The Ghosts in Woodlands Past
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Abstract

Ancient, often medieval woods are highly regarded for nature conservation. However, until recently the impacts of traditional though variable management over many centuries were largely ignored. Wooded landscapes have provided multi-functional resources for European communities for several millennia. By medieval times, they were essential providers of wood, timber, leaf fodder, leaf mould, other herbage, pannage, pitch, potash, stone herbs, fruits and nuts, venison and much more. Increasingly it is now understood that British coppice woods fuelled much of the medieval community and especially early industry. Furthermore, in regions such as South Yorkshire the extensive network of ancient woodlands remaining today results from their value for industrial, intensive coppice. They provided fuel on an intensive and sustainable basis from the 1600s to the 1800s. This vital economic importance ensured the survival of woods in the regional landscape. However, whilst the woods were indeed maintained in the landscape, they were not unaltered. Industrial charcoal manufacture dramatically changed woodland ecology, and through de-turfing over hundreds of years to cover charcoal and whitecoal kilns, almost all native woodland ground flora was lost. Importantly, surface hydrology was modified beyond recovery, and soil horizons were extensively attenuated, so that recovery when it occurs is slow.

Production, harvesting, and use of small wood for domestic fuel occurred widely in many areas. This is a different process and its impacts are different from those of industrial coppice. In Britain, industrial use was mostly from the late medieval and early industrial periods. Fowler (2002) noted that use in Scotland extended from the late 1600s to the late 1800s, after which it declined. Intensive activity only lasted around 200 years; far less than the potential lifespan of an Oak. Nevertheless, the impacts were dramatic. In many of these woods, the ground flora is still impoverished, almost beyond recognition. Yet until recently this ecology that is an artefact of site management history was overlooked, these species-poor floras assumed inherently typical of such woods. To understand the ecology of today’s woodlands, it is important to place them in their historic context, to walk in the footsteps of the ghosts of woodlands past.
Introduction

Detailed studies in the British Isles (e.g. Rotherham & Ardron, 2006; Rotherham & Jones, 2000a) have demonstrated the depth of evidence and the diversity of interactions between people and wooded landscapes. In North America, there are similar trends discernable (e.g. Davis, 1996). It was during the 1980s, that interest in British ancient woodlands grew with research and writing by woodland enthusiasts (for example Rackham, 1980; 1986; Peterken, 1981, 1996); a re-kindled interest paralleled across Europe (e.g. Agnoletti & Anderson, 2000; and Agnoletti, 2006). Major international meetings have helped foster research exchanges (e.g. Agnoletti & Anderson, 2000; Agnoletti, 2006; Kirby et al., 1998; Humphrey et al., 1998) and there have been major publications that show the wide international interest (Rackham & Moody, 1997; Grove & Rackham, 2003; Laszlovsky & Szabó, 2003).

Wooded landscapes are important living catalogues of regional history (Jones, 1996; Jones & Walker, 1997; Jones, 1997; Jones, 1998). However, despite this interest, deep-seated problems remain in the understanding of culture and nature in these landscapes (Rotherham & Ardron, 2006; Rotherham & Jones, 2000a). This paper is based on thirty years research into regional woodlands in northern central England. There is an extensive literature referred to and acknowledged, but not reviewed here. The paper considers cultural knowledge loss and implications for future trends.

Understanding their complexity is important to appreciate and conserve woodlands, and this takes a multidisciplinary approach often lacking in academic studies. It is noted that there are long-term trends that need to be effectively addressed for landscape management to become sustainable. Whilst these multi-faceted landscapes have generated some educational- and recreationally-based conservation programmes, there are serious management issues with a de-coupling of the resource from its cultural origins. Most twenty-first century, wooded landscapes across Europe are severed from both their natural and cultural origins. In the UK for example, their main economic drivers are now tourism and recreation (Graham Haddock, Forestry Commission, pers. comm.). There are on-going academic debates on the nature of ‘natural’ woodland in Europe (Peterken, 1996; Vera, 2000). These are relevant to the issues raised by this paper. It is suggested that these are inherently ‘cultural landscapes’, multi-layered palimpsests of human interactions with nature. To regard them as ‘natural’ is misguided and unhelpful.

British wooded landscapes result from millennia of human interactions with the environment. In a European context, England in particular, is relatively poorly wooded (Rackham, 1986; Rotherham & Jones, 2000). Surviving semi-natural woodlands are relatively small and
vulnerable to clearance and neglect. Indeed, woods over fifty hectares are uncommon, and over 100 hectares rare. In our case study region of South Yorkshire, there are 333 ancient woodlands covering 2.8% (4,451 hectares) of the land surface (Eccles, 1986). Only one exceeds 200 hectares, four are 100-200 hectares, five 50-100 hectares, and 157 (47%) below 5 hectares. Active management and periods of abandonment have affected the ecologies of South Yorkshire’s woodlands. These reflect changed function, ownership, economics, cultural and social importance, plus urban and industrial impacts (Rotherham & Jones, 2000).

