidentifiable	most of sample = matrix; wood too crumbly
2019	615	<i>Alnus</i>	
2021	622	<i>Fraxinus</i>	
2022	621	<i>Salix</i>	
2023	620	<i>Alnus</i>	
2024	613	<i>Alnus</i>	
2026	603	<i>Corylus</i>	
2027	605	<i>Alnus</i>	
2028	609	<i>Alnus</i>	
2030	625	<i>Alnus</i>	
2031	610	<i>Alnus</i>	
2035	611	<i>Alnus</i>	
2036	612	<i>Fraxinus</i>	very narrow rings
2037	645	<i>Salix</i>	
2038	646	<i>Alnus</i>	
2039	647	unidentifiable	very degraded; rays (1)-2-(3) cells wide; heterogeneous; ?no scalariform plates or spiral thickenings
2040	648	<i>Alnus</i>	
2041	649	<i>Alnus</i>	
2042	650	<i>Alnus</i>	
2043	651	<i>Alnus</i>	
2044	652	<i>Alnus</i>	
2045	654	<i>Alnus</i>	
2046	655	<i>Alnus</i>	
2047	656	<i>Fraxinus</i>	very soft; extremely narrow rings
2048	653	<i>Fraxinus</i>	firm, but rings very narrow - almost invisible
2050	658	<i>Alnus</i>	
2051	659	<i>Alnus</i>	
2052	660	<i>Alnus</i>	

2053	657	<i>Alnus</i>	
2054	688	<i>Alnus</i>	
2055	687	<i>Alnus</i>	
2056	689	<i>Alnus</i>	
2057	690	<i>Alnus</i>	elbow-shaped
2058	691	<i>Alnus</i>	
2059	692	<i>Alnus</i>	
2060	699	<i>Alnus</i>	
2062	700	<i>Corylus</i>	
2066	698	<i>Alnus</i>	with an unusual green (copper-salt-like) colour
2068	705	<i>Fraxinus</i>	
2069	706	<i>Alnus</i>	
2070	707	<i>Alnus</i>	
2071	710	<i>Alnus</i>	
2072	711	<i>Alnus</i>	
2073	708	<i>Alnus</i>	
2074	709	<i>Alnus</i>	
2075	712	<i>Fraxinus</i>	
2076	714	cf. <i>Salix</i>	very degraded structure
2077	715	<i>Alnus</i>	
2078	713	<i>Alnus</i>	
2079	738	<i>Alnus</i>	elbow-shaped; angle about 100 deg.; scar on outside
2080	750	<i>Alnus</i>	
2081	749	<i>Alnus</i>	
2082	748	<i>Alnus</i>	
2083	746	<i>Fraxinus</i>	
2084	747	<i>Fraxinus</i>	
2090	792	<i>Fraxinus</i>	rather wider rings than other <i>Fraxinus</i> ; timber with at least one beetle exit hole and a small area of 'gallery'
2091	793	<i>Alnus</i>	
2092	795	<i>Alnus</i>	
2093	796	<i>Alnus</i>	
2094	797	<i>Alnus</i>	
2095	791	<i>Alnus</i>	
2096	798	<i>Alnus</i>	
2098	790	<i>Fraxinus</i>	rather wider rings than other material from this site

Timbers not found: 2035 (729), 2085 (771), 2086 (772), 2089 (786), 2097 (784), 2099 (788), 2100 (787)

**Appendix 2: Loss on ignition data**

Area/Context	Sample	Dry weight (g) (A)	Total weight after ignition (g) (B)	Crucible weight (g) (C)	Weight loss on ignition (g) (A-(B-C))	% weight loss on ignition	Mean % weight loss on ignition	Error in mean % (+/-)
<b>Area 1, Ser. 505</b>								
206 (clay)	513	10.0	23.7	14.9	1.2	12	14	2
		10.0	23.1	14.7	1.6	16		
207 (peat)	522	10.0	17.6	14.5	6.9	69	69.5	0.5
		10.0	18.0	15.0	7.0	70		
208 (peat)	557	8.5	16.4	14.1	6.2	73	75.5	2.5
		8.0	16.4	14.6	6.2	78		
208	643	9.2	18.5	15.0	5.7	62	63	1
		9.2	17.1	13.8	5.9	64		
213 (gyttja)	751	7.0	16.0	13.4	4.4	63	62	1
		7.0	17.2	14.5	4.3	61		
213	806	10.0	16.4	14.4	8.0	80	80.5	0.5
		10.0	16.9	15.0	8.1	81		
<b>Area 2, Ser. 565</b>								
209 (clay)	567	10.0	23.5	14.9	1.4	14	13	1
		10.0	23.2	14.4	1.2	12		
210 (peat)	569	10.0	24.4	19.1	4.7	47	48	1
		10.0	24.1	19.0	4.9	49		
212 (peat)	627	10.0	20.8	15.1	4.3	43	43	0
		10.0	19.7	14.0	4.3	43		
212	679	7.3	16.2	14.2	5.3	73	76	3
		6.8	20.4	19.0	5.4	79		
212	776	7.8	18.1	14.6	4.3	55	50.5	4.5
		9.0	19.8	14.9	4.1	46		

215 (sand)	778	10.0	23.4	14.4	1.0	10	9	1
		10.0	24.0	14.8	0.8	8		

**Addendum**

Some fragments of tooth recovered from the colluvial clay during excavation were identified as incisors of pig (probably *not* wild boar).

Det. AH, confirmed B. G. Irving.