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In this 100th issue

Big Issues: Human Population Growth and Climate Change – Beyond Carrying Capacity?

Big Issues: The Hidden Tragedy of the Earth’s Freshwater Ecosystems

Big Ideas: Creating a Mess – The Knepp Rewilding Project
Established in 2001, the Knepp rewilding project in West Sussex has produced astonishing results in terms of recovering habitats and biodiversity. But its potential as a provider of vital ecosystem services – including soil restoration – is greater still and could revolutionise land management in the UK.

Standing on the southern edge of our 3,500-acre rewilding project on a June day, on the brow of one of Knepp Estate’s few elevations, one would be forgiven for imagining oneself gazing on African savannah. This does not look like West Sussex – or anywhere else in England, come to that. The rough, hummocky grassland, a riot of anthills, is punctuated by fists of thorny scrub. Hedgerows have billowed out into swathes of unruly brush. Weaving between them, a filigree of dusty trails signals the wanderings of large herds of ungulates. The air is thick with birdsong, many of them African in origin – swallows, house martins, swifts, lesser whitethroats, chiffchaffs, willow warblers, reed warblers, garden warblers, Cetti’s warblers. You can hear cuckoos, often several at once and, at night, competitive clusters of nightingales send thrilling, unsettling arias into the darkness, interrupted by the occasional nightjar. This is perhaps the only place in the UK where numbers of turtle doves are actually rising.
There is a wildness here, an untrammelled exuberance, pulsing with life, that is so unfamiliar, so essentially un-British, that visitors naturally seek comparisons with foreign parts – the scrublands of the Serengeti in East Africa, or the Deccan in India, perhaps. ‘You expect to turn a corner and see a herd of buffalo or a leopard up a tree’, they say. It feels as though anything could happen here, and sometimes it does. The number of visitations from extremely rare species is rising – last year, a Montagu’s harrier and a black stork flew over, checking us out, a black tern settled on the lake, peregrine falcons nested in a Scots pine for the second time and, in the summer, a red-backed shrike struck up his territory on a hawthorn, catching emperor dragonflies on the wing and impaling them; in February this year, a pair of great white egrets paced the winter water-meadows and, in March, a black redstart appeared in the park. It is almost impossible to remember the time, only fifteen years or so ago, when this landscape was arable – fields of maize, barley, wheat, as far as the eye could see, a virtual desert in terms of biodiversity.

The whys and wherefores
We took the decision to come out of in-hand farming in 2000. For decades, the farm – mixed arable and dairy – had run at a loss but in the 1990s, as the industrialisation of farming and modern technologies widened the gap between farms like ours and massive farms on better land, those losses became unsustainable. Categorised as grade 4, or grade 3 at best, our land has never lent itself to modern intensive production. We are hampered by poor drainage, small, hedged fields and our heavy soil – 300 metres of Low Weald clay over a bedrock of limestone. It is like concrete in summer and in winter, unfathomable porridge, preventing any access to the land by heavy machinery after the first rains of autumn.

The idea to rewild came off the back of the restoration of the 19th century Repton Park around the house. Ploughed up in WW2 as part of Britain’s ‘Dig for Victory’ campaign, the land had been in constant production ever since. In 2001, however, we received funding from the Country Stewardship Scheme to restore the park, providing breathing space for, among other things, veteran oaks suffering from agri-chemical assault. Returning these 140 hectares to permanent pasture, re-seeding with native Low Weald flowers and grasses, and introducing fallow deer as grazers, was a revelation. The following summer we walked knee-deep through oxeye daisies, bird’s-foot trefoil, ragged robin, knapweed, red clover, ladies’ bedstraw, crested dog’s tail and sweet vernal grass, kicking up clouds of butterflies, our ears thrumming with the sound of bumble bees, hoverflies and grasshoppers – something we hadn’t even known we’d been missing. The land itself seemed to be breathing a sigh of relief. For us, it was the psychological breakthrough that allowed us to look at the Estate with fresh eyes, to dare to break with our farming tradition. It showed us the potential of working with the land, rather than constantly battling against it.