considered social, political, and economic drivers of change in this landscape. Rotherham and Ardon (2006) discussed knowledge loss and its implications. The ecology was influenced by successive regimes of wood pasture, coppice-with-standards, and high forest, with in recent decades, major urban influences having profound impacts. With nearly a hundred ancient woodland sites managed for 7-800 years as traditional coppice-with-standards woods, and well-documented history, Sheffield (South Yorkshire, England) makes an informative case study (e.g. Bownes et al., 1991; Jones, 2003; Rotherham & Jones, 2000b; Sheffield Woodland Policy, 1987). Woodland products included constructional timber and underwood for charcoal and white coal for metal smelting and working. The woods literally fuelled the region’s industrial revolution, providing energy and materials. These uses declined from 1850 to 1910, with conversion to high forest plantations and ultimately local authority-owned, amenity woods, many locked into urban areas.

The Decline of Tradition

In this region, traditional coppice woodlands declined rapidly, map and archive evidence showing piecemeal conversion of sites to plantation high forest. This was from the mid-1800s, by owners of large estates, with site destruction or abandonment (through urban spread or farming). These continued until the 1930s with woods lost to urban development, neglect, and passed to local authorities for recreation and amenity. Importantly, from the 1920s to 1980 local authorities purchased many ancient woods for community benefit. These were managed until the 1990s by a workforce of 20-30 in part commercially. By the 1980s, diminished finance and lack of dedicated grant aid meant local authorities could no longer do this. Furthermore, their ability to deliver commercial forestry also declined dramatically.

The status and functions of wooded sites varied though the twentieth century, depending on whether they were managed as ‘amenity’ or ‘recreational’ woods (largely abandoned), or as productive estates. The latter were often planted with exotic conifers to replace native broadleaves, or were new plantings of beech, sycamore, or conifers. Small numbers, but often important conservation sites, they were managed, often unsympathetically by farm tenants. In
all cases, the traditional management of woodland or forest stopped early in the century or for some small, privately owned woods at the latest by the 1950s. The last recorded hazel coppice management was of farm-owned woods in the 1950s. This ceased when the land was ‘compulsorily purchased’ for urban development and the farms demolished. The local authority-owned estates were often intensively drained, amenity woods with periods of rigorous safety and tidiness management. Even as late as the 1990s, woods were rigorously scoured for dead wood, and for wet areas to be drained. There were significant cases of replacement by exotic trees and under-planting with exotic shrubs. During the same period, and increasingly towards the late twentieth century woods were actively invaded by alien plants and cultivars from gardens; the species differing in urban and in rural locations.

Some of the changes were observed directly when, for over thirty years, the author worked closely with woodland managers documenting changes through action research. By the 1970s, there was almost no local memory of traditional uses, functions, or origins. In the late twentieth century, memories were of commercial, plantation, high forests not traditional coppice woodlands. This was despite photographic evidence of traditional charcoal burners working the woods in the early 1900s (Figure 1). Local people, including forestry staff, had lost all knowledge only fifty years on. The same applied to other local woodland crafts and workers: basket making, clog making, beesom making, and hurdle making, and others like tanning. One local tannery still operates in a traditional fashion in Chesterfield, but its links to regional woods have been lost. The harvesting of winter Holly from managed ‘hollins’ and ‘haggs’ for winter fodder was another long-term use that declined and to be lost from memory (Jones, 2003). Yet abandoned Holly woods with their dense cover of *Ilex aquifolium* remain, along with place-names and road-names. The imprint remains in place-names and family names but not in the community. Indeed, by the late 1970s in Sheffield, local people including foresters and other woodland managers thought no woods in the district were ancient. All were believed to have been planted over the last 200 years.

One reason local people did not recognise their ancient woods, was the absence of big trees; interviews showing they associated ‘ancient woods’ with large veterans. However, centuries of industrial coppice had removed these, and since for the public ancient trees are big, and in Sheffield, there were very few, it seemed these woods could not be ancient. In the region some of the oldest trees are actually smaller species such as Holly clones or Rowan coppices, and these are not what people expect. However, palimpsests of archaeological evidence (Rotherham & Ardron, 2006) are testimony to usage, sometimes sustainable, other times not, over millennia. Relicts of former management, a ‘singed’ coppice or ‘elephant’s foot’, are unique archives of woodland and landscape history, easily lost through uninformed
management. The impacts of cultural uses are embedded deeply into the wooded landscapes with changed ecology, hydrology, and pedology. From 1960 to 1980 woodland management across the region reflected this misunderstanding and recreational park management prevailed.

**Changing awareness**

The research that underpins this paper included detailed site-based case studies. Over a period of 10-15 years, these have changed our understanding of these cultural landscapes. Furthermore, scoping, surveys and information-exchange across the UK, Europe and the USA, confirm close parallels. There is now interest in conserving and re-creating past uses, at least for demonstration purposes; woods and forests considered of social and economic value. Nevertheless, recognition of their cultural significance is limited, and definitions of what is cultural, archaeological, or ecological remain problematic (Rotherham & Ardron, 2006).

