



**Pye's Mill, Loddon to Nogdam End
Compartment 22
Broadland Flood Alleviation Project**


**Monitoring of Works under Archaeological
Supervision and Control**

ENF 131593

**Heather Wallis
November 2017**

HW Report No. 219





| | |
|---------------------|---|
| Project name | Loddon to Nogdam End, Compartment 22 |
| Parishes | Loddon and Heckingham |
| Event No. | ENF 131593 |
| Grid Refs | TM 3682 9908 to TG 3984 0074 |
| Date of Work | 28th May 2013 to 15th August 2015 |

Summary

This report includes details of two sites recorded during flood defence works along the River Chet. One, the waterlogged remains of a probable fish trap, was radiocarbon dated to the Middle Saxon period. The other was the remains of a brick-built culvert within the old flood bank. A review of map evidence suggested that this was constructed in the late 19th or very early years of the 20th century.

Introduction

Planning permission was granted to Halcrow Group Ltd, for flood alleviation work along the right bank of the River Chet between Pye's Mill and Nogdam End (Fig. 1). This development formed part of the Broadland Flood Alleviation Project, a major project which has renewed and strengthened flood banks along the Rivers Bure, Ant, Thurne, Yare, Chet and Waveney.

A condition of the permission required an archaeological watching brief to be carried out during the construction works.

This report covers monitoring works associated with planning application BA/2013/0061.

The Works

Works were undertaken along c.4.2km of the right bank of the River Chet. Old dykes were backfilled and new dykes, up to 18m wide and c.2m deep, were excavated. Material from these excavations was used to strengthen the flood bank.

Geology

The bedrock geology of eastern Norfolk consists of Crag Group sand and gravel. This sedimentary material is made up of marine and estuarine sands, gravels, silts and clays deposited up to 5 million years ago. The superficial geology is Breydon Formation peat, silts and clays. The peat can be of

freshwater or brackish origin and forms inconsistent layers interspersed with silts and clays. Peat is the dominant element along most of the Chet valley, although silts and clays are found close to the River Chet's confluence with the River Yare. (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

Archaeological Background

Prior to works commencing a desk top assessment of the area was undertaken (Halcrow Group Ltd 2013). This identified all known sites of archaeological interest which may have been affected by the flood defence works, and a mitigation strategy was formulated to limit the impact of the works on these sites. Within the bounds of the Compartment a total of 26 records were returned from a search of the Norfolk Historic Environment Record. Only one site lay in the works corridor, this being the finds spot for an almost complete medieval jug. The remainder of the recorded archaeological sites lay on the rising slopes of the shallow Chet valley. Known archaeological sites are more frequent beyond the bounds of the Compartment as the ground level rises above the 5m contour.

The parishes of Loddon, Heckingham and Hales were subject to a fieldwalking survey undertaken between 1980 and 1985 (Davison 1990) so the number of recorded artefacts in this area is higher than in many other parts of Norfolk. This is particularly notable when compared to the adjacent parish of Norton Subcourse. Since the survey further sites have been identified through the study of aerial photographs as part of the National Mapping Programme.

In summary, within the Compartment, finds of Neolithic flints are few, while there are no sites dating to the Bronze Age or Iron Age. A possible Romano-British settlement has been identified around Church Farm, Heckingham. During the Early and Middle Saxon periods the evidence for settlement in the area increases with continued occupation at Church Farm and further occupation at Riverside Farm, Loddon. The area around Church Farm continued to provide evidence of settlement into the Late Saxon and Medieval periods. Evidence for activity in the area became more widespread during the medieval period, with the number of sites then reducing into the late medieval and post-medieval periods.

Aims of the work

The watching brief was intended to identify and record any previously unknown sites as well as record any known remains which were disturbed by the works. Advice was also given where necessary to reduce the impact of the works on any archaeological deposits.

Watching Brief Methods

Regular visits were made to the site throughout the course of the excavations. Each area of machine works was visited on an approximately weekly basis, the

exact frequency varied, depending on the speed of progress of the works. Where possible a visual scan was made of areas when the topsoil strip had been completed in order to identify any archaeological deposits. Similarly, the sides of the new soke dykes were visually assessed to identify and record any features which may have been revealed. Monitoring was undertaken from the top edge of the new dykes as safety concerns prevented access into the new dyke.

