

Knepp Wildland Project

Year 10 for the re-wilding project

2011



*This article is adapted and updated from the Knepp Castle Estate
Baseline Ecological Survey by Theresa Greenaway (2006) English
Nature Research Report No.693*



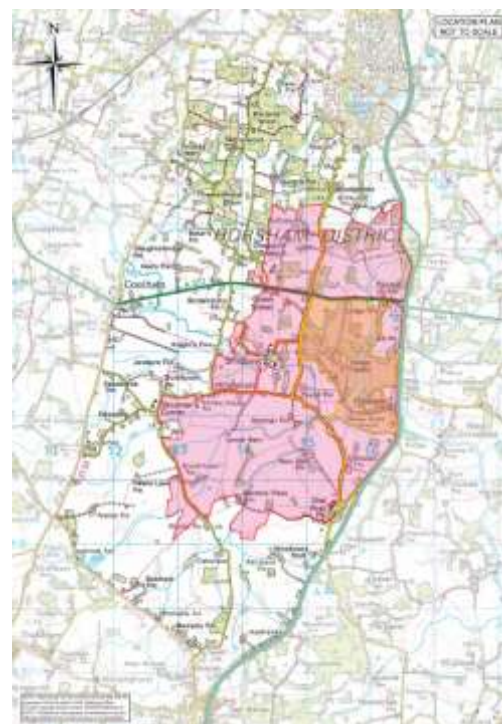


Knepp Castle Estate Wildland Project

The Knepp Castle Estate

The Knepp Castle Estate lies to the south of Horsham, West Sussex. Its long history has resulted in a number of features of archaeological, cultural and geological interest, including the remains of the original 11th century castle. Knepp Castle Estate **originated in the Middle Ages, when it was one of King John's** hunting parks. It now extends to a total of 1,416ha. The original Estate seems to have been a hunting park throughout the medi-aeval period, following which the land was used for iron working in the 16th century. Since this industry fell into decay, the Estate has been an area of farmland and woods. Following World War II, it was increasingly under intensive farming. An unusual feature of the Estate is that its historic field system has largely been retained. Many fields are 4ha or less, and are still bordered by hedgerows.

The Estate lies within the Low Weald Natural Area and has a heavy clay soil. It is traversed by the River Adur and some of its tributaries. Kneppmill Pond is a hammer pond constructed for nearby iron workings prior to 1568. There are two Sites of Nature Conservation Interest (SNCI) on the Estate.



The Knepp Estate lies south of London in West Sussex.

It is about 1,400 hectares and lies in the low weald clay

Vision for Knepp Castle Estate

Development of the vision

Charlie Burrell, the present owner, has had a life-long ambition to recreate the landscape probably designed by Humphry Repton. This was laid out when the modern Knepp Castle was built by the architect John Nash in about 1806 for the Burrell family. As steps were taken to achieve this restoration, the project grew and developed into a far more ambitious scheme to create a landscape-scale wildland in which a variety of large herbivores would roam freely. As far as possible, these animals would **be 'de-domesticated'**. Near-natural grazing would be replicated with the animals utilising the land with as little

human intervention as possible. The intention was that this near-natural grazing system would ultimately include a large part of the Estate.

The Knepp Estate, in conjunction with the Environment Agency and Natural **England, also proposes to 're-wild' the part of the River Adur** crossing the Estate. This involves restoring the Adur floodplain to its natural function and the river itself as far as possible to its original course before canalisation.