Current initiatives on behalf of IUFRO (in prep.) reflect the serious concerns that cultural uses and attachments are being lost and that this affects potential sustainable development. There is a lack of effective protection for archaeology, and low awareness of changed soils and vegetation from the ‘natural’ forest.

**Methods**

This paper considers issues of changed attitudes to woodlands, the loss of local cultural knowledge, and the cessation of traditional or industrial exploitation. These are considered for the case study region (around Sheffield, South Yorkshire, England) and in the context of cultural knowledge loss examined through the Ecclesall Woods case study. Along with detailed searches of archival materials and published literature (e.g. Rotherham & Medforth, 1997) on woodland and forest management, oral histories were gathered from local woodworkers and foresters. Changes in approaches and attitudes were observed and assessed using action research over 25-30 years. This is long-term information acquisition through mixed methodologies, with the potential to triangulate multi-disciplinary findings and give confidence in the outputs. The studies combined long-term field-studies (detailed ecological and archaeological site surveys with GPS and GIS mapping, and experimental site management and ecological monitoring (Vickers & Rotherham, 2000)), social case studies, archival materials, oral histories and action research. These were placed in a context of social, economic, and political changes and drivers over the period considered. Detailed time-lines for wooded landscapes in the study region (Figure 2) including the main case study (Ecclesall Woods, Sheffield) have been produced for around 4,000 years. The core study area is around Sheffield in South Yorkshire, extending into north Derbyshire, north Nottinghamshire, and
The detailed case study was the subject of a national conference in 1992 (Beswick & Rotherham, 1993), and findings presented on this and other study sites at major meetings in the UK and elsewhere in Europe (Rotherham, 1996; Rotherham & Avison, 1998; Rotherham & Jones, 2000b). Issues were also debated through the UK national network the Landscape Conservation Forum, and following a major European-wide conference held in Sheffield in 2003 (Rotherham & Handley, 2003), tested across the UK by an ongoing programme of academic and practitioner workshops; around thirty held so far. The community and volunteer part of this is the Woodland Heritage Champions project, running in conjunction with the Woodland Trust, the Forestry Commission, the Heritage Lottery Fund, and the Ancient Tree Forum. Scoping studies and information exchanges have occurred with Poland, Ukraine, Romania, Turkey, Italy, Ireland, Scotland, Wales, France, Holland, Germany, Sweden, and the USA. There is ongoing research to analyse site information and develop a handbook to woodland archaeological features at a UK national level. This is with the Woodland Trust and the Forestry Commission, and observations have been made at sites across Europe. In 2006, the European Cultural Forest Network facilitated by the Biodiversity and Landscape History Research Institute (Sheffield (UK)) was established to foster this exchange of information and ideas.

**Results**

**Sheffield Area Case Study: Changes and Loss of Cultural Knowledge**

The summary results of the detailed case study at Ecclesall Woods (Sheffield) are presented in Table 1, and the drivers of change and their impacts (based on the regional study) in Table 2. By 1970, all local memory of traditional uses, functions, or origins of the region’s woods had gone. With oral traditions lost, some technologies and processes remained undocumented and enigmatic. This trend in the study region mirrors those described earlier, but is perhaps more acute due to intensive industrialisation and urbanisation. Remarkably, Sheffield is one of the most richly wooded industrial cities in northwest Europe (80+ ‘ancient’ woods), largely due to industrialist landowners protecting woods for vital coppice production (Jones, 2003; Perlin, 1989). However, managers and conservationists often fail to understand how these woods were changed by management as industrial coppice (Rotherham & Jones, 2000; Rotherham & Ardron, 2006), and this has major implications for future sustainability.
Drivers of Change and a Shared History

For Britain generally, and the case-study region specifically, a new appreciation of woodlands and especially ancient woodlands emerged in the 1980s. Understanding of the nature and drivers that shape these landscapes has emerged and changed over the last twenty years. Rotherham and Jones (2000) discussed these for South Yorkshire, and Mills (1994) presented an overview of forest landscape history nearby West Yorkshire with trends linked to utilisation and traditional crafts. By the 1980s, many woods across a wide area had received almost no active management over the period 1920 to 1970. The only active management for many sites was ‘care and maintenance’ and amenity / recreation ‘improvements’ such as drainage of wet areas and the introduction of large numbers of exotic tree and shrub species.

Recent studies have changed our understanding of the nature of these landscapes and of drivers that shaped them. Rotherham and Jones (2000) discussed some of these for South Yorkshire. As the research widened to include studies across the UK and internationally, similar trends and evidence were found. There are differences in detail and in the timing of particular processes or events, but shared underlying principles.