Additionally, more frequent visits and systematic metal-detecting was undertaken where works were carried out close to sites where finds had previously been retrieved.

Site staff were briefed on the possibility of revealing archaeological deposits and were encouraged to report any artefacts or unusual deposits which they encountered.

All work was carried out in full accordance with national and regional guidelines for the treatment of archaeological remains, and in particular the guidance set out in *Standards for Field Archaeology in the East of England* (Gurney 2003) and the Institute of Field Archaeologists *Standard and Guidance for an Archaeological Watching Brief* (2010).

Records of the watching brief consist of a site diary and digital photographs. Where archaeological sites were identified full recording was undertaken using single context recording, with plans and sections drawn at appropriate scales, and black & white photographic negatives.

Results of the Monitoring Works

Four sites were recorded during the course of the construction works; a post-medieval brushwood site, an early medieval clinker-built boat, a Middle Saxon fish trap and a post-medieval brick culvert. The first two of these discoveries were subject to excavation and are reported on in full elsewhere, while the latter two sites are detailed below.

The underlying geology as observed during the works was predominantly peat, changing to silts and clays at the downstream end of the works.

Sites are described south-west to north-east. Chainage is included for ease of reference to drawings held in the archive.

Medieval Clinker Boat

TM 37273 99164

Chainage 1250

HER Event No. ENF132081

For details see Wallis in prep a. Assessment Report

Post-medieval Brushwood Site

(for details see Wallis in prep a Assessment Report)

TM 37403 99199

Chainage 1390

HER Event No. ENF131927

For details see Wallis in prep a. Assessment Report

Brick Culvert

TM 39043 99786

Chainage 3350

Located within the existing flood bank a brick culvert was disturbed by the works (Plates 1 and 2). A photographic record of both colour digital and black and white negatives was made of this feature before it was buried within the new flood bank. Access to the culvert for more detailed recording was not possible due to the unsafe ground conditions. The damage observed on the plates occurred during the construction works.



Plate 1. Brick culvert, looking north-west, scale 1m.

The culvert was totally encased within the bank and only its southern face was observed, this was made up of a vertical brick façade with straight, splayed arms to each side. The culvert appeared to be constructed as a barrel vault. The bricks used in construction were made of fine sandy clay, hard fired to an orange/red colour and set in a hard, white mortar. It appeared to be of a single-phase construction with no later alterations or repairs. This culvert linked the dykes and nearby ponds to the River Chet.



Plate 2. Brick culvert, looking north-west, scale 1m.

Maps of the area available on-line (Norfolk Map Explorer and National Library of Scotland) have been examined. Both the Inclosure map (1820s) and Tithe map (Heckingham 1838) show an open channel joining the Chet at the location of the culvert (Plate 3). This channel appeared to link two ponds, described as medieval fishponds on Norfolk Historic Environment Record (HER No. 23460), to the river. Three sides of a moat associated with a Hall are also visible a short distance to the north-east (HER No. 10529).



Plate 3. Tithe Map 1838

(<http://www.historic-maps.norfolk.gov.uk/mapexplorer/>)

By the time the 1st Edition Six Inch Ordnance Survey map (1884) was surveyed a flood bank had been constructed and the open channel narrowed to a dyke (Plate 4). The moat and site of Old Hall are noted.