The aim of the Wildland Project

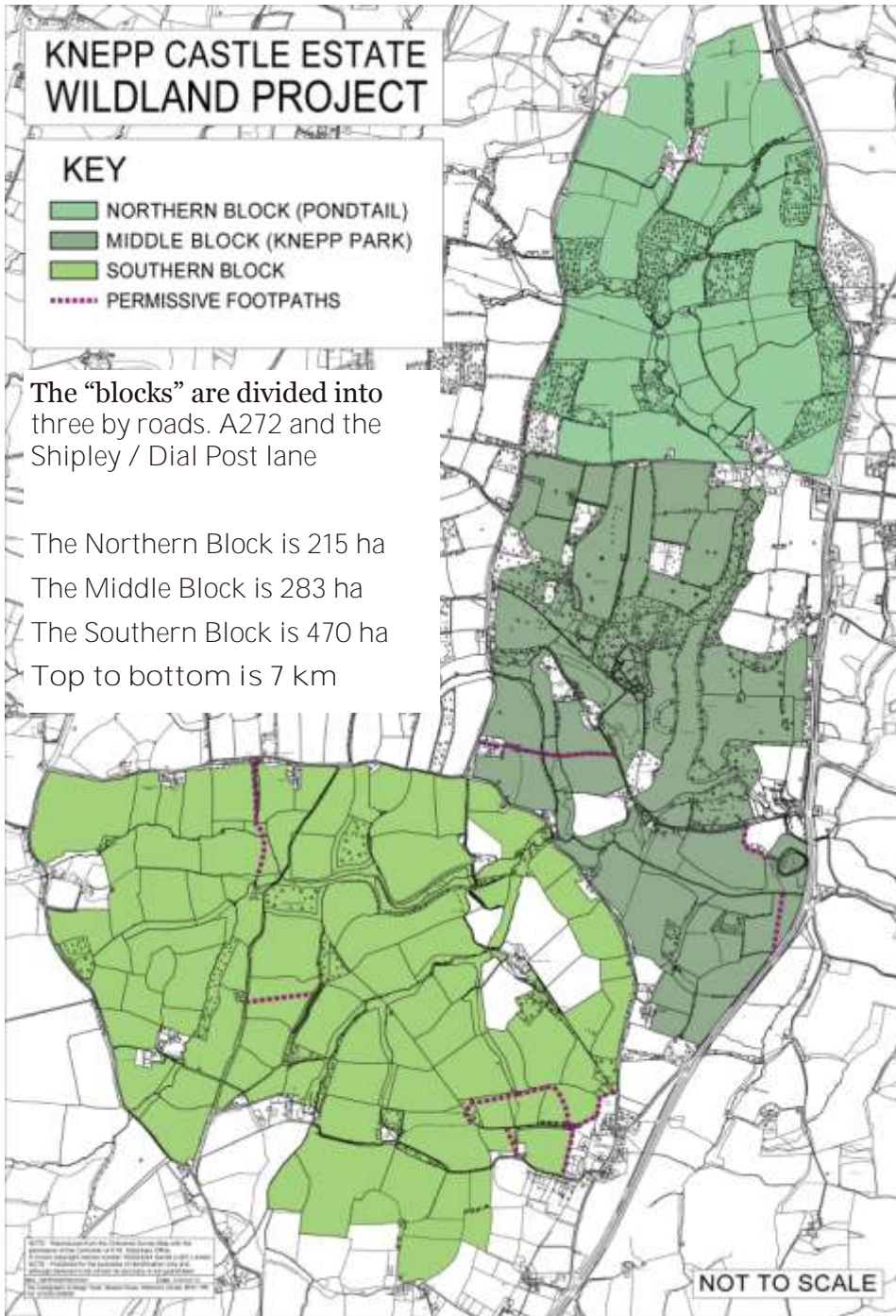
The 'Vision' soon evolved into the Knepp Wildland Project. Unlike the management strategies of nature reserves and designated protected areas, the management of the

Wildland project had no ecological targets. Instead, the overall aim was to record and evaluate changes in the biodiversity and vegetation structure following the reversion of land under intensive arable management to a more natural grazing regime. The research emphasis was, and continues to be, on the processes driving such changes



The 19C castle was built on a rise above the Knepp Mill Pond - built as a hammer pond about 500 years ago. The Burrells have owned the estate for about 220 years.





removed. The ground was ‘sterilised’ by continual cultivation and spraying with herbicide, and subsequently planted with native grasses. About 28ha also included a wild flower seed mix. In 2004, the deer park was extended by a further 106ha, of which approximately 35ha were already in CSS, and the remainder was entered into CSS at this time. This brought the size of the deer park to over 283ha. The additional area of land entered into CSS in 2004 was treated differently. Following the removal of wheat and rape, the seedbeds were cultivated, sprayed with herbicide and drilled with stewardship grasses. In 2005 a second park was created as a further area north of the A272 was entered into CSS, bringing the project area to approximately 322ha.

Fallow deer were introduced from Petworth and Gunton Parks in February 2002, longhorn cattle in June 2003, followed by six Exmoor fillies in November 2003 and a stallion in 2005. In early January 2005, two Tamworth sows and their eight piglets



Public access - The estate is crossed by about 26km of rights of way

and their effects at a landscape scale. It is very rare, especially in southeast England, to have the opportunity to evaluate ecological changes and issues on a site as large as Knepp. This opportunity is immeasurably enhanced by the vision and active participation of its owner Charlie Burrell.