Our park restoration coincided with the publication, in 2000, of the ground-breaking book Grazing Ecology and Forest History by the visionary Dutch ecologist Frans Vera (Vera 2000), and a visit to his naturalistic grazing project, the Oostvaardersplassen in Holland, expanded our horizons exponentially. We realised we had the potential to do something much wilder and more exciting than a conventional park restoration in other areas of the Estate. By introducing a suite of other herbivores – Exmoor ponies, Tamworth pigs and old English longhorn cattle – in addition to red deer and fallow deer, and allowing them free-rein to trample, rootle, wallow, puddle, ring-bark, graze, browse and dung where they liked, we could kick-start dynamic natural processes on our land; we could use them to prevent the succession of species-poor closed canopy woods on our ex-arable fields, creating something much more interesting and diverse instead. In effect,
they would be acting as proxies of the tarpan, wild boar and aurochs – some of the big-hitting megafauna that once roamed our countryside disturbing the soil and battling with vegetation succession, transferring seeds and nutrients across the landscape, driving habitat complexity.

The Middle and Northern Blocks (700 acres/283 hectares and 530 acres/215 hectares respectively – see Figure 1) had been part of a fallow deer emparkment in Norman times and this allowed us to attract further funding from Countryside Stewardship in 2003 to roll out the park restoration, enabling us to reseed both these areas with a mix of native grasses, take up internal fencing and gates, ring-fence the boundaries and release free-roaming animals to graze and disturb (Box 1).

But there was no such funding forthcoming for the Southern Block – an area of 1,100 acres (450 hectares – see Figure 1). At a loss as to what to do, and with contract farming actually costing us money, we had no alternative but to step back and leave the land to its own devices. We had begun taking the lowest yielding fields out of production in 2001, and continued in increments over the following five years. Unable to pay for a boundary

**Box 1. Free-roaming animals at Knepp**

The project is divided by roads into three areas (see Figure 1). Each Block entered the rewilding project under different management, in a different year(s) and with a different suite of grazing animals. Consequently the habitat looks very different in each and provides a useful demonstration of grazing management options.

**The Middle Block** (700 acres/283 hectares) kicked off the rewilding project in 2000 with the Countryside Stewardship restoration of Repton Park around the house. Because of its cultural designation the area is retained as traditional parkland, tightly grazed with clear browse-lines on the trees and shrubs. It is currently grazed by 290 fallow deer, 42 red deer, 81 longhorn cattle and 6 Exmoor ponies.

**The Northern Block** (530 acres/215 hectares) also originally received Countryside Stewardship funding as a park restoration, but harking back to the time when Knepp was a Norman deer park. Consequently, we can be less restricted (messier!) here than in Repton Park. Because this whole area was either pasture already or re-seeded with grass, vegetation is, however, taking a long time to get away. Thorny scrub is only just beginning to break out of the hedgerows and colonise the thick, thatchy sward. We have therefore introduced only longhorn cattle here – 108 of them – in order to give vegetation a chance to establish. Once it does, we will introduce ponies, pigs and deer. Hopefully it will eventually have the vegetation complexity and dynamism of the Southern Block.

**The Southern Block** (1,100 acres/450 hectares) supports 385 fallow deer, 48 red deer, 94 longhorn cattle, 10 Exmoor ponies and 7 Tamworth pigs. This area remained unfenced until 2008, with the fields left as they were after their last harvest and not seeded with grass. This allowed a spectacular vegetation pulse to happen over 4-6 years. The Southern Block is now the wildest and woolliest part of the project, with a more equal battle between vegetation succession and animal disturbance creating really exciting new habitats. And because there is so much browsing available here, the area can sustain a larger number of herbivores, including pigs, and still supply plenty of habitat for nightingales, turtle doves and other species.

**Density of animals:** The numbers of herbivores in the project is really a question of judgement and rule of thumb. Too few and areas will turn into species-poor, closed canopy woodland. Too many and the land will revert to relatively uninteresting open grassland. We introduced red deer into the project only when we judged the vegetation was robust enough to withstand this additional heavy-hitting browser.

**Wild range meat:** Culling the herds produces 75 tonnes (live weight) of organic pasture-fed beef, venison and pork per year, bringing in around £120,000. Because the animals live outside all year round, with no supplementary feeding or routine medication like antibiotics, inputs are low and profits are high. Able to ‘self-medicate’ on herbs and shrubs within the project, the animals are healthy and robust, and rarely require veterinary attention. They are managed by a single stockman, who brings in occasional help. Crucially, because the animals are entirely ‘pasture-fed’ their meat is high in omega 3 fatty acids, vitamins A and E, selenium and betacarotene (powerful anti-oxidants), and conjugated linoleic acid (CLA) – one of the most powerful anticarcinogens in nature.
fence and with, therefore, no immediate prospect of introducing herbivores here, we decided to avoid the cost of re-seeding with a native grass mix as we had in the Middle and Northern Blocks. We simply left the fields as they were after the last harvest of maize, wheat, barley or whatever crop they happened to be growing. It was an uneasy and discomforting hiatus – it felt like we were literally turning our backs on the land, pressing pause on our naturalistic grazing experiment – but, ironically, it was rocket-fuel for rewilding.

