

Bridging the gap.

A workshop held at the Department of Geography, University of Hull, March 27/28 2008

The 'Bridging the Gap' project is concerned with exploring the ways in which long-term perspectives (considered as 100-10 000 year time spans) are used in conservation and environmental management. It starts from the premise that long term perspectives provide additional information which is valuable, but that their potential is under-exploited, and that one reason for this under-use is imperfect communication between people whose work focuses on long term or short term environmental processes. The workshop was convened to explore these issues. The organisers were Jane Bunting (University of Hull) and Nicki Whitehouse (Queen's University Belfast). A key feature of the meeting was reporting on a recent project exploring how modern vegetation and fauna are reflected in the material accumulating as deposits in the bottom of ponds.

The meeting was kicked off by Frans Vera, who briefly explained his 'wildwood as open wood-pasture' hypothesis and went on to discuss the basic rule of palaeoecology 'the present is the key to the past' – a key example being that:

- oak and hazel do not regenerate under closed canopy conditions,
- their pollen is abundant in deposits dating to the Wildwood period,
- therefore the Wildwood was sufficiently open for these plants to be able to maintain themselves in abundance.

The long-established closed canopy forest hypothesis - which underlies much modern nature conservation policy and practice - actually hinders real progress with nature conservation across Europe. Large herbivores are accepted as keystone species across Africa, Asia, etc, so why not here in Europe? Our aurochs, tarpan, etc, are now extinct and so the use of proxies (cattle, ponies, etc) to maintain our habitats is readily justifiable. A 6000ha polder reserve in the Netherlands is being maintained as predominantly open grassland by wild-living Heck cattle, koniks (ponies) and greylag geese. There is a need to review the pollen diagrams more carefully using knowledge from a variety of modern ecosystems combining large herbivores and trees. The pollen record itself is real data, but its interpretation is problematic, and the old closed canopy hypothesis is not acceptable as it does not fit the facts.

David Smith (University of Birmingham) and Nicki Whitehouse then reported on some preliminary results from their current project on recent deposits in ponds in modern wood pastures at Dunham Park, Epping Forest, Hatfield Forest and Windsor Great Park. Insect remains – primarily beetle fragments - can be used to provide important additional knowledge to supplement the pollen and other plant remains but we currently have no baseline for interpreting the beetle diagrams; there have been no modern analogue studies. Their project combines analyses of pollen and beetle remains in pond deposits with modern survey of vegetation and tree cover. They have found 30-50% tree pollen in the recent deposits which is actually similar to the present level of tree cover around the ponds. There are very high numbers of tree leaf-feeding insects in the closed-canopy Epping Forest study site and this something never found in the fossil record. The

palaeoecological records are dominated by wood-decay beetles but the Epping Forest recent deposits are full of beech flea weevil *Rhynchaenus fagi* – David can't recall any fossil record of this species. Nicki commented that there actually relatively low numbers of documented palaeoecological sites for the key Wildwood period. It is clear however that there was significant heterogeneity in the early landscapes. The palaeo record demonstrates high tree values, high dung values and high open values, which does suggest wood pasture. The Wildwood landscape was certainly much patchier than has previously been appreciated. However there is not a straightforward relationship between pollen data and beetle data. Data analysis from this project is at a very early stage.

Jane Bunting then spoke on her work on modelling pollen dispersal and deposition to inform analysis of pollen diagrams as ancient landscape reconstructions – she is developing new ways of interpretation and re-examining past assumptions.

Richard Bradshaw (University of Liverpool) explained how fire might have maintained open conditions within the Wildwood – oak is a fire-adapted species whereas beech is fire-sensitive, although establishes quickly following disturbance caused by fire.

Anne Birgitte Neilson (Copenhagen) reported on how pollen diagrams were being used in Denmark to inform close-to-nature forestry methods.