The first stages Knepp Castle Park has

‘historic parkland’ status, so it was possible to revert large areas from arable to parkland under Natural England’s Countryside Stewardship Scheme (CSS), a reversion of historical relevance. The restoration of the deer park began in 2001, when some 202ha of this former park were taken out of arable and commercial grassland. This land was deer fenced and internal boundary fences were



Comparisons between the different landscapes on the Estate



The Northern Block

This was a mixed farm with dairy as its main enterprise.

In the 50's the hedges and rues were removed, and the ditches filled in and piped giving it a feeling of open parkland. The oaks still mark where the hedges were.

It is the most wooded area on the estate with plantations of firs and pine and mixed deciduous woodland. One of these oak woods, Horsham Common, is designated SNCI.

Some of the headwater for the Knepp lake is on this land.



The Middle Block

Believed to have been laid out by Humphrey Repton in the early 1800s, much of this land is Registered Parkland and in 2002 was reclaimed from intensive agriculture **with the help of DEFRA's** Countryside Stewardship.

The centrepiece is the Knepp Lake - a medieval mill pond and SNCI.

The parkland character is **enhanced by vistas 'borrowing' land** from beyond the perimeter.



The Southern Block

A few small woods and narrow river meadows are dispersed amongst hedge-bound fields with an average size of just ten acres. Hedgerow oaks are prevalent also giving the landscape the appearance of being quite densely wooded.

The area was arable-farmed intensively from the 1980s to 2004 and ring fenced in 2009



An early April 2011 scene in the Southern Block - this land was growing wheat in 2005. In 2011 we carried out a tree survey and found 1,300 oaks in this 7ha field, some of them over 2m in height



were introduced. This brought the stocking levels up to an estimate of around 550 animals for summer 2005 – about 500 deer, 6-10 ponies, 16 cattle with 13 calves and 10 sows. Roe deer were already present on the Estate and in the wider countryside, and special gates allow them freedom to roam.



Hedges - the uncut hedges show a low browse line from rabbits but are still marching out into the old field system

In 2009 the project area was extended by a further 470ha to encompass the southwest corner of Knepp Castle Estate. Following the completion of fencing around this third area, 53 head of cattle were put on at the end of May, 10 Exmoor ponies at the end of August and some 20 Tamworth pigs in September. The fencing was mostly funded by Natural England and brought the Wildland Project area to some 1,000ha.

Rational and background Landscape-scale ecology Much attention has traditionally been given to studies on the ecology and behaviour of individual species or small communities, typically on timescales of 3 years or less and spatial scales of 10m or less. This may accord well with constraints integral to the timescale and funding of academic research but the pressing concerns of conservation biology are on longer time scales and vastly greater spatial scales (May 1994).

The ‘Single Large or Several

Small’ debate has been going on since the 1970s and the limitations of both options were summarised by Rosenweig (1995). The concept of ‘**stewardship**’ (Whitbread and Jenman, 1995) is compatible with the management of small reserves. However, doubts about the effectiveness of this strategy to conserve biodiversity, and the high economic cost of maintaining small areas of habitats and populations of species of high conservation concern, are resulting in increasing support for large-scale areas in which natural or near-natural processes drive biodiversity conservation. Linking nature and planning on a landscape scale has numerous advantages over conservation in small fragmented reserves, and is now considered to be an essential approach in the conservation of biodiversity in Europe (Hodder and others 2005).

One of the drivers progressing landscape-scale conservation in Europe has been Natura 2000 which in turn derived from the Habitats Directive (Council Directive on the Conservation of Natural Habitats and Wild Fauna and



Lots of grazing between the scrub. In certain areas of the sward grasses have become the dominant species





From wheat to rich habitat in 5 years



One of the heavy browsers - we think there might be as many as 130 roe in the Southern Block

Flora 92/43/EEC) and the Birds Directive (79/409/EEC). This initiated a European network of protected nature areas. In the Netherlands, the National Ecological Network comprises a spatially coherent network of existing and new nature areas that should be ready by 2018 (Anon, 2004). In Britain, the concept of restoring near-natural ecosystems by near-natural processes was expounded by Whitbread and Jenman in 1995.

