

What does 'traditional' management really mean?

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Introduction

In spite of the increases in our knowledge achieved over the past half century, not least through the contributions of Oliver Rackham, we still know relatively little about historic land use practices or their ecological outcomes. By the time the characteristics of particular habitat types were first recorded in the mid-late nineteenth century, by Richard Jefferies for example, they were already changing fast, as a consequence of agricultural modernisation, industrialisation, and unprecedented population growth. Yet even before all of these far-reaching developments, land management systems had changed radically over time, and had varied from place to place, producing a constellation of landscape types that were considerably more unstable and variable than those produced by modern conservation methods (Fuller *et al.* 2017). Population fluctuated both locally and nationally, and farming varied in response to markets in meat and grain or the requirements of local and national industries.

Throughout western Europe, semi-natural habitats are often *classified* according to their past exploitation (e.g. Tansley 1939; Ratcliffe 1977; EC 1992), and within our surviving fragments of semi-natural vegetation, conservation management generally aims to continue the 'traditional' practices (those of pre-industrial [c. 1200-1750] land management systems) which originally contributed to their character. However, while current management of wildlife habitats may attempt to mimic aspects of 'traditional' practices, it arguably simplifies their character and thus, as the 'State of Nature Report' (Hayhow *et al.* 2016) has shown, is failing to sustain the species with which they are particularly associated. Indeed, it is likely that, to a significant extent, the conviction that 'traditional' management systems are insufficient for conservation is based on a poor understanding of what these actually involved, and of what they achieved. The management of individual land parcels, including those that we think of today as 'semi-natural', was far from static, and this raises important questions about how we can restore them to a meaningful 'baseline'. More importantly, in failing to understand the real processes which made particular suites of species characteristic of particular places, we may be unable to sustain these into the future. In this article we elucidate the real character of past management systems, and suggest how the principles they embody can be used to develop innovative new conservation techniques.

How did 'historic' land management benefit wildlife?

While we often bemoan the intensification of agriculture which has occurred over recent decades, land-use was actually, in many ways, *more* intensive in the past, but also more complex and heterogeneous. Historic management systems generally shared a number of features that were key to wildlife, which can be summarised as follows (Fuller *et al.* 2017):

- ***Nutrient depletion and intensive ground disturbance.***

On many land parcels, not only was much of the vegetation regularly removed, but also large areas of topsoil. Furthermore, the daily movement of livestock between pastures and fallows served to repeatedly deplete nutrients in the former. Regular physical disturbance created the early successional habitats required by ruderal plants and invertebrates

associated with open ground (Key 2000; Dolman *et al.* 2012), while nutrient depletion would have slowed the subsequent rates of vegetation development, ensuring that suitable habitat was continuously available for species with limited dispersal ability.

- ***Multi-scale habitat heterogeneity.***

Heterogeneity existed at numerous scales, from farming regions down to individual land parcels: this was a fortunate by-product of management, as the spatial juxtaposition of landscape elements and microhabitats is important to many specialist invertebrates with complex life histories. Examples would have included such ecotonal structures as saum and mantel at woodland margins, enriched scrub at heathland margins and terrestrial-wetland transitions (Kirby 1992, 2001; Alexander *et al.* 2005). Fine-scale heterogeneity is also important, such as within grassland and heath where the juxtaposition of exposed mineral soil, short swards, ungrazed nectar resources and well-vegetated overwintering sites are vital to many invertebrates (Dolman *et al.* 2010). In addition, historical modes of exploitation often ensured dynamic mosaics of growth stages, recovering from episodic localised disturbances, as in woods managed by coppicing. In general terms, rigorous exploitation helped to maintain suitable conditions for those species that depend upon both early *and* later successional stages.

- ***Localised stability and continuity.***

Although historic management often involved regular disturbance, many land parcels were characterised by long-term stability in their overall use. In wood-pastures, for example, this benefitted many macro-fungi and species of dung beetles, as well as saproxylic and other species associated with veteran trees, that require continuity of old growth structures (Kirby & Drake 1993). The historic landscape thus provided both stability and continuity, *and* areas of rapid (and often cyclical) change.

- ***Controlled grazing.***

Grazing was, in most circumstances, intense. Livestock underpinned the arable economy by supplying manure and traction, while most farmers attempted to maximise the production of meat, milk, wool and leather. But grazing, especially its timing, was organised in ways which remain insufficiently explored. Moreover, in certain circumstances it was limited or curtailed entirely, the effects of which created the distinctive suites of species that we associate with meadows and coppices.