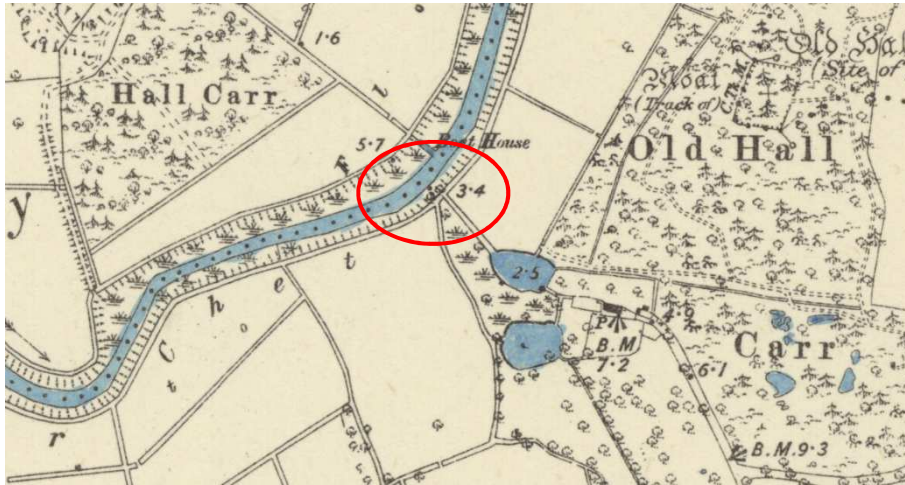


Plate 4. 1st Edition Ordnance Survey Map 1884

<http://maps.nls.uk/view/101583806>

The Ordnance Survey Six Inch map revised in 1905 and published in 1908 shows the narrowing of the flood bank indicating that a channel passed under the bank at this location (Plate 5). The recorded culvert therefore, dates to between 1884 and 1905.



Plate 5. 2nd Edition Ordnance Survey Map 1905

<http://maps.nls.uk/view/101583803>

Fish trap

TG 39715 00745 (with 3m accuracy)

Chainage 4900

During the construction works one of the machine drivers noted small fragments of waterlogged wood in the base of the excavation and alerted the monitoring archaeologist to the discovery. Access to the dyke was not possible due to Health and Safety concerns, and the *in situ* remains were very ephemeral, but some of the pieces of wood were retrieved from the excavated spoil. Samples of the pieces of wood were submitted to Steve Allen at York Archaeological

Trust for species identification and comment (Allen 2017), a further sample was sent to Beta Analytic for radiocarbon dating (Appendix 1).

The date returned for the wood was

Cal AD 640 to 680 (95% probability)

All three samples of wood submitted were of the same species, hazel, had eleven or twelve annual rings and were winter felled (Appendix 2). As this site was located close to the River Chet's confluence with the Yare the underlying geology consisted of silts and clay, not peat as observed further upstream in the Chet valley.

Similarity to other discoveries has led to this being interpreted as a fish trap. Two of the other fish traps recorded during the Broadland Flood Alleviation Project were located relatively close by on the Chet (Compartment 22 Nogdam End ENF136420, Wallis 2017) and the Yare (Compartment 12 HER 52921, Wallis in prep. b) and another example was recorded further north on the River Bure (Compartment 10 HER 50572, Wallis in prep. c).

Conclusions

Monitoring of works in this Compartment revealed four sites, including an early medieval clinker-built boat and a post-medieval brushwood site (both reported on elsewhere). Elements of a probable fish trap which has been dated to the Middle Saxon period were observed. This is one of three such discoveries in the immediate locality the others being located c.500m to the north-west and c. 1.5km also to the north west. All have been radiocarbon dated to the Middle Saxon period. It is therefore apparent that although Middle Saxon settlement was restricted to higher ground beyond the river valleys and marshes, the natural resources of the rivers were exploited at this time.

Also recorded was the remains of a late 19th century or early 20th century brick-built culvert. This extended through the flood bank linking the marshland system of dykes to the river. Examination of map evidence has shown how an open channel linking possible medieval fish ponds to the river became straightened into part of the managed dyke system between the mid and late 19th century with the culvert being added a few years later.

The archaeological monitoring works have therefore proved to be most fruitful, identifying sites of Middle Saxon, early medieval and post-medieval date.