Grazing as a driver for landscape scale ecological processes

Frans Vera's study of the effects of grazing on forest history (Vera 2000) has excited much interest, invoked much support, raised a number of issues and provoked considerable discussion if not dissent - all of which have served to enliven and enrich ecological theory and, it is to be hoped, practice. This report is not the place to engage upon an evaluation of Vera's lengthy dissertation, but

quoting the null and alternative hypotheses may be useful:

Null hypothesis: *"That pedunculate and sessile oak and hazel survive in a closed forest and regenerate in gaps in the canopy in accordance with Watt's gap phase model (1947) and Leibundgut's cyclical model (1959, 1978). Large herbivores present in the natural state are dependent on the developments of the vegetation. According to this hypothesis, they do not have an influence on the course of the succession and regeneration of forests."*

Alternative hypothesis: *"That the natural vegetation consists of a mosaic of large and small grasslands, scrub, solitary trees and trees growing in groups (groves), in which the indigenous fauna of large herbivores is essential for the regeneration of species of trees and shrubs which are characteristic in Europe. According to this hypothesis, wood-pasture should be seen as the closest modern analogy of this landscape."*

Vera's thesis itself was based largely on a literature search. **English Nature's interest in Vera's theories resulted in an initial evaluation of his seminal work** (Kirby, 2003) followed by a further report by Hodder and others (2005), which concluded that the case **for Vera's alternative hypothesis** was not proven. Apart from the historical validity (or not) of this hypothe-

sis, there is considerable interest in the use of grazing as a way of generating diverse modern landscapes, inspired to some extent by the Dutch Oostvaardersplassen reserve.

Oostvaardersplassen is one component of the Dutch ecological network. Derived from reclaimed polderland in 1968, it is now a 5,600ha nature reserve (Whitbread & Jenman 1995) that has become one of the most influential examples of management by the implementation of near-natural processes. The role of free-ranging herbivores in this system has inspired a huge amount of interest, influencing theoretical ecology as well as practical conservation. However Oostvaardersplassen is unlikely to have any direct analogue in the UK. It started from a low-



Konik horses in the Oostvaarder-splassen roam free with Heck cattle & red deer on this 5,600 ha Dutch experiment



The pigs know what to value - this footpath was the only bit of former arable fields that had never been ploughed....until they came along

naturalistic as possible within certain constraints.

The need for more research

Although giving a stimulating incentive to ecological theory, **relating Vera's theory to biodiversity conservation** is fraught with complexity. Kirby (2003) cites Olff and others (2002), who question whether releasing free-ranging large grazers in former agricultural areas will really counteract the ongoing loss of biodiversity, as it is intensive agricultural practices themselves that have contributed to this loss. Putting a number of large grazers onto arable reversion land thus feeds into the Vera cycle on a far more impoverished level than would have been the case in pre-industrialised Europe. Rewilding including the restoration of

biodiversity baseline of reclaimed land, inheriting no protected species or priority habitats. The grazing can **truly be said to be 'near-natural' grazing rather than 'conservation grazing'**. By contrast, in the UK, conservation grazing has tended to be implemented to maintain specific open landscapes or historical pasture woodlands.

It might be useful at this point to clarify what is meant by **'naturalistic' or 'near-natural' grazing and 'extensive' or 'conservation' grazing**. These terms do not have formal definitions but depend on compliance or otherwise with the adherence to natural processes, and the following summary is based on Hodder & Bullock (2005): - In naturalistic grazing, there would be no specified grazing density, the grazing animals would be the key ecosystem drivers and natural processes would be allowed to proceed.

Herbivore populations would be limited by resources, fluctuating according to the amount of food available, the vicissitudes of climate and the impacts of parasites and pathogens. The natural process would be seen as an aim in itself. By contrast, the practice of extensive or conservation grazing systems acts as intervention that is aimed at achieving targets for habitat and species composition.

In practice, grazing regimes such as that currently in place at Knepp lie somewhere between these two ends of the scale. The main reason for this is that although large in the context of lowland England reserves, the Knepp Estate is still too small to allow natural population fluctuation, especially in the absence of large predators. The term **'more natural', despite its lack of definition**, is therefore used here, indicating the intention to allow grazing that is as



Nothing seems to trouble daffodils - these wild daffodils outside the pheasant pen have been in the grazed area for 6 years





Here today, gone tomorrow. The top picture was taken in September 2008, the bottom in June 2011. In 2010 about 60 acres of creeping thistle disappeared. We have no idea why. A virus, sap-suckers, mildew or browsing - or a combination of them all?





‘naturalistic’ grazing may be the optimal conservation strategy for the maintenance and restoration of biodiversity in Europe (Vera 2000), but in the short term, it may be unrealistic to expect much increase in biodiversity, certainly as far as the less mobile species are concerned.

The impacts of a given cattle grazing regime on a particular woodland cannot yet be predicted, and Armstrong and others (2003) collated information from cattle-grazed woodlands across the UK. Although focussing on conservation grazing by one kind of herbivore (cattle), this study nevertheless gives a large amount of information gleaned from visited and unvisited grazed woodland sites. Much of this information is subjective and the authors observe that at many sites some form of quantitative

monitoring was undertaken but results seldom analysed or published.