Ecological Trends

The case study shows major shifts in the ecological character of these wooded landscapes. Changes have occurred over several millennia associated with different phenomena but this account is restricted to the most recent 1,000 years. During this time, there are key changes:

- Eutrophication from atmospheric nutrient fallout and decreased limited removal of biomass compared with a coppice wood;
- Successional change following canopy closure, competitive effects, lack of micro-disturbance from woodland workers and their animals and macro-disruption including recreational impacts;
- Removal of topsoil and vegetation for charcoal manufacture;
- Decline in dead wood and associated species;
- Response to long-term trends of environmental change;
- Destructive but localised winter grazing of farm livestock;
- Urbanisation impacts;
- Socio-ecological impacts with planted trees, theft of attractive herbs, and introduction of garden throw-outs, plus nutrient inputs;
- Boundary incursions into woods from adjacent houses;
Disposal of ‘green waste’ from adjacent houses, including propagules of exotic species;

Housing in close proximity to woods leading to demands for removal of trees.

These are discussed in more detail elsewhere with work on-going key trends are noted to establish impact range and magnitude.

Hydrological Trends

Major studies of the impacts of urbanisation on woodland hydrology were undertaken in the study region (Griffiths et al., 1995 & 1996; Griffiths & Rotherham, 1996a/b). All these woods suffer from desiccation and drought, detailed case studies confirming the main agents of de-watering:

- Woodland internal drains still active and desiccating; many actively maintained and even enhanced during the twentieth century amenity woodlands phase;
- Continuing drainage maintenance associated with recreational and amenity uses and perceptions of an urbanised population;
- Urbanisation and ‘water theft’ have left woods as isolated islands of habitat; now more-or-less surrounded by development and roads, services and drains sunk into trenches and beds of aggregate. Soft surfaces extensively replaced by tarmac and concrete;
- New urban developments impacting on surface drainage.

There is little positive action to mitigate these impacts and in the regional study, desiccation continues, so wooded landscapes, urban and rural, all suffer water-loss. The sites often severed or de-coupled from cultural and environmental origins, survive as isolated habitat-islands in what are often inhospitable landscapes. Long-term drought is responsible for significant ecological trends away from their ancient woodland origins with many woodland indicator species now isolated and vulnerable (Bownes et al., 1991).

Cultural Impacts

A major impact has been loss of dead wood, both standing and fallen, on living and dead trees. This has adversely affected many taxa considered important in ancient woods and is recognised as a problem across Europe, the EEC Committee of Ministers Recommendation Number R (88)10 ‘On the Protection of Saproxylic Organisms and their Biotopes’, setting a policy standard across the Community. Comparing modern woodlands following decades as tidy sites, and those in medieval times or unmanaged forest, suggests they are depleted compared with more ‘natural’ forests. This is results from Victorian foresters and twentieth century amenity woodland managers liking clean, tidy woods. It appears that the public also
favour clean, tidy woods, which is bad news for dead wood, wildlife, and history. Over periods of between 150-350 years, management of many woods in the region was economically driven by intensive production to supply emerging mining and metal-based industries. This intensive exploitation was often followed by 100-150 years of abandonment or amenity recreation management, but with a philosophy of clean, tidy woods with clean, tidy trees. The mentality of the park-keeper pre-dominated; implemented by teams of urban tree officers. This history over 250-500 years is now well-established and left woods impoverished in dead and decaying wood.

According to published figures, (Kirby & Drake, 1993; Kirby et al., 1998), levels of dead wood are probably less than 5% of that in ‘natural woodland’ and less than 15% of that in traditionally managed woods. These figures may be even lower if the emerging concepts of the nature of traditional forests (Peterken, 1996; Vera, 2000) are correct. A further and potentially catastrophic impact of human activity is the loss of surface and ground waters. Amongst other impacts is the almost total loss of formerly extensive valley-bottom wet woodlands. Archives and accounts from woods that remain suggest former wetness; woodland owners and managers in the 1700s and 1800s obsessed with drainage. Owler Car Wood (Moss Valley) and Ecclesall Woods have extensive drainage networks and are now desiccated. De-watering continued through the 1900s and the amenity woodland period, with added and catastrophic effects of urban development and intensive arable farming with no attempts so far to remediate these impacts.

A Detailed Case Study: Summary of the Evidence of Human Activity in Ecclesall Woods

i. The Impacts of Charcoal and Whitecoal Production in Woodlands

Intensive site surveys and mapping revealed major loss of vegetation cover and of topsoil. Rotherham & Doram (1990) and Hart (1993) first described this impact of woodland topsoil- and turf-stripping for charcoal production (Figures 5 & 6) with impoverished ground flora resulting from charcoal and whitecoal production, and both topsoil and species loss. The scale of this impact along with the implications for woodland vegetation was previously overlooked. Since the original observations, the extent of charcoal and whitecoal production in local woodlands, and their associated impacts have been further described (Ardron & Rotherham, 1996). Combined impacts of whitecoal (kiln-dried wood used in post-medieval lead smelting) and charcoal production on woodland soils and vegetation are potentially very significant. Areas unaffected had well-developed soil ‘A’ horizons, neutral or slightly acid, characterised by typical ancient woodland indicators: *Mercurialis perennis* (dog’s mercury),
Lamiastrum galeobdolon (yellow archangel), Anemone nemorosa (wood anemone), Allium ursinum (ramsons), Galium odoratum (woodruff), Sanicula europea (sanicle), Stellaria holostea (greater stitchwort), Veronica montana (wood speedwell), Circaea lutetiana (enchanters nightshade), Melica uniflora (wood melick) and Milium effusum (wood millet).