Althea Davies (University of Stirling) explained how people had played a major role in the ecosystem throughout the present interglacial and so the modern emphasis on 'natural processes' (i.e. excluding people) should be questioned. Natural processes often involve instability and intervention by people may be essential.

Ian Whyte (University of Lancaster) described the wide range of drivers of landscape change, including economic and social drivers (population size, agriculture, tree use, owner policies, and politics) as well as physical drivers (climate change, flooding patterns, erosion & deposition). Overgrazing impacts are manifold. The medieval period was dominated by monastic farms and we have little knowledge of the systems employed, the intensity of land-use or commercial aspects. Wall networks survive in many cases and can help us to understand how the land was used. Key modern drivers have been the 'improvement' phase of the 17th and 18th centuries, pressure to increase arable production during the Napoleonic wars, and the rise of the sporting estates due to mid 19th century prosperity. While there are good documentary sources on ownership, occupation, rents, disputes, and changing land-use – although the time resolution is variable – sources are notably poor on productivity (stocking densities, breeds, etc), there are few continuous long-runs of data, and data is thin before the 17th century. Palaeoecological data in contrast provides continuous chronological coverage, lots of data at single points, and relates directly to vegetation cover. The two disciplines (historical geography and palaeoecology) could potentially combine to produce some very interesting results and especially improve understanding of the dynamic.

Marcus Hall (University of Zurich) commented that the *mental* and *natural* environments influence theories – can ecologists be objective even when the facts are on hand?

Frank Chambers (University of Gloucestershire) has been studying pollen diagrams from moorland sites across the UK. The loss of Sphagna is noticeable in recent centuries, with consequent increases in Calluna and Empetrum, as well as Molinia. Charcoal is another relatively modern feature. The Industrial Revolution was a key period for change in northern England, especially the loss the Sphagna. Most degradation and impoverishment in South Wales is 20th century, although there were periods of local extinction in the medieval period. The current abundance of Molinia is modern and unprecedented and relates to the switch from cattle grazing to sheep, burning and nutrient-enrichment. So how should one choose the target vegetation type for modern nature conservation management? Should we aim to bring back particular lost Sphagna, which are important in peat formation? Heather moorland is a modern man-made phenomenon – there is no other record of such Calluna dominance in the pollen record.

Alistair Hamilton (Scottish Agricultural College) challenged the static view of modern nature conservation, pointing out the dynamism that is so apparent in the palaeoecological record. Conservation needs to identify base ranges which recognise natural variability. Old natural history records can be very informative about past biodiversity but are rarely used. EU Habitats Directive priorities are actually cultural landscapes but this is rarely acknowledged. What is ‘natural’? People need to be put back into nature, be re-connected with nature.

Brian Eversham (The Wildlife Trusts) reported on the Wildlife Trusts’ ‘A Living Landscape’ initiative which aims to achieve sustainable local communities and offers wider choices rather than single answers. He raised the issue of permeability of ‘wildlife corridors’ which can often act as barriers – woodland linkages block grassland species!

Jane Reed (University of Hull) reported on the concept of the ‘reference state’ for lakes being developed under the Water Framework Directive. Palaeoecology demonstrates that there is there is no ‘stable state’ for a particular water body and which can sensibly be used for conservation targeting. Even so-called ‘clean’ waters have undergone major changes over time through natural processes. The Directive aims to achieve good ecological status in inland waters by 2015 and biological monitoring has now come to the fore at last.

Keith Kirby (Natural England) discussed three separate things:

- the impact of rare, one-off events on the vegetation composition in woodlands, as illustrated by Wytham Woods;
- a preliminary model on calculating how much tree cover was required to maintain an average of 3 ancient trees per hectare;
- the weakness of the ancient woodland concept outside eastern England.

The meeting also included extended periods for wider discussions and especially addressed practical steps forwards. The intention is that a formal group of interested people be established, for a newsletter to be established to promote communication, and for further meetings to be arranged.

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9 April 2008