The primary objectives for grazing sites may be very different – for example, wilderness creation, biodiversity conservation or enhancement or to maintain an open habitat such as heathland or wood pasture. In Holland as well as in the UK, grazing has been used as a conservation tool, particularly on open biotopes such as grasslands and heath (Ausden and Treweek 1995; Kuiters 2002; Symes & Day 2003), and increasingly, grazing in woodlands is being considered (Armstrong and others 2003). Extracting rigorous scientific information from these, or monitoring the effects of grazing is hampered both because there has been no inventory of the site prior to the introduction of grazing and also because other man-



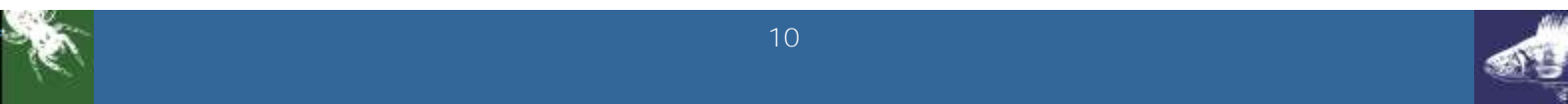
In the foreground is an unprotected oak; in the background, a scrub protected oak. Cattle tend to break the tips off young trees

agement measures are implemented at the same time (Kuiters 2002; Sutherland 1995). Kuiters also comments that there has been little research on the effects of grazing on the underlying processes of soil microclimate, and the resultant knock-on effects on seed germination, seedling recruitment, invertebrates and reptiles. Studies are often limited spatially and temporally, and their results may appear contradictory. Further knowledge is needed on the underlying mechanisms driving habitat dynamics and diversity both with and in the absence of grazing, and this is relevant to all sites at all scales. Grazing-related issues identified by Kuiters (2002) as needing further research can be summarised as follows:

- Research into underlying



The delicate nip from an Exmoor pony has a different browsing effect than the chomping mouth of a cow. This cow is wearing an RSPB sat nav recorder





Different habitats

Enterprise within the wildland - these polo grounds are about 20ha and are grazed by deer within the Middle Block enclosure



A cattle browse-line on sallow in the Southern Block



All over the Southern Block vulnerable species of plant are being protected by thorny species - even creeping thistle has a role, protecting plants and ant hills



From wheat to wildland - interesting plant assemblages are forming in hundreds of hectares stimulated by the effect of browsers and grazers



Winter or summer, the cattle seem to enjoy browsing sallow.

Butterflies - great excitement when Mathew Oates (the purple emperor guru) found the larvae of the UK's largest butterfly widespread on the sallow.

processes influenced or affected by grazing.

- Evaluation of effects of grazing on flora, in relation to soil type, topography and other factors.

- Research on effects of grazing on fauna.

- Further exploration of **Vera's work**

- Role of thorny scrub in woodland regeneration in relation to soil type.

- Grazing density and timing.

Other Issues

Apart from the issues raised above, near-natural grazing brings with it a number of other issues that need to be addressed. Many of these have been identified, and continue to be appraised, in the Oostvaardersplassen project (Van Leewen and others 2003):-

- Animal health – risk to farm livestock from spread of

diseases such as foot-and-mouth disease.

- Human health – transference of diseases such as anthrax to humans.

- Animal welfare – issues include loss of condition in winter, supplementary feeding that reduces the 'near-natural' ethic; dealing with ill, injured or very old animals; use of preventative treatments such as anti-helminthetics.

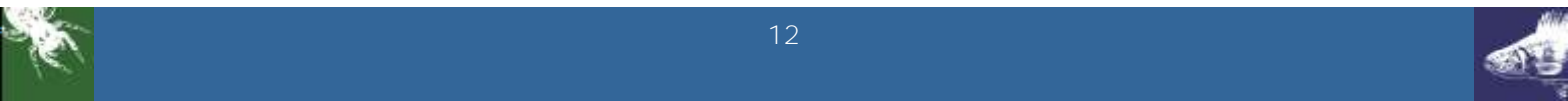
- Control of animal numbers - lack of predators means less fit animals are not weeded out of the system naturally. Stock may suffer progressive loss of condition and health unless they are 'artificially' culled.

- Herbivore corpses - by law these have to be removed.

- Public acceptance – people often reluctant to embrace changes in what they perceive as their 'natural' surroundings.

- Potential danger to humans – some breeds are more aggressive, or more aggressive at particular times of year, than others.