Woodland areas affected by intensive ‘coaling’ had thin ‘A’ horizons and pH 3.5-4.5, typical plants included: Holcus mollis (creeping soft-grass), Rubus fruticosus agg. (bramble), Lonicera periclymenum (honeysuckle), Deschampsia flexuosa (wavy hair-grass), Pteridium aquilinum (bracken), Dryopteris dilatata (broad buckler fern), Hyacinthoides non-scripta (bluebell) and Luzula pilosa (hairy woodrush).

Earlier surveyors recognised that ‘kilns’ were constructed on hearth surfaces (sometimes called pitsteads) but descriptions were limited. Hart (1993) noted faint bowl-type earthworks and others (e.g. Crossley, 1993) the occurrence of platforms but offering little help in field identification. Limited guidance and narrow perceptions meant their significance in woodland landscapes remained unappreciated. A detailed survey by an experienced archaeologist for the 1992 Conference (Beswick & Rotherham, 1993) revealed only 60-70 ‘coal kilns and charcoal hearth pits’, but our intensive survey confirmed 3-400 charcoal hearths and 100+ Q-pits. With practice, suspected charcoal hearths can be found and confirmed.

Following the original observations, extensive research was undertaken to assess charcoal manufacture in regional woodlands. Field evidence is corroborated by documentation, and charcoal production using ‘clamp-kilns’ in local woodlands is well known from post-medieval documents (Jones, 1993). Since many ancient woodland ‘indicator’ plants and animals require both continuity of woodland cover, and lack of major disturbance they have suffered through these long-term activities. Some plants like such as hairy woodrush (Luzula pilosa) are associated with small-scale, localised disturbance around Q-pits.

ii. Drains and Ditches and Banks

Ditches, drains, and banks (artificial cuts and modified streams) are widespread, permeating many of the case study woods with extensive drainage networks. Dating these is not easy since they vary from minor alterations of natural streams, to significant, constructed, stone-lined structures. Originally, surveyors assigned them as coppice or other management compartment boundaries, but detailed mapping does not support this. They may have origins in medieval coppice phases with later enhancement (in industrial times, the Victorian high forest period, and even in the twentieth century amenity woods). Some may be much earlier perhaps Romano-British, and associated with now recognised non-woodland phases: settlements and field systems. However, the most intensive imposition of drains was
undoubtedly during the late eighteenth and nineteenth centuries for land improvement that occurred widely in wooded landscapes. When taken into local authority ownership in the early twentieth century, the drainage network of Ecclesall Woods was vigorously maintained. Today most of the site is dry and free draining. Small areas of species-rich vegetation such as Mirey Wood’ remain reasonably intact, but affected by drains. Similarly, Owler Car Wood (meaning a ‘wet alder wood’) is now dry and has lost topsoil and organic deposits due to combined downwash and sediment degradation associated with drainage on conversion to coppice in the 1700s and 1800s. Impacts on these woods have been considerable with only small areas remaining wet and woodland ecology dramatically changed. Understanding drainage impacts is vital to effective landscape evaluation, and for both nature and archaeological conservation, restoring wetness may be very desirable.

iii. Boundaries, Track-ways, and Other Features

The case study sites are extensively dissected by linear features which along with ditches and drains, include sunken tracks (packhorse routes and drovers’ ways, industrial tramways from nineteenth century ganister quarries, numerous minor paths and tracks related to woodland management and contemporary recreational route-ways), and boundaries. The latter include medieval wood-banks, early medieval deer park pales, possibly earlier administrative boundaries of regional significance (with location on the Kingdom boundary of Anglo-Saxon Mercia and Northumbria). There are extensive lynchets, hedges and walls of varying forms, sizes, and origins, with earth-fast boundary stones and double-orthostat walls. There are early settlement sites (Romano-British settlements and field systems, possible Anglo-Saxon farmsteads, Bronze Age and possible Neolithic sites), including a hilltop enclosure. Adjacent to the latter is an intact Romano-British field system.

