

<b>Institution: University of Reading</b>
<b>Unit of Assessment: 17A Geography, Environmental Studies &amp; Archaeology: Archaeology</b>
<b>Title of case study: Enhancing heritage management and capacity building in European wetland archaeology</b>
<b>1. Summary of the impact</b>
Research carried out by the University of Reading's Martin Bell and Nicholas Branch on previously neglected wetland environments (such as coasts, floodplains and mires) has had impact in two main areas:
1) <b>Heritage management:</b> The work has made a major contribution to the sustainable management of marginal environments in the face of climate change and development pressures. This has directly affected local planning processes, with Bell and Branch's approaches to monitoring and recording adopted as best practice by a range of organisations.
2) <b>Capacity building of geoarchaeology in the commercial sector:</b> The research has enhanced the capability of organisations to respond effectively to the challenges of interpreting European wetland archaeology in advance of development pressures. Knowledge transfer of the research to these commercial units has contributed to sustained economic growth for such organisations.
<b>2. Underpinning research</b>
Bell and Branch investigate archaeological and palaeoenvironmental records from lowland wetlands on a wide range of scales (coasts, floodplains, mires and moats). These provide important information on the interaction between human communities and their environments during the present interglacial (Holocene) epoch. The research has helped to transform the understanding of past human activities and their relationship to environmental change. Through the development and implementation of new field and laboratory methodologies, Bell and Branch explore long-term and rapid climate change, changes in relative sea level, natural vegetation succession, human impact on the vegetation cover and land use, peatland formation and expansion, and human utilisation of a broad range of natural resources.
This long-term programme of research at the University of Reading was initiated by Bell in the 1990s (with J.R.L. Allen and M.G. Fulford), and focused on the coastal zone of western Britain. In 2008, the appointment of Branch led to a considerable expansion of the research programme to include natural (e.g. floodplains and mires) and artificial (e.g. moats) lowland, inland wetlands in southeast England, France and Ireland. Branch and Bell have ensured wider dissemination of the wetland research by creating Quaternary Scientific (Quest), a research-led enterprise unit that has successfully transferred expert knowledge and methodologies to local authorities and the commercial archaeological sector.
<b>Research in coastal areas</b>
The key research undertaken in coastal areas has been the Severn Estuary prehistory project led by Bell, which has revealed an 8,000-year intertidal sedimentary sequence with many stratified archaeological sites and has subsequently developed new techniques for intertidal geoarchaeological survey and excavation. Major discoveries include Mesolithic settlements with organic evidence and human and animal footprint-tracks, advancing knowledge of Mesolithic coastal exploitation, plant use and seasonality. The research has also identified episodic cyclical changes in the coastal environment on timescales ranging from days to millennia, which have significant implications for long-term coastal zone management. The discoveries and methods adopted have informed Cadw (the Welsh Government's historic environment service) and English Heritage strategies for coastal zone management; the development of nature reserves (Newport Wetlands and Somerset Levels); and led to the monitoring of internationally important wetland sites at risk from environmental change (see Section 4.1 below). In 2013, Bell and Branch (with Quest) were commissioned by English Heritage to investigate the Mesolithic Wetland Edge of Somerset.
<b>Research on floodplains and mires</b>
The key research on floodplains and mires has been the Thames Valley and Seille Valley (France) projects led by Branch, which have investigated a series of alluvial and peat sequences, and their Neolithic, Bronze Age, Iron Age and Roman archaeology. Spanning 6,000 years, the research concluded that changes in vegetation cover (e.g. yew) and sedimentation were at various times triggered by human activities, sea-level change, rapid climate change and disease. The findings have made an important contribution to wetland research and informed methodological

approaches to geoarchaeological investigations, especially the routine use of multiple proxies (comparative studies using a range of sources of evidence). This approach has facilitated a more comprehensive reconstruction of past environments and human activities and the application of sediment-based stratigraphic modelling to reconstruct and predict zones of human activity.

**3. References to the research** Publications, and grant applications from which they result, were subject to peer review. Publications have internally assessed of at least 2\* quality. Publications marked \* we submitted to the REF or previous RAEs

\*Bell, M., Caseldine, A., and Neumann, H. (2000) *Prehistoric intertidal archaeology in the Welsh Severn Estuary*. York: Council for British Archaeology Research Report 120.

\*Bell, M. (2007) *Prehistoric coastal communities: the Mesolithic in western Britain*. York: Council for British Archaeology Research Report 149.

\*Branch, N., Batchelor, R., Cameron, N., Coope, R., Densem, R., Gale, R., Green, C. and Williams, A. (2012) Holocene environmental changes in the Lower Thames Valley, London, UK: implications for understanding the history of Taxus (L.) woodland. *The Holocene*, 22, 1143-1158.