Reconciling the needs of a near-natural grazing regime with these issues is likely to be difficult. Should the aim be for a consistent number year after year, or should an attempt be made to replicate **'boom and bust' cycles** that may have existed naturally? Hard winters, parasite load, predators and summer drought would all have taken their toll in a natural situation, though seasonal migration would have helped to mitigate the adverse impacts of these. Overmars et al. (2003) discuss social structure and heredity in natural grazing. However the more intervention there is with regard to animal numbers and so on, the less the system can be regarded as near-natural. Koene (2002) explores what is meant by **'de-domestication'**. This is an important issue. Humans like the idea of **'natural' herds** of large herbivores but we do not want them to kill us. In the original plans for park restoration, Charlie Burrell rejected red deer introduction because of the danger they might pose to his children. So it is essential in order to gain and maintain public support to differentiate **'wild' in the sense of 'untamed' but not 'wild' in the sense of 'savage'**. Koene asks whether we want the animals to adapt to their natural surroundings or do we want to adapt the sur-





PIGS

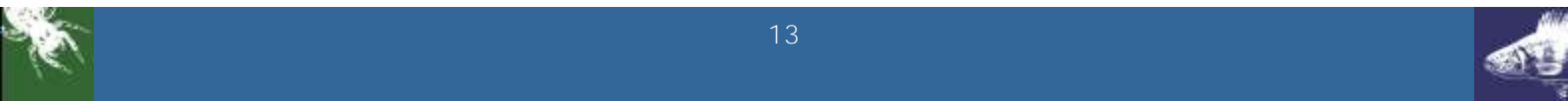
The 2 sows and their piglets ploughed a 5 ha field, it took them the whole winter visiting once a day for an hour or so before moving on to another area.



An aerial shot of the confluence of the river Adur and lancing brook - the pigs have been busy rootling



People love pigs - they seem to feel a real affinity with this animal. We see them as important 'creators of disturbance'





roundings to the animals?

Charlie Burrell also has other factors to take into consideration as the estate is his only form income and must generate sufficient surpluses to fund the non business assets such as the castle itself. The former farmland must continue to be used for trading purposes to qualify for certain tax treatments which means that the animals are sold into the food chain. Enjoyment of the land is also an important aspect of private ownership for the Burrells and some traditional country pursuits such as polo and game shooting exist on a very low-key basis. New business ventures are continually considered and it is hoped that some form of eco tourism may develop alongside the project if it proves financially sustainable.

Near-natural grazing at Knepp
The area at Knepp currently



Trying to work out Grazing Livestock Units (GLU's) for Tamworths is difficult - an adult can probably rootle as much as 10 ha in a winter.

under restoration stands at about 1,000ha, which is about three quarters of the entire Estate. Although the area in the Knepp wildland project is far larger than each of the largest three Sussex Wildlife Trust reserves (Malling Downs 215.5ha, The Mens 159.4ha and Ebernoe / Butcherlands 158ha), it is still comparatively small. Even if the entire Estate were put under a more natural grazing regime, the area involved would only be a quarter of the size of Oostvaardersplassen. Nevertheless, this site provides an opportunity for exploring more naturalistic grazing in the short, medium and long-term.