Bibliography

- Allen, S.J., 2017 Species identifications of Wood Samples from C22 Watching Brief. York Archaeological Trust Conservation Laboratory Report No. 2017/43
- Davison, A., 1990 The Evolution of Settlement in Three Parishes in South-East Norfolk, *East Anglian Archaeology* 49.
- Halcrow Group Ltd, 2013, Broadland Flood Alleviation Project Compartment 22, Pyes Mill to Nogdam End. Environmental Statement.
- Wallis, H., 2017 Nogdam End, Compartment 22 Broadland Flood Alleviation Project. Monitoring of Works under Archaeological Supervision and Control. HW Report No. 206.
- Wallis, H., in prep. a River Chet Brushwood Site and Clinker Boat Compartment 22 Broadland Flood Alleviation Project. Archaeological Assessment and Updated Project Design Assessment Report. HW Report No. 196
- Wallis, H., in prep. b Limpenhoe Marshes, Compartment 12 Broadland Flood Alleviation Project. Monitoring of Works under Archaeological Supervision and Control. HW Report No. 220.
- Wallis, H., in prep. c Stokesby to West Caister, Compartment 10 Broadland Flood Alleviation Project. Monitoring of Works under Archaeological Supervision and Control. HW Report No. 222.

Acknowledgements

My thanks go to all those involved with the project at Halcrow and BamNuttall who were helpful and vigilant throughout the works. The waterlogged wood was reported on by Steve Allen (York Archaeological Trust) and radiocarbon dating was carried out by Beta Analytic (Miami, USA).