\*Riddiford, N., Branch, N., Green, C., Armitage, S. and Olivier, L. (2012) Holocene palaeoenvironmental history and the impact of prehistoric salt production in the Seille Valley, Eastern France. *The Holocene*, 22, 831-845.

\*Bell, M. (2013) *The Bronze Age in the Severn Estuary*. York: Council for British Archaeology Research Report 172.

Bell, M. (2013) Intertidal survey and excavation. In: Menotti, F. and O'Sullivan, A. (eds.) *Oxford Handbook of Wetland Archaeology*. Oxford: Oxford University Press, 457-471

#### Grants for Severn Estuary wetland research:

Name of principal investigator: Prof M. Bell

Sponsor: NERC

Title: Mesolithic to Neolithic Coastal environmental change; NER/A/S/2000/00490

Dates: 2000-2003

Value: £169,202

Name of principal investigator: Prof M. Bell

Sponsor: British Academy

Title: (BARR0305)

Dates: Academic Years 2003-4 and 2004-5

Value: £55,000

English Heritage (4G1.301/6624- £69.3k, 2013-2014); Cadw (Goldcliff, Redwick and Peterstone projects- £97.2k, 1999-2010); AHRC/ EPSRC (CDA08/428- £55k, 2008-2011)]. Full details available upon request

Total £456,194 for 1999-2013.

#### **4. Details of the impact**

The impact of Bell and Branch's research can be summarised under two headings: heritage management and impact on economic growth in commercial archaeology.

##### (4.1) Heritage management

Prior to c.1990, development pressures in lowland wetlands, especially coasts and the intertidal zone, received little archaeological attention by planning authorities, since these areas were largely blank with respect to the distribution of known archaeological sites. Today, informed by geoarchaeological research to which the University of Reading has made a major contribution, planning authorities increasingly require extensive archaeological intervention in advance of development (see section 4.2 below). The research by Bell and Branch on wetland geoarchaeology has influenced the official policies and activities of a range of stakeholders, especially local planning authorities (e.g. Somerset County Council) and heritage agencies. A number of specific examples can be highlighted:

##### **Planning and management:**

- The research impacted on national management strategies for coastal areas (e.g. 'Mesolithic Maritime Research Framework' [Bell *et al*, 2013]).

##### *Testimonial:*

"Publication of the survey of the Welsh intertidal zone contributed directly to the development of a national programme of coastal surveys" (English Heritage, 12 June 2013).

- Specific examples of impact on the planning process include the M4 relief road scheme

(dropped in 2009 partly on archaeological grounds) and the Severn Tidal Power Scheme

*Testimonials:*

“Responses to consultations....rely on the excellence of the information base to which Reading research has made such a valuable contribution” (English Heritage, 12 June 2013).

The University of Reading’s work is seen as “invaluable when forming evaluation and mitigation strategies for major coastal infrastructure projects” (Somerset County Council, May 2013).

- The participation of Bell and Branch on advisory panels with a significant wetland and coastal archaeological interest has contributed to planning and management strategies (e.g. English Heritage Advisory Committee [Bell to 2010], Trustee and Director of Wessex Archaeology [Bell to 2011], Surrey County Council (SCC) Archaeology Strategy Group and SCC Sub-group for Environmental Archaeology [Branch to present]).
- Raised media attention of wetland archaeology has had a beneficial effect on national management strategies. The research featured nationally and internationally in the REF period, in for example Channel 4 programme *Time Team* (2013), BBC Two’s *History of Ancient Britain* (2011) and *National Geographic* magazine (2012). In a testimonial, Cadw refers to the benefits of raised media attention by Bell “based on 20 years of patient and pioneering research” (28 March 2013).

**Best practice in geoarchaeology**

- The development of techniques of rapid survey and recording in intertidal areas has influenced best practice in geoarchaeology as articulated in *Intertidal survey and excavation* (Bell in Menotti and O’Sullivan, 2012).

*Testimonials:*

“Nearly everybody embarking on research within tidal estuaries uses the Severn as a model of how to carry out integrated and interdisciplinary research that you have helped to pioneer.”

(Cadw, 28 March 2013)

“Your CBA reports now provide a benchmark for our own response to wetland zone archaeology.... Your work has raised awareness within the heritage sector of the significance and future potential of wetland and intertidal archaeology.”