A wide range of features relates to early and later industrial use, including charcoal and Q-pits, sawpits, bell-pits for coal and ironstone, mills and smelting sites for lead and iron manufacture. The woods were important sources of stone from small–scale building-stone quarries to medium-scale ganister extraction for refractory materials. Ecclesall Woods contains numerous minor stone-getting holes, Romano-British quern-stone manufacture, and several large quarry workings. Each activity left distinctive marks on the woods. Many point-features and locations inter-link through networks of tracks, roads, and boundaries. Some activities happened but are difficult to determine, with woodland craftsmen and their families spending much of their lives in the woods. They, probably with families and livestock, were there for much of the year. However, apart from old photographs of charcoal burners’ settlements in Sheffield in the early 1900s, there is little evidence of their encampments.
One of the main impacts of industrial coppicing of these woodlands was extensive removal of vegetation and topsoil, taken to cover charcoal clamp kilns.(mostly for iron and lead smelting). In the cultural forest, we see the woodman through the trees, in relict coppices, in soil, vegetation, and lack of water. This was first described for the case studies in the early 1990s following collaborative ecological and archaeological studies. Until then it was widely assumed that the woodlands of the extensive Coal Measures Series geological region (Figure 4) were inherently species-poor. This research demonstrated that absence of ancient woodland flora from much of the ground area of these sites was an artefact of around 500 years of intensive, industrial use. These impacts are compounded by, and themselves exacerbate, the hydrological impacts described earlier. The core woodland areas have extensive removal of topsoil, subsoil, and vegetation; the latter now restricted to wet areas, stream-sides, and ‘halo’ zones of deeper, un-stripped, brown-earth soil around the outer perimeter of the woods. These effects remained unrecognised until the research of the 1980s, which is surprising with the intensive, regional, botanical surveys of Sheffield University’s Unit of Comparative Plant Ecology from 1960 to 2000. However, the regional and site-based case studies suggest that the woodman has left an indelible imprint on the woods, with loss of soil, plants, and water. Preliminary observations elsewhere in Europe suggest woods with similar heritage of landscape archaeological features relating to former management. Furthermore, discussions with researchers indicate lack of effective recognition is a serious problem. So far, we have considered sites and exchanged information with senior researchers in Northern Italy, Turkey, Sweden, Ireland, Holland, Hungary, Rumania, Portugal, Spain, and southern France. In all these, there is similarity with the UK woodlands. Recent observations in Poland and Ukraine confirm that their extensive forests have rich but unrecognised woodland archaeology, with boundaries, bitches and banks, pits and platforms, and working trees. Much of the evidence is part masked by recent forestry activity.

**Discussion**

Woodland management across Europe has changed over time, with varying balance between wood-pasture grazing and coppice, other uses, and non-woodland. There are still debates over the spatial extent, the balances, interactions, and drivers of change. However, over the millennia a primeval landscape changed through human-driven utilisation to compartments, large and small, and long-term, often tradition management. Sometimes rights and ownership were vested in an individual or an estate (large or small), and sometimes held in common (De Moor et al. 2002). The exact mechanisms were complex, varied over time and from place to place, but by the medieval period, wooded landscapes occurred in recognisable forms,
broadly divided into wood-pastures, and woods or coppice; with perhaps limited or at least localised areas of natural, closed-canopy woodland. It has been accepted since Rackham in (1980) and (1986), that wood-pasture was once widespread and common in northwestern Europe. This is in essence a landscape where trees are grown in combination with large grazing herbivores (domesticated, semi-domesticated, wild, or mixed). This is well documented in England, the Domesday Book (1086) recording a landscape with wood-pasture dominant. Vera (2000) suggested that managed wood-pasture evolved from grazed forest and savannah, an ancient system of management in multi-functional landscapes with plentiful woodland. There was little need for formal coppice. Coppice wood management is a more intensive and rigorous system to guarantee vital supplies of wood (and sometimes timber) in a resource-limited landscape (Fowler, 2002; Hayman, 2003; Perlin, 1989). Analysis suggests pasture-woodland is the older, more ‘natural’ system and interestingly, most livestock wild or domesticated prefer leaf-fodder to grazing (Vera, 2000).

Today’s landscapes of woods, parks, wooded commons and heaths, and forests (across the case study region) grew from medieval landscapes mixing trees and grazing or browsing mammals. They evolved from wood-pasture and wooded commons, relicts of prehistoric wooded savannah, which by medieval times had coppice woods, holts, hags, and hollins embedded within them. The latter were each managed to produce specific woodland materials (Jones, 2003). Both types of wooded landscape were characterised by ‘working trees’ including pollards, stubs, and coppice stools in protected ‘woods’ and some in the wider grazed landscape. By the 1700s and 1800s, many wooded landscapes were affected by two major drivers. The first was the imposition of formal estates and grand landscape parks for the aristocracy, reflecting status and offering recreation. Second, was growth of industrialised, plantation forestry. In regions like South Yorkshire (England), these fuelled emerging industries, producing wood charcoal for smelting and later pit props for coalmines (Rotherham & Egan, 2005). The regional character of the traditional uses and their impacts varies considerably. In the UK, there are regions such as Cumbria that had major use for potash and for charcoal, in the Chilterns the intensive ‘bodging’ for chair manufacture, in North Derbyshire and South Yorkshire were charcoal, whitecoal, mineral coal, and pit props. Numerous woods in the West Midlands were maintained as coppice until the 1980s to supply handles for paintbrushes. The patterns are repeated across the country and then across Europe, with similar trends but difference in detail.