Scrub – a forgotten resource
Our haphazard process of letting the land go, combined with no re-seeding of grass and a delay in introducing the heavy-hitting herbivores generated opportunities for wildlife that were far more exciting than anything we were doing elsewhere. It wasn’t until 2009 that we received Higher Level Stewardship funding for the whole project, enabling us – at last – to introduce grazing animals into the Southern Block in 2010 (Box 1). By then, unhindered by the kind of impenetrable grassy sward established in the Middle and Northern Blocks, thorny scrub had begun to take off, providing a nursery for jay-planted oak saplings and the spontaneous germination of crab apples and wild service, as well as protective cover for invertebrates, birds and small mammals, and a cornucopia of berries for over-wintering birds. Eruptions of sallow (hybrid willow) germinating in the damp, open soil, has given rise to the largest colony of purple emperor butterflies in the UK. By the time free-roaming animals were introduced there was plenty of browsing as well as grazing available to them, providing them with a richer food supply. The ensuing battle between animal disturbance and vegetation succession has increased habitat complexity even further. This is now by far the wildest area of the rewilding project and source of most of our headline wildlife successes (Box 2) – the part that looks like Africa.

It is also the area that has, understandably, proved most challenging for our neighbours. For many, the natural landscape of Southern England is a patchwork of neatly hedged fields and ditches, small copses and bare, rolling Downland. It is an idyll that has become lodged in our subconscious, invested with nostalgia, an image considered to be balanced and harmonious. Scrubland does not feature anywhere in this idealised country. Demonised by farmers, landowners and gardeners alike, it is considered ‘wasteland’ – messy, worthless, a waste of space, a sign of neglect or mismanagement. But it was not always so, as Knepp’s own field names suggest. Benton’s Gorse, Stub Mead, Faggot Stack Plat, Bramble Field, Broom Field, Cooper Reeds, Broomers Corner and numerous Furzefields (‘furze’ is an old Sussex name for gorse) point to a time when scrub was valued for myriad uses – blackthorn for walking-sticks and sloes; dog rose for rose hips; gorse for animal fodder and fuel for kilns and ovens; juniper for smoking meats and making pencils, its berries for distilling oil and flavouring game and gin; bramble for berries and dye; alder for gunpowder; hawthorn for tool handles; hazel for hurdles and charcoal; willow for basketry, cricket bats and medicine; broom – of course – made excellent brooms.

Roaring red stag with turf on its antlers – like our other herbivores, these great beasts create disturbance within the project, helping counter vegetation succession and creating opportunities for other species. Photo credit Bill Brooks.
Time was – and not so long ago – when scrub was cherished. But almost all the purposes for which it was once used are now satisfied by plastic and mass-produced alternatives. Chainsaws and mechanised diggers have enabled us to eradicate it wherever it dares to appear. One of the richest habitats for nature is now deemed ‘unnatural’. Even conservationists, bent on keeping areas designated for nature in stasis for the preservation of targeted species, often find the morphing, unpredictable, impenetrable character of scrubland hard to countenance. Fortunes are spent every year on its eradication, with scrub-bashing a staple activity of conservation volunteers.

An optimistic future

The accidental reappearance of scrub at Knepp, and the astonishing resurgence of wildlife it has encouraged, in such a short space of time, shows extraordinary potential – and not just for the recovery of rare and declining species. The implications underlying the project are enormous. Knepp shows how rewilding the land leads to other forms of provision vital for the public good – ecosystem services like carbon sequestration, flood mitigation, water storage, air purification, ethical meat production, human health and recreation. It even demonstrates an alternative, low-cost, natural way of re-establishing woodland – without the need for carbon-intensive polypropylene cylinders, tanalised wooden stakes and high-maintenance planting by human hand.