Below, we describe the historical management of different land types in relation to these four key features, and explain how this would have contributed to their wildlife value.

Heaths and other commons

Lowland heaths are a good example of all this complexity. Most were common land, occupying areas of leached, acid soils, and with vegetation characterised by Heather *Calluna vulgaris* and *Erica* spp., Gorse *Ulex* spp., Broom *Cytisus scoparius* and grasses like Sheep's Fescue *Festuca ovina*. Modern conservation management typically aims to maintain open, treeless landscapes, dominated by Heather, suitable for birds like the Dartford Warbler *Sylvia undata*. But in the past, heaths displayed much deviation from this perceived ideal. Most developed from grazed woodland, often in prehistory

(Groves *et al.* 2012) but sometimes as late as the eighteenth century. Not surprisingly, the line between wood and heath was often blurred, with wood-pasture heaths forming an intermediate and ecotonally complex landscape type once common but now largely lost (Barnes *et al.* 2007).

Heaths and downland were, for centuries, managed in a manner which ensured that they were constantly being depleted of nutrients. Current conservation policy is largely based on light grazing but heaths were usually grazed very intensively in the past, and often by Rabbits *Oryctolagus cuniculus* as well as Sheep (Sheail 1971). They usually served a vital role in 'sheep-corn' farming systems in which sheep were grazed on them by day, and folded (restricted to confined patches, with the locations being periodically changed) on arable land by night, intensively dunging it (Kerridge 1993). This practice was eroded by the adoption of new crops and rotations, and subsequently the use of artificial fertilisers.

In a similar manner, the function of heaths and other 'wastes' as major sources of fuel, something which shaped their character in critical ways, declined as canals and railways spread the use of coal throughout England (Warde & Williamson 2014). Bracken *Pteridium aquilinum*, Heather and Gorse were regularly cut for thatch, fodder and animal bedding, but mainly as fuel (Webb 1998). Thomas Blenerhasset described how Horsford Heath in Norfolk was, in the seventeenth century, 'to Norwich and the Countrye heare as Newcastle coales are to London' (Barrett-Lennard 1921). Areas might be set aside for the extraction of these materials, intermingled with those exploited by grazing. Heather was usually harvested as turves which included both the vegetation and a square of combustible roots, while burrowing Rabbits and the excavation of sand and gravel produced large areas of exposed substrates. In the late sixteenth century Cawston Heath in Norfolk was described as having

'Sand and gravell ... cast upp in such great heapes upon the playne grownd by reason of the digging therof that ther will noe grasse growe upon the said grownde in a verie long tyme' (Whyte 2009).

Heaths were, moreover, sometimes less permanent environments than we usually assume, for they might be ploughed up on a casual basis or on a long rotation, a practice especially characteristic of the East Anglian Breckland but common in other districts. A court held in 1637 heard how the demesne farmer of the manor of Blythburgh and Walberswick in east Suffolk:

Used to plow such parte of the said walke or heath as they would; & when any part thereof was sown with corne, the inhabitants of Walberswick did not put their cattle upon such places soe sowne untill the corne was reaped ... And that it appearses by the rigges and furrowes on most parte of the heath, that the same have usually byn ploughed (Ipswich Record Office HA 30: 50/22/3.1).

Our simplified understanding of 'heaths', based on observations made at a late stage in their history, is thus misleading. Heaths displayed much variation over both space and time; and recurrent disturbance, rather than long-term stability, was a characteristic feature. It is not, therefore, surprising that a biodiversity audit of Breckland revealed that of the 72 Breckland specialists at least 35 require open habitats characterised both by grazing *and* by significant levels of disturbance (Dolman *et al.* 2012). Current agri-environment schemes and reversion programmes which encourage the maintenance of a landscape of permanent and lightly-grazed heath land thus fail to deliver the crucial microhabitats and ecological processes on which biodiversity really depends.

Similar observations apply to other forms of common land. Fens and mires formed in valley peats, for example, were also exploited in complex ways involving a mixture of grazing and the systematic extraction of rough hay, reeds, saw sedge, and peat. Patterns of exploitation similarly changed over time, and varied from location to location, depending on demographic and market conditions, with peat extraction for example declining with the spread of coal use. Conservation management of fens has generally emphasised cutting and vegetation harvest, although in places the re-creation of turf ponds and other active interventions, mimicking the regular disturbances effected by past management, have brought particular conservation benefits.