The balance of ‘culture’ and ‘nature’ in these landscapes is important in terms of understanding their origins and in guiding their future management. Vera’s thesis (Vera, 2000) is important in this. The implications of this was discussed at key meetings (e.g.
Working and Walking in the Footsteps of Ghosts 2003 (Rotherham & Handley, 2003); Crisis and Continuum in the Shaping of Landscapes 2005 (Rotherham, 2005a)), and in related publications (Rotherham, 2003; Rotherham, 2005a; Hodder et al., 2005). Rackham (2003b) examined Vera’s work noting the need to consider context and diversity in forested landscapes and human impacts across Europe. He highlighted savannah in Europe suggesting it to be a Mediterranean feature, adding the need to consider eastern European landscapes too. It seems reasonable that ancient deer parks, medieval forests, and other grazed, wooded landscapes are the most ‘natural’ forested areas in Western Europe, with valley-bottom wet woodlands where they survive. However, it also seems fair to suggest the typical ‘ancient’ woodlands found throughout lowland England and our case-study region, are strongly ‘cultural’ landscapes. In the case studies, the cultural landscape of medieval and then industrial coppice woodland are most significant though not exclusively so. The described cultural knowledge loss and the archaeological surveys relate mostly to this type of wood; the region having extensive heaths, moors, relict deer parks, and medieval chases described elsewhere (Jones, 1996; Rotherham, 1999).

Landscape Change and Knowledge Loss

The described changes fragmented earlier landscapes. They weakened, changed, or removed social systems and common rights tied to environmental resources; generating today’s woodlands. As industrial demands were satisfied by other technologies, and rural traditions lapsed woods were abandoned, or management intensified through twentieth century agro-forestry (Fowler, 2002; Hayman, 2003). By the late twentieth century in countries like England, the economic driver for woods and forests had shifted from primary production of timber, wood, and other raw materials to tourism and recreation. However, there are some serious issues in terms of the economic drivers of these landscapes. Economic benefits from contemporary landscapes often do not relate directly to woodland or forest management. The wooded landscape is often considered a ‘natural’ backcloth to be taken for granted and, as a natural feature, caring for itself. This is clearly not so and historic perspectives most-effectively demonstrate long-term social and economic drivers in wooded landscapes. An important aspect of this is the loss of traditional cultural knowledge. Where traditional management ceased between 100 and 150 years ago, (as in South Yorkshire), most local knowledge of woodland use in earlier times has gone. This phenomenon can be observed across all regions of Northern and Western Europe. Recent observations in Roztoczański Park near Zamość in Poland support this. There is ample evidence in the archaeology of the forest landscape of former woodland crafts and management: charcoal hearths, potash pits, boundary features, relict coppice and other working trees. Local forest rangers had little
knowledge of the archaeological evidence or of traditional management. However, they were able to confirm charcoal manufactured from around 100 years ago. This seems typical of most situations were the utilisation has changed. Some of the issues and consequences of the lack of recognition of former landscape use, of woodland archaeology, and the implications for contemporary management were addressed by Rotherham & Ardron (2006), and Rotherham (2007).

Conclusions

There are serious problems of a lack of awareness of historic landscapes and their evidence by foresters and ecologists. Furthermore, archaeologists tend to recognise and protect archaeology ‘in’ the woods, focussing on ‘monuments’. They generally overlook archaeology ‘of’ the woods: ‘working’ and other culturally significant trees, pits, platforms, boundaries and other features. Additionally, because wooded landscapes often avoided intensive and destructive impacts of twentieth century cultivation (in farmed areas) and construction (in built areas), they frequently hold valuable evidence of former human occupation and activities. These are rich cultural landscapes with the Sheffield case studies having ‘monuments’ and ‘finds’ from the late Neolithic onwards (Rotherham & Ardron, 2001).

Renewed interest in British woodland histories has generated moves to reinstate native, broadleaved tree species with demonstration projects and targeted conservation programmes of ‘traditional’ management. However, despite the increased interest in, and awareness of, wooded landscapes, understanding and knowledge of traditional management and cultural origins have declined. Yet if they are to be sustainable, future visions of Europe’s wooded landscapes need to take account of their multi-faceted natures. For this, it is important to recognise, identify, and assess typical processes, landscape evidence, and regional distinction. Across Europe, there is on-going research at many centres and it is important that findings are shared to foster wider appreciation. This aids recognition of the importance of forest archaeology and history to inform visions of future sustainable forest landscapes, a process supported by the European Cultural Forest Network.