(National Museums of Wales, 4 April 2013)

- Branch and Bell’s research contributed to geoarchaeological aspects of Regional Research Frameworks and guidelines, which provide guidance to the public and private sectors on the management, protection and research of heritage assets. In particular, their work contributed to *The Archaeology of South West England: South West Archaeological Research Strategy* (2012), and the *English Heritage Environmental Archaeology Guide 2<sup>nd</sup> edition*, case study (2011).
- The impact extends beyond the UK, with agencies in Ireland (e.g. Irish Heritage Council and Archaeological Development Services Ltd.) and France (e.g. National Museum of Archaeology, Paris) implementing approaches developed by Branch (Riddiford et al. 2012) on major national projects – e.g the Bord na Móna Peatland Survey (Ireland) and Projet Briquetage de la Seille (France).

**(4.2) Impact on commerce and economic growth in commercial archaeology**

The research of Bell and Branch is characterised by the development of new, innovative approaches to geoarchaeological field and laboratory work within wetland environments. The dissemination of the research to the commercial sector has had an outstanding impact by enhancing the capability of commercial bodies to undertake geoarchaeological investigations leading to sustained economic growth for these organisations.

Two private-sector areas in particular have benefitted: (a) environmental consultancies (e.g. CgMs Consulting), and (b) archaeological businesses (e.g. Pre-Construct Archaeology Ltd). The increased input of research-led geoarchaeology has informed commercial project designs, fieldwork, post-excavation analyses and publication texts and has enabled private companies to “tender for and win projects of greater complexity and size than would otherwise have been the case” (Pre-Construct Archaeology Ltd testimonial, 26 April 2013).

A number of specific examples of the commercial and economic benefits of the research can be highlighted:

- Commercial archaeology technical reports drawing upon the research (e.g. Branch et al. 2012) include research strategies, approaches to field sampling to provide multi-proxy records of

environmental change and human activity, and laboratory-based analytical procedures and data analysis (including 2D and 3D sedimentary modelling and the innovative application of a range of geoarchaeological techniques). Major development projects in London, such as the London Cable Car and the Erith Wind Turbine highlight the research's outstanding contribution to the private sector and the rapid transfer of the work through the direct commercial engagement of organisations with Quest, as demonstrated by the following testimonial: "Quest's refined modelling of the geoarchaeological deposits in London has enabled...advisors to tailor archaeological conditions ensuring that mitigation requirements on development are both reasonable and proportionate, key requirements of National Planning Policy" (English Heritage 12 June 2013).

- Enhanced income generation for the environmental consultancies and archaeological businesses by the transfer of research-led geoarchaeological knowledge and expertise has enabled them to tender for commercial contracts as part of the planning process, from which they would otherwise have been excluded. Examples of additional income for these businesses from purely wetland geoarchaeological project work in 2008-2013 are: CgMs Consulting [UK] (~£193K), AOC Archaeology [UK] (~£179K), Pre-Construct Archaeology Ltd (~£154K), Amelie [France] (~£107K), and Archaeological Development Services Ltd [Ireland] (~£90K).
- By providing this research-led enterprise service, Quest has become a sustainable technical service facility employing five full-time members of staff and with a total turnover during the REF impact period in excess of £1m. Quest has therefore created and sustained jobs, and improved the career development profiles of its staff by actively involving them in academic publications (e.g. Hornchurch Marsh project in the Lower Thames Valley) – an impressive achievement during a time of economic recession.

In conclusion, the research of Bell and Branch, and the strategic development of Quest, has had an outstanding impact on research and management strategies for wetlands, on the planning process and on methodologies for geoarchaeological research in the UK, Ireland and France. It has also had very considerable commercial implications, both in terms of individual practitioners and commercial units.

## **5. Sources to corroborate the impact**

### **(1) Heritage management**

- National and regional research frameworks and guidelines, notably the *English Heritage Environmental Archaeology Guide 2<sup>nd</sup> edition* (2011), and *The Archaeology of South West England: South West Archaeological Research Strategy* (2012)
- The impact of the research on management assessment and research strategies for wetlands is attested in testimonials from English Heritage (12 June 2013); Cadw (28 March 2013); National Museums of Wales (4 April 2013)
- *Time Team* (2013) Special: 'Britain's Stone Age Tsunami', Channel 4, 30<sup>th</sup> May
- *History of Ancient Britain* (2011), Episode 1, BBC Two 9<sup>th</sup> February
- National Geographic Magazine (December 2012)

### **(2) Impact on commerce and economic growth in commercial archaeology**

- Evidence of the wider impact on commerce of the research-led enterprise activities is provided in testimonials from Pre-Construct Archaeology Ltd (26 April 2013) and Surrey Archaeological Unit (17 April 2013)
- The overseas impact is demonstrated by a website: [www.seillevalley.com](http://www.seillevalley.com)