Woodlands

Not all ‘semi-natural’ environments were originally common land, subject to frequent or continuous grazing, although all were intensively exploited, in complex and varied ways. Private, enclosed woods were managed by regular coppicing, something which maintained both structural and species diversity within limited areas – not least because individual woods were usually divided into separate ‘fells’, cut in turn. Particular herb species, such as Wood Anemone *Anemone nemorosa*, flourished through the creation of cycles of light and shade, but the prominence of such ‘ancient woodland indicators’ also reflected the fact that coppices were amongst the few areas in the pre-industrial countryside which were not subject to any significant degree of grazing, stock being admitted only late in the rotation, if at all (Barnes & Williamson 2015). These plants have poor resistance to grazing and were thus probably uncommon in the grazed woodlands from which most coppices were originally enclosed, in the early middle ages.

As in other contexts, assemblages we value today were largely the consequence of management systems, rather than being in any meaningful sense ‘natural’. The dominance of oak *Quercus* spp. as a timber tree resulted from deliberate selection or planting, and the understorey was also modified by ‘weeding’ unwanted shrubs, and deliberate planting. Ash *Fraxinus excelsior*, in particular, was regularly planted or plashed in vacant spaces (Lowe 1794; Stevenson 1809) and Sallow *Salix* spp. and Hazel *Corylus avellana* also appear to have been widely established in the understorey: a lease of 1612 for South Haw wood in Wood Dalling in Norfolk, drawn up in 1612, bound the lessee to plant sallows in cleared spaces following felling (Norfolk Record Office BUL 2/3, 604X7); the tithe files of 1836 describe how there were 35 acres of coppice wood in Buckenham in the same county, ‘part of which has been newly planted with hazel’ (The National Archives IR 29/5816; Barnes and Williamson 2015). There were both spatial variations, and temporal changes, in management, tied to wider economic systems. In parts of northern and western England, for example, the demand for pit timber ensured the adoption, by the eighteenth century, of particularly long coppice rotations, of twenty years or more (Bailey and Culley 1794).

Hay meadows and arable land

Like woodlands, hay meadows were also usually private, and were grazed only after the farmer had removed the hay. This shaped their biological character, allowing tall, bulky species to flower and set seed, although mowing regimes varied greatly in space and time (Peterken 2013). Arable land similarly needed to be protected from stock for much of the time, although it was invariably grazed

after the harvest and during the fallow period. Much was farmed as *open fields*, containing the strips of many people, subject to varying degrees of communal regulation, and to seasonal common grazing. Open fields were hugely diverse in form (Hall 2014) but in the most developed systems, found in the Midlands, they occupied almost the entire area of each parish. It is sometimes assumed that such landscapes provided few habitats for anything other than arable weeds, but this again is to underrate the complexity of early landscapes. Narrow unploughed ‘balks’ often separated the individual cultivated strips while other areas of unploughed ground, managed as pasture or meadow, were often present, running in ribbons through the furlongs (Williamson *et al.* 2013). Both provided, with the adjacent arable, a fine-grained juxtaposition of perennial and ruderal elements. The balks were subject to episodic grazing during the fallow season and after harvest, providing refuges for stress-tolerant grassland perennials unable to survive in ungrazed closed swards or under conditions of constant grazing. Babbington in 1860 memorably bemoaned how, as a consequence of enclosure in west Cambridgeshire ‘the “balks”, with the various plants which grew upon them’ had been ‘destroyed by the plough. Thus the native plants have suffered ... Where they were once abundant they are now rarely to be found’. This complex landscape of episodically grazed and scuffed grassland, arable and ruderal fallows is entirely missing from the modern repertoire of ‘semi-natural habitats’.

Much farmland in England, especially in the south-east and the west of the country, always lay in hedged fields. Elsewhere, hedges proliferated steadily through the sixteenth, seventeenth and eighteenth centuries, as open fields were progressively enclosed. Like everything else, hedges were managed with remarkable intensity, to ensure that they remained stock-proof, and to provide an abundance of firewood in this fuel-hungry world. Some were *plashed* or *laid* every ten to fifteen years, others coppiced, but either way they were subjected to regular and repeated cycles of change, and provided a high degree of ecological heterogeneity – not least because different hedges on a property would be at a different stage in the cycle of management.