What are the main impacts of cultural severance in these wooded landscapes? It is suggested that it is important to recognise, identify, and assess typical processes and evidence in woods and forest, along with factors of regional distinction. Modified for economic use, woods have been managed often continuously for many years. Mostly managed as industrial or rural coppice-with-standards, the case study woods were worked, used, extracted. Veteran trees sometimes survive on boundaries, track-ways, and in parks and commons. The wooded landscapes that survive were affected by Victorian high forest conversion, exotic species, and
then neglect or conifer-plantings. Old trees were lost through management, ‘Dutch Elm Disease’, and in urban areas vandalism, and what remains reflects these influences. Now the long-term impacts on hydrology, dead wood, and soils present problems for future conservation. Non-natives such as Highclere Holly, Portuguese Laurel, Sweet Chestnut, Swedish Whitebeam, and Variegated Yellow Archangel are controversial and potentially problematic (Rotherham, 2005). There are questions of what to do, why, when and who decides? Science and history inform, but decisions are subjective, perhaps valid, but choices to be made. With the dynamic nature of these cultural landscapes, how can ecology and the imprints of past human activity be conserved?

Recognition, Contemporary Management and Future Visions

For the case study sites the surveys of archaeology and ecology begun in the 1980s, changed perceptions and action research confirmed this. For wooded landscapes to be effectively conserved recognition of their nature is important. With the loss of cultural knowledge, this becomes more urgent with time as memories are lost, and site management tends to abandonment or intensification. The ability to evaluate woodland archaeology and history to inform future visions of sustainable forest landscapes is therefore particularly important. This process of recognition, evaluation, and assessment drives the European Cultural Forest Network, launched at the Florence 2006 meeting. Indeed the in-depth regional studies and scoping assessments undertaken so far indicate serious problems for contemporary management. In some cases sites abandoned for decades when management is reintroduced, and they may react in undesirable or unpredictable ways. Managers often ignore history and deep-seated ecological trends when developing and implementing plans. With woodland context changed, many sites are urbanised and fragmented, or isolated in intensive farmland. Soils, archaeology, working trees, and vegetation are precious resources, an ‘eco-archaeological archive’; pits, platforms, soil profiles, sediments, plant indicators, banks, ditches, track-ways and roads, tell of land-use and human activity.

Local Cultural Knowledge Loss

Fundamental drivers in the wooded landscape have been altered or removed, many sites now valued for recreation and tourism, not subsistence and survival. In 1986, Rackham noted how woods were threatened when economic importance waned, and contemporary wooded landscapes risk severance from their direct, local economic functions. In place of this, they provide backdrops to tourism and leisure, the visitor’s gaze and the community’s recreation. Former economic values, costs, and controls of resource and management were with the same community if not the same person. This is no longer so, with values and costs generally
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separated the woodland is de-coupled from both cultural and industrial drivers. Furthermore, these are complex palimpsests of culture and nature and with cultural knowledge loss these landscapes are misunderstood. They are seen as ancient, natural, and primeval on the one hand, and young and secondary on the other. To let nature take its course as often advocated leads to major changes, not necessarily sustainable. In the cultural forest, we can see the woodman through the trees as relict coppices, ancient pollards, pits and platforms, and in soil, vegetation, and lack of water. There is an indelible imprint on the woods, along with loss of soil and of water. These are cultural landscapes and this paper argues that the future vision of Europe’s forests must recognise this.

The rapid and progressive loss of local cultural knowledge is worrying though declines are not uniform. For example, traditional English clamp kiln charcoal manufacture ceased by the 1950s. With only one traditional charcoal man left, some records were made of the process. Around the Mediterranean and Eastern Europe, the same craft continues but is in decline. Some woodland crafts such as potash and tar production remain elusive in the UK but they can be understood through research elsewhere, such as in Sweden (Lars Östlund pers. comm.; Borgegård, 1973; Östlund et al., 1998). Other activities like whitecoal manufacture for sixteenth century lead smelting in the UK had major impacts on woodland ecology, but left no local knowledge and little documentation. This provides a warning for regions that retain traditional crafts; they are easily lost. Some cultural attachments also vary. For example, across much of Europe there is more local domestic fuelwood use than in Britain, maintaining links to woodland function.

It is obvious that these issues become more acute with environmental change (particularly climate change and eutrophication). Debates about European forest origins and dynamics and therefore of particular importance (Vera, 2000; Rotherham, 2003; Rotherham, 2005a; Hodder et al., 2005; Rackham, 2003b). For sustainability, wooded landscapes need to be dynamic and fluid, and in this context, local cultural attachments are important. ‘Cultural severance’ or de-coupling in the landscape presents serious challenges. Whilst many woodland conservation projects are very laudable, most relate to small areas in educational or conservation management, and larger ones driven by recreation and tourism. Landscape-scale conservation reflecting natural and cultural origins is still someway off. As cultural landscapes, forests and woods reflect complex interactions between environment and history; the regional surveys and case studies demonstrate depth in these relationships and indicate potential problems ahead.
References