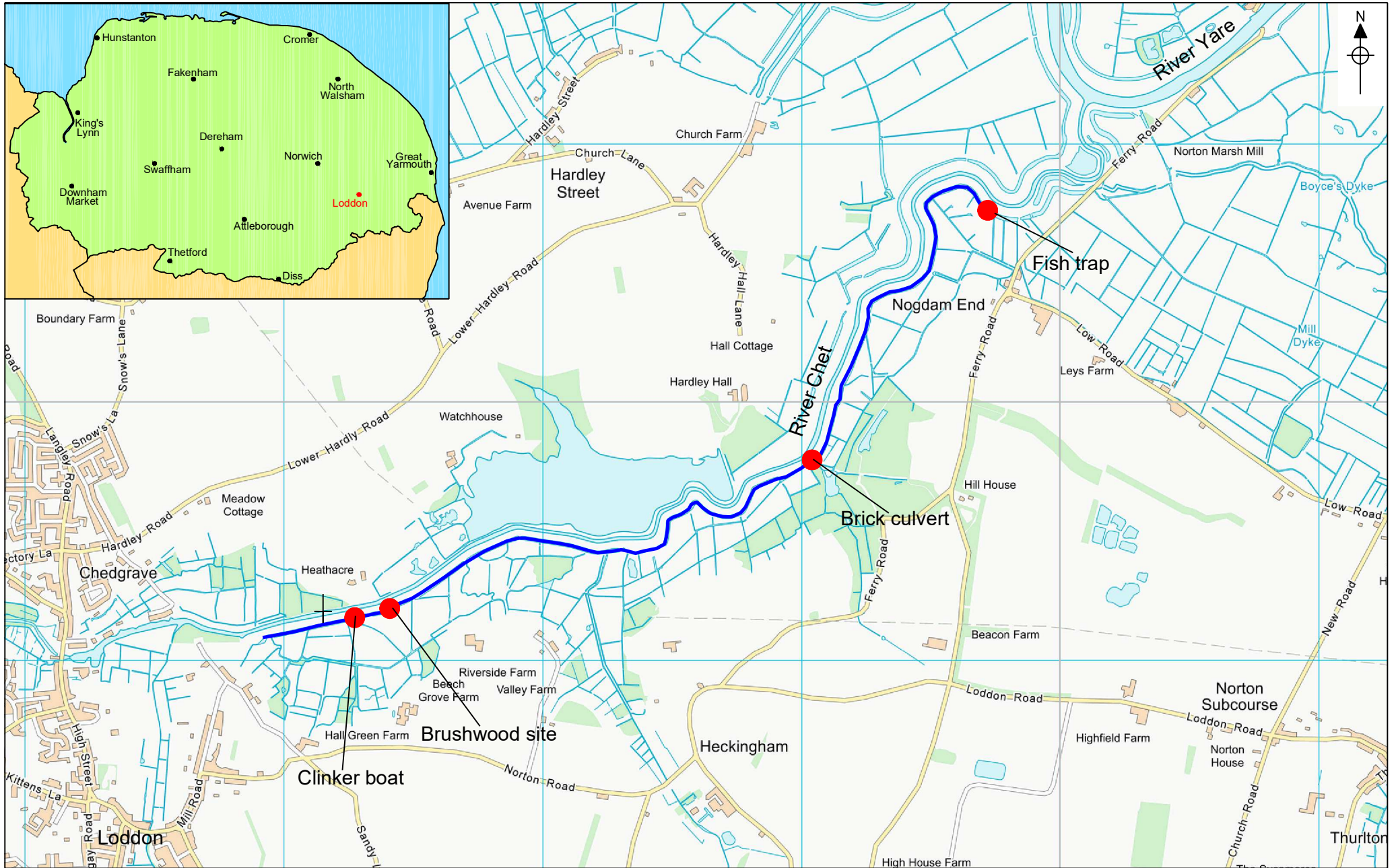


Figure 1. Site location showing line of works (blue) and sites (red).

Appendix 1

Radiocarbon Dating



Beta Analytic Inc.
DR. M.A. TAMERS and MR. D.G. HOOD

4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX: 305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Ms. Heather Wallis

Report Date: 12/14/2016

Material Received: 11/28/2016

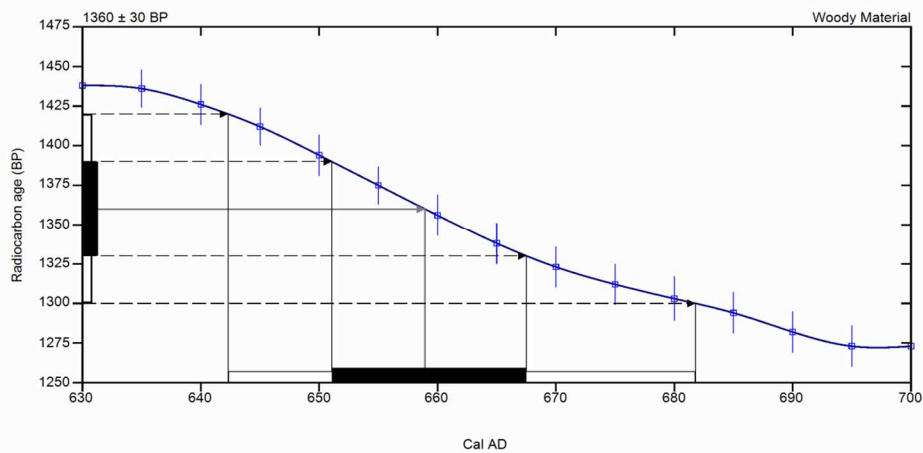
| Sample Data | Measured Radiocarbon Age | Isotopes Results o/oo | Conventional Radiocarbon Age |
|--|--------------------------|-----------------------|------------------------------|
| Beta - 451568 SAMPLE: 131593/4 ANALYSIS: AMS-Standard delivery MATERIAL/PRETREATMENT: (wood): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 640 to 680 (Cal BP 1310 to 1270) | 1370 +/- 30 BP | d13C= -25.6 | 1360 +/- 30 BP |

Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" is corrected for isotopic fraction and was used for calendar calibration where applicable. The Age was calculated using the Libby half-life (5568 years), is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the 14C signature of NIST SRM-4990C (oxalic acid). Quoted error is 1 sigma of counting error on the combined measurements of sample, background and modern reference. Calculated sigmas less than 30 years are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C) and are reported in per mil relative to VPDB-1. Applicable calendar calibrated results were calculated using INTCAL13, MARINE13 or SHCAL13 as appropriate (see calibration graph report for references). Applicable d15N values are relative to VPDB-1 and applicable d18O and dD values are relative to VSMOW. Applicable water results are reported without correction for isotopic fractionation.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -25.6 o/oo : lab. mult = 1)

| | |
|---|---|
| Laboratory number | Beta-451568 : 131593/4 |
| Conventional radiocarbon age | 1360 ± 30 BP |
| Calibrated Result (95% Probability) | Cal AD 640 to 680 (Cal BP 1310 to 1270) |
| Intercept of radiocarbon age with calibration curve | Cal AD 660 (Cal BP 1290) |
| Calibrated Result (68% Probability) | Cal AD 650 to 670 (Cal BP 1300 to 1280) |



Database used
INTCAL13

References

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database

Reimer PJ et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887., 2013.