But perhaps most important of all and, inevitably, connected to all the above, it addresses one of the most pressing concerns facing farming today – soil degradation. Centuries of relentlessly ploughing without regard for soil structure, of applying chemicals to the land and destroying soil biota, have led to catastrophic levels of soil erosion. According to the National Farmers’ Union, we have fewer than a hundred harvests left in the country before we have no topsoil left in which to plant crops. At Knepp, the appearance of fruiting fungi such as Boletus mendax (a mycorrhizal mushroom associated with old oaks), and milkcaps and fly agaric in our sallow scrub, as well as common spotted, southern marsh and early purple orchids (plants that depend

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**Box 2. Biodiversity in the Knepp Rewilding Project**

In all, 2,630 species have been recorded at Knepp since rewilding began, of which 75 are nationally notable or rare.

**Headline species:** Knepp’s most surprising successes are nightingales (34 nightingale territories recorded in 2012 compared to nine in the 1999 national nightingale survey); turtle doves (from none at all in the days of farming to 16 singing males recorded in 2017); and purple emperor butterflies (with a UK record-breaking 126 individuals counted on a single day in 2015). Observations of the butterflies’ feeding and breeding behaviour in the scrubland habitat is changing scientific views about this species’ preferences – information of great value to future conservation efforts. In addition, Knepp now hosts all five main UK species of owls – tawny, barn, long-eared owl, short-eared owl and little owl – and 13 out of the UK’s 17 breeding species of bats, including foraging barbastelle bats and a maternity roost of the extremely rare Bechstein’s bat.

**Invertebrates:** Of the 1,611 invertebrates found at Knepp, 34 of these are butterflies, 480 moths, 454 Coleoptera (many of them dung beetles whose populations have exploded thanks to an organic system of livestock ranching), 72 spiders, 56 molluscs, 79 hymenoptera and 19 species of earthworm (an astonishing recovery considering the poor state of Knepp’s soils under intensive agriculture).

**Vascular plants:** 558 vascular plants have been recorded, including the rare adder’s tongue fern, several species of water-starwort, the scarce marsh speedwell, water-violet, greater butterfly orchid and lesser water-parsnip – a species in decline in Sussex.

**Bryophytes & Fungi:** 119 bryophyte species have been identified, including several rarities, suggesting that Knepp may prove to be one of the richest sites for this group in Sussex. Several extremely rare saproxylic fungi have been recorded, including Phellinus robustus, Polyporus quercinus, Ganoderma resinaceum and Buglossoporquercinus.

For more information on species at Knepp see https://knepp.co.uk/yearly-surveys/
Big Ideas: Creating a Mess
– The Knepp Rewilding Project (contd)

on subterranean mycorrhizal fungi) in our former arable fields, is a clear indication that our soils are reviving. In 2013, a study by Imperial College London found an exponential rise in the abundance and variety of all three categories of earthworm – epigeic, endogeic and anecic – compared with neighbouring farmland with the same soils and under the same conventional agriculture as previously at Knepp. In total, we have now found 19 species of earthworm – a diversity that, according to soil scientists, is extraordinarily high.

So Knepp points the way to a low-cost system of soil restoration – a model that could be rolled out across marginal land likely to fall out of agriculture in the post-Brexit shake-up of farming subsidies, and that may prove vital even for Grade 1 agricultural land. Scale, of course, is key in order to allow process-led systems to function but already we are seeing ‘farm clusters’ – groups of small farms – clubbing together to achieve landscape-scale restoration together. Moreover, ‘rewilding’ may not mean dedicating land to a minimal-intervention system in perpetuity. The idea of ‘pop-up Knepps’ – first suggested by a former senior advisor for Natural England – could be a strategy for the future. Parcels of land could be devoted to rewilding for, say, 25-year periods, creating a rotational system of wildlife-rich scrub and restoring the soil, allowing farmers to return one patch to agricultural land again (hopefully to a more sustainable form of agriculture) and rewild another – thus allowing species continued availability of habitat. It could be a way of providing the webbing, running through our farmland, connecting existing conservation sites, to bring about Prof. Sir John Lawton’s vision of ‘more, bigger, better and joined up’ nature in Britain (Lawton et al. 2010).

Knepp shows how rewilding could, if we wish, bring about incalculable public benefits. But if we are to embrace it we need to re-educate our sensibilities.

References


About the Authors
Isabella Tree is an award-winning journalist and author. Her book ‘Wilding – the return of nature to an English farm’, describes the journey of Knepp since her husband Charlie Burrell took the bold decision to move the Estate from intensive farming to rewilding. It was published by Picador on May 3, 2018.

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Charlie Burrell, owner and instigator of the Knepp Wildland project, with a purple emperor butterfly – one of our unexpected successes, previously considered a ‘woodland species’ but which we now know proliferates in a complex habitat of sallow scrub.