Lessons for the future

Given the present, highly fragmented state of habitats, simply mimicking ‘traditional management’ may not be enough to sustain particular species. Moreover, there are important *conceptual* issues, as we have noted, involved in such an approach. Apart from the fact that much about past practices remains unknown, the manner in which these clearly changed over time makes re-establishment to a particular ‘baseline’ essentially arbitrary. Indeed, the ‘semi-natural habitats’ themselves have an arbitrary character: they are accidents of history, shaped by now redundant economic systems as much as by natural processes (Dolman *et al.* 2012; Williamson 2013). They represent only some of the environments which once existed, and a small sub-set of all those which *might* have been created, and sustained, had different forms of management developed, under different economic, technological or social conditions.

The adoption of a range of complementary strategies in order to maximise opportunities for wildlife in a rapidly changing world would seem to be the most appropriate way forward. One of these would be re-wilding, a particularly suitable approach where extensive areas of land can be deployed for conservation, but less easy in densely-settled regions. A second would be a continuation of the established policy, of managing key habitats along ‘traditional’ lines, although with greater attention paid to the true character of past land use systems. But this brief review also suggests a third route.

Already, large-scale wetland habitats are being actively designed in order to promote certain species, or guilds of species, such as the RSPB's large new reserves on former agricultural land at Lakenheath in Suffolk or Wallasea Island in Essex, where water levels, grazing regimes and vegetation harvesting are directed towards specific conservation objectives (Ausden *et al.* 2014).

But we could go further, especially with terrestrial habitats. The absence of historic stability – of a 'baseline' model for particular habitats - blurs the distinction between the replication of 'tradition' and the adoption of new practices. New systems of intervention could be devised which would create a range of habitats and landscapes which have *never* existed before, but which might be of considerable benefit to certain endangered species or groups of species. Conservation could apply, in novel ways, the key principles which shaped wildlife diversity in managed landscapes in the past. For example, anthropogenic sites with low nutrient status could be created by the addition of mineral or industrial spoil, or by managing mineral spoil heaps or other brownfield land; experiments could be made with the adoption of more diverse physical disturbance practices, especially on heathland but also on former low grade farmland acquired by conservation bodies. Which of these three broad approaches should be adopted in which contexts will depend on many factors, including the availability of land, the resources available for conservation, the requirements of existing wildlife at different sites and the vision of those championing the conservation in the future. However, it is possible that by studying the past we can not only learn how to improve 'traditional' management, but also how to devise quite new modes of intervention.

Box

Historic management: a wildlife panacea?

Past management practices created most of the particular environments we now regard as of key conservation importance, ensuring a diversity of habitats – in close proximity – which can seldom have been matched in the 'wildscape'. But they could also be inimical to biodiversity, and some of the landscape features currently regarded as of high conservation value are likely to have been considerably less frequent in historic times.

Intensive grazing

Intensive grazing would have removed seed-heads, flowering herbs, dead stems and potential invertebrate overwintering sites such as tussocks: it was thus detrimental to many, although not all, invertebrate habitats (Lake *et al.* 2001; Alexander *et al.* 2005; McBride *et al.* 2011).

Dead wood

Demand for fuel was often so high that dead wood in the form of fallen trees and branches must have been rare, judging from the frequency with which people were convicted for 'hedge-breaking' – removal of wood from hedges. Howlett in 1807 described how, in Essex, the traditional method of erecting well-constructed dead hedges to protect the regrowth of the local hedges after coppicing was being abandoned, for they were 'sure to be torn up ...by the destitute poor, who from deficiency of wages, are utterly unable to purchase fuel, and compelled to steal it, or perish with cold' (Young 1807). Nor was there as much dead wood and heart-rot in ancient trees as we usually assume. Most timber trees were felled before they reached fifty years of age (Bailey & Culley 1794) and even pollards, having reached middle-age, were usually taken down and replaced. As Thomas Hale explained in

1756, 'Pollards usually, after some Lopping, grow hollow and decay. ... The Produce of their Head is less, and of slower Growth' (Hale 1756). Middleton, railing against the dominance of old pollards in the hedges of East Anglia, commented disparagingly that these were 'of every age, *under perhaps two hundred years*' [our italics] (Middleton 1798).

Disturbance

The density of people working in the countryside would have been far, far greater than today, rendering many areas unsuitable for those mammals and birds unable to withstand significant levels of disturbance. The very low numbers of deer that evidently existed across most of lowland England before the twentieth century is clear enough testimony to that.

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