

The value of (palaeo)ecology to archaeology and the Historic Environment

Kirsty High ^a and Zoë Hazell ^b

 @KirstyHigh @ZedHazell

^a: Department of Chemistry, University of York, Heslington, York; Kirsty.high@York.ac.uk
^b: Historic England, Fort Cumberland, Portsmouth, Hampshire; Zoe.Hazell@HistoricEngland.org.uk

Archaeological – Palaeoecological – Ecological connections in wetlands

The waterlogged conditions that make wetland sites so important in terms of modern ecology also result in the **exceptional preservation** of organic deposits at depth.

These organic materials include **organic archaeology** and **palaeoecological remains** that are rarely found elsewhere. The value of this evidence in reconstructing past economies, landscapes and environmental conditions **cannot be underestimated**.

The **close connections** between the Archaeological – Palaeoecological – Ecological communities are particularly evident at wetland sites, where the quality and abundance of organic remains present many **opportunities** to explore and develop interdisciplinary relationships.



Meadowsweet (*Filipendula*) pollen (© Global Pollen Project)



Iron Age charred grain at Must Farm



Tephra (volcanic ash) sherds (© Z Hazell)



Sordaria sp. dung fungal spore indicative of grazing animals (© M Perez)

Case study 1: The Somerset Levels

There are at least 53 prehistoric sites in Somerset's peat moors, as well as the associated record of Holocene climate change¹.



A reconstruction of the Sweet Track, located at Shapwick Heath, Somerset. Excavations have revealed various artefacts as well as palaeoecological data.

The Sweet Track is a 2 km-long Neolithic trackway, linking places within the prehistoric landscape. Integrated archaeological and palaeoecological study of the track has revealed a wealth of information about human interactions with the environment during the Neolithic period².

Integrated environmental investigations at Glastonbury Lake Village allowed reconstruction of the environment surrounding the settlement. Variations in water levels have been identified, enhancing understanding of why the site was abandoned³.



Iron Age 'Glastonbury Lake Village' was initially excavated c.1900; exposure of the waterlogged wood remains will have affected their long term condition (© Historic England).

Intensive land drainage and peat cutting in Somerset pose an immediate threat to the cultural deposits. A 500m section of the Sweet Track is now preserved within a nature reserve created primarily for this reason, transforming old peat cuttings into reedbeds.



Left: Deteriorated antler excavated from Star Carr; a site once yielding a wealth of well-preserved archaeological and environmental evidence. Deterioration was caused by land drainage^{9,10}.



Right: Sedge Fen (part of Wicken Fen) is elevated above the surrounding water-table. In order to prevent it drying out, an artificially-high water-table is maintained by pumping water from Monk's Lode. An impermeable membrane helps minimise seepage. Water chemistry is equally important; the pumped water is calcareous, thereby preventing acidification of the site (from acidic rainwater) (© Z Hazell).



Above: In 2017 dipwells were installed at Flag Fen to monitor the water-table. A condition assessment of the organic remains (incl. wood) will establish a baseline value (© Historic England).

Case study 2: Whitehorse Hill, Devon

In 2011 emergency excavations were carried out on a Scheduled Bronze Age cist, eroding out of a **blanket peat** face at Whitehorse Hill⁴.

Preserved within the chamber were the remains of a cremation burial consisting of **artefactual** and **archaeo-environmental** remains. They included human bone and wood charcoal from the cremation itself, together with flints, beads, worked wood, and basketry; some of which were wrapped up within a bear pelt.



The eroding burial cist and adjacent sampled peat profile at Whitehorse Hill c 600m OD (North Dartmoor SSSI) (© Historic England).



A selection of artefacts from the burial. The spindle-wood artefacts are the earliest evidence of wood-turning in the British Isles (© DNPA).

Multiple analyses were undertaken including: pollen, micro-charcoal, fungal spores and plant macrofossil remains. A chronology was produced using radiocarbon dating and tephra. Pollen recovered from sediments in the cist itself suggest the use of meadowsweet as a floral tribute and also provide an indication of seasonality.

In order to investigate the environmental setting of the burial chamber at the time of its construction, a series of samples were taken from the peat deposit immediately adjacent to the cist.

Case study 3: Wicken Fen, Cambridgeshire

As part of a Historic England project, Wicken Fen was identified as one of England's top 'Exceptional wetland heritage' sites^{5,6} selected for its diverse and interesting mix of values. These include:

Historical: It was Britain's 'first nature reserve', created on land purchased by Octavia Hill in 1899; pioneering British natural history research was undertaken here (e.g. Godwin, Tansley).

Heritage landscape: A relict landscape, with a history of traditional management practises e.g. peat cutting for fuel; sedge and reed cultivation; canals; water management; hunting.

Ecological: There is a very high degree of modern biodiversity, incl. rare and/or endangered species; as such it has multiple nature conservation designations incl. NNR, SSSI, and Ramsar.

Palaeoecological: Palaeoenvironmental records and radiocarbon dates have been obtained from the peat deposits^{7,8}.

Amenity value: The site has a high level of importance for recreation and educational use. The site requires constant **active management**; of the hydrology (water pumping, ditch de-silting) and through vegetation clearance (e.g. by grazing).



Normans Mill, a Grade II listed wind pump; originally used to drain peat digging works, but now (re-located) and used to pump water onto the fen (© Z Hazell).

Wetland cultural deposits at risk

These valuable archives are preserved primarily due to a lack of oxygen; as such they are **vulnerable** to environmental changes, particularly desiccation^{1, 10}. However, the risks to the archaeological and palaeoenvironmental archive are often over-looked when managing wetlands from an ecological perspective, despite the common desire for long term preservation.

Better integration between the three communities, and better understanding of the processes involved in deterioration, is vital in developing approaches that protect both cultural heritage and ecological considerations in wetlands. Recognising the importance of the shared values, and connections between the three research communities highlights the need to **better protect** these unique resources in the face of environmental change.

References 1: Brunning, R. 2012. *Conservation MGMT of Arch. Sites* 14:1-4; 2: Brunning, R. 2013. *Somerset's Peatland Archaeology*, Oxbow books; 3: Aalbersberg, G. & Brown, T. 2011. *J Wetland Arch.* 10: 136-151; 4: Jones, A. 2017, *Current Archaeology* 322:34-40; 5: Heathcote, J. & Campbell, G. 2013. *Historic England Research Report* 85/2013; 6: Hazell, Z. 2014. *Wicken Fen: Statement of Significance*; Historic England; 7: Godwin, H. 1940. *Phil. Trans. R. Soc. Lond. B* 230: 239-303; 8: Peglar, S. 1994, in *East Anglian Archaeology* 70:114-118; 9: Milner, N. et al., 2011. *J Arch. Sci.* 38:2818-2832; 10: High, K. et al., 2016. *PNAS* 10:1073



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