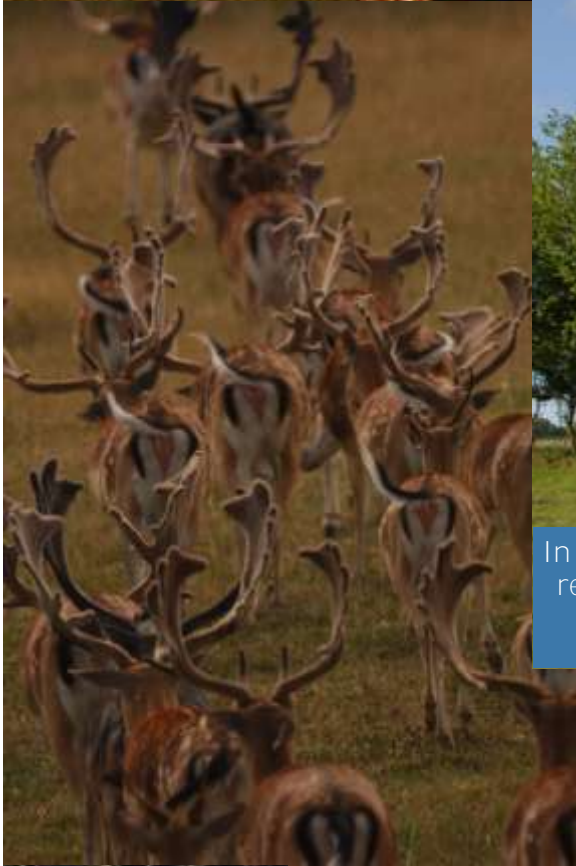
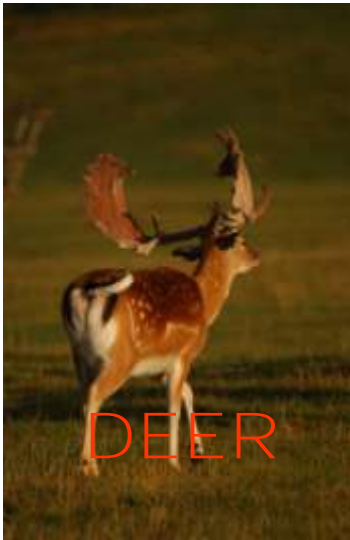
Despite its small size relative to reserves in mainland Europe, Knepp has attracted keen interest from a number of experts, many of who have visited Knepp since the first moves to reinstate the Repton park. The opinions and advice of those such as Hans Kampf (Senior Policy Adviser, Ecosystem and the Environment), Frans Vera (Staatsbosbeheer), Keith Kirby (English Nature), Tony Whitbread (Chief Executive, Sussex Wildlife Trust), Prof. Mick Crawley (Imperial College London University) Matt Heard (Centre for Ecology and Hydrology), Rob Fuller (British Trust for Ornithology), Ted Green and Jill Butler (Ancient Tree Forum and the Woodland Trust) and others have all helped to shape the direction in which the project has developed.