Beta Analytic Radiocarbon Dating Laboratory

4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • Email: beta@radiocarbon.com

Appendix 2**Species Identifications of wood****Steve Allen**

| Sample No. | Description | Species Id. |
|-------------------|---|----------------------------|
| (01) | Roundwood stake point, no bark present. 12 annual rings, winter felled. | <i>Corylus avellana L.</i> |
| (02) | Roundwood stake point, no bark present. 12 annual rings, winter felled. | <i>Corylus avellana L.</i> |
| (03) | Section of roundwood partial bark present. 11 annual rings, winter felled. | <i>Corylus avellana L.</i> |

Botanical identification Common English name
Corylus avellana L. Hazel

OASIS DATA COLLECTION FORM: England

[List of Projects](#) | [Manage Projects](#) | [Search Projects](#) | [New project](#) | [Change your details](#) | [HER coverage](#) | [Change country](#) | [Log out](#)

Printable version

OASIS ID: heatherw1-151313

Project details

| | |
|--|--|
| Project name | Compartment 22 River Chet, Loddon to Nogdam End |
| Short description of the project | Monitoring of flood defence works along the River Chet revealed four sites, two of which were excavated and are detailed in other OASIS entries. One of the other sites was the waterlogged remains of a probable fish trap which was radiocarbon dated to the Middle Saxon period. The other was the remains of a brick-built culvert within the old flood bank. A review of map evidence suggested that this was constructed in the late 19th or very early years of the 20th century. |
| Project dates | Start: 28-05-2013 End: 15-08-2015 |
| Previous/future work | No / No |
| Any associated project reference codes | ENF 131593 - HER event no. |
| Any associated project reference codes | 154947 - OASIS form ID |
| Any associated project reference codes | 154953 - OASIS form ID |
| Type of project | Recording project |
| Monument type | FISHTRAP Early Medieval |
| Monument type | CULVERT Post Medieval |
| Significant Finds | NONE None |
| Investigation type | "Watching Brief" |
| Prompt | Planning condition |

Project location

| | |
|------------------|--|
| Country | England |
| Site location | NORFOLK SOUTH NORFOLK HECKINGHAM River Chet Flood Defences, Loddon to Nogdam |
| Study area | 5 Kilometres |
| Site coordinates | TM 3682 9908 52.537446244394 1.492528806094 52 32 14 N 001 29 33 E Line |
| Site coordinates | TM 3984 0074 51.653552222412 1.46777241226 51 39 12 N 001 28 03 E Line |

Project creators

| | |
|---------------------------|---|
| Name of Organisation | Heather Wallis |
| Project brief originator | Local Authority Archaeologist and/or Planning Authority/advisory body |
| Project design originator | Heather Wallis |
| Project director/manager | Heather Wallis |
| Project supervisor | None |

Project archives

| | |
|---------------------------|---|
| Physical Archive Exists? | No |
| Digital Archive recipient | Norfolk Museums Service |
| Digital Contents | "Stratigraphic" |
| Digital Media available | "Images raster / digital photography","Text" |
| Paper Archive recipient | Norfolk Museums Service |
| Paper Contents | "Stratigraphic" |
| Paper Media available | "Notebook - Excavation',' Research',' General Notes',"Report" |

Project bibliography 1

| | |
|-------------------------------|---|
| Publication type | Grey literature (unpublished document/manuscript) |
| Title | Pye's Mill, Loddon to Nogdam End. Compartment 22 Broadland Flood Alleviation Project. Monitoring of Works under Archaeological Supervision and Control. |
| Author(s)/Editor(s) | Wallis, H. |
| Other bibliographic details | HW Report No. 219 |
| Date | 2017 |
| Issuer or publisher | H Wallis |
| Place of issue or publication | Norwich |
| Entered by | Heather Wallis (archaeology@hwallis.co.uk) |
| Entered on | 13 November 2017 |

OASIS:

Please e-mail Historic England for OASIS help and advice

© ADS 1996-2012 Created by [Jo Gilham and Jen Mitcham](#), email Last modified Wednesday 9 May 2012

Cite only: <http://www.oasis.ac.uk/form/print.cfm> for this page