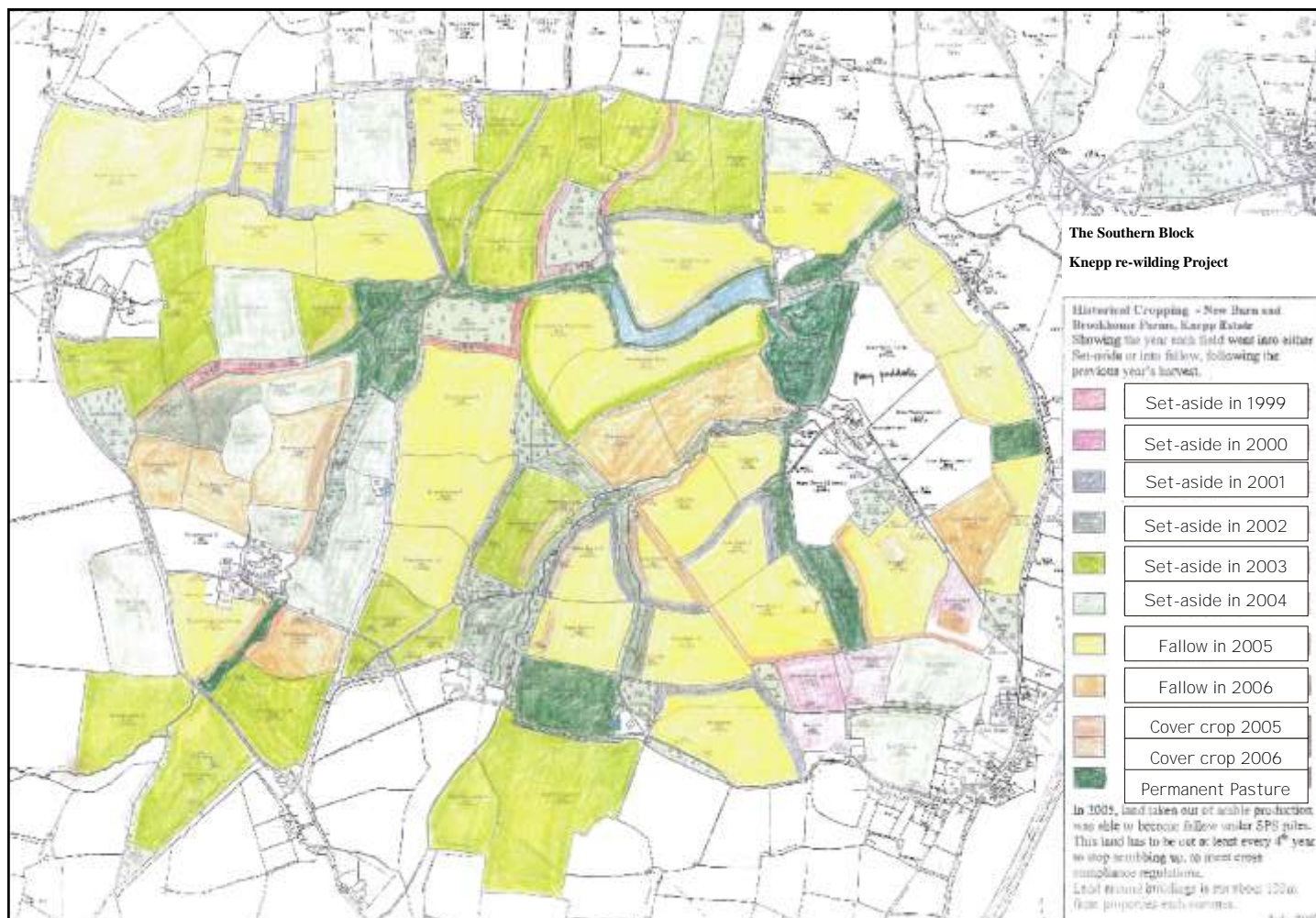


Barbastelle bats are flying 15 miles from the Sussex Wildlife Trust site at the Mens to Knepp to feed over our water lags

The rationale outlined by Whitbread and Jenman (1995) has guided the development of **much of Sussex Wildlife Trust's** recent conservation thinking and has resulted in a number of initiatives that are particularly complementary to the Knepp project. One of the major projects that the Trust is leading is the West Weald Landscape Project. This is focused on a 23,820ha area at the western end of the Low Weald in the Surrey and West Sussex border area. It encompasses Ebernoe Common/ Butcherlands and The Mens, two SACs that are owned by Sussex Wildlife Trust. Chiddingfold Forest SSSI, in the north of the area, straddles the county boundaries and is owned and managed by Forest Enterprise.







This map shows the year in which each field in the Southern block came out of agriculture. The history of each field may dictate what the succession of plants will be. For instance there are 1300 young oaks growing in a field that was taken out of wheat in 2005, but no sign of scrub or trees in a field taken out of maize in 2000.

The West Weald project is focused on promoting the integrated management of the landscape for the benefit of the people and wildlife that live there. It is also working towards using more naturalistic grazing systems in some areas with the ultimate aim of reconnecting isolated landscape features to create an interconnected mosaic of dynamic habitats across core parts of the project area. A comparison of the long-term surveillance on Ebernoe/Butcherlands and Knepp, evaluating the effects that more natural grazing has on vegetation process and biodiversity in these two sites will

be of considerable scientific interest. The sum total of all this work should contribute significantly to our understanding of the role that less rigidly structured grazing systems may play in 21st century landscape management and conservation.

The advantages of the Knepp Estate as a site to explore more extensive grazing may be summarised as follows:-

- with the exception of 2 SNCIs and a few COGS (County Geological Sites) and English Heritage features, no part of Knepp Estate is designated SSSI, SAC or has other protected landscape status.

- there are no rare or protected species for which conservation management measures have already been introduced on site.

- **it benefits from an owner** who is extremely enthusiastic about and supportive of naturalistic grazing and re-wilding schemes.

- the intention to introduce a more natural grazing regime is highly complementary to **SWT's West Weald Landscape Project** and the restoration of the Butcherlands acquisition by natural processes.

- the grazing project will run in tandem with the **River Restoration Centre's and the**



PONIES



The habitat on Exmoor, as driven by the grazing of ponies, sheep and cattle





Aerial survey work on the River Adur floodplain - this summer (2011) the old meanders will be re-dug and the canalised river filled in, woody debris blockages constructed and foot bridges built on a 2 1/2 k stretch of the

Environment Agency's plans to restore and 're-wild' the stretch of the River Adur that crosses the Estate.

□ **Knepp Castle Estate** presents an opportunity for exploring some of the issues raised in both landscape scale conservation and the **issues of 're-wilding' and 'naturalistic grazing'**

The Estate has also qualified **for grants under Defra's** Higher Level Stewardship (HLS) scheme. Biodiversity and habitat information obtained during this project contributed to the production of the Farm Environment Plan that was a requirement of the HLS application.

Is this aim being realised?

With so much potential for research and survey, keeping the Wildland Project to its original brief has presented challenges. As the project has developed, it has been necessary to modify, adjust or extend the original objectives. Constraints imposed by animal welfare compliance and

the absence of large predators have had considerable impact **on the concept of 'near natural' grazing.** With the exception of deer, livestock has to be registered, maintained and slaughtered in accordance with UK legislation. The two very cold episodes of winter weather in January 2010 and again in December 2010 meant that stock had to be given supplementary feed, contrary to the original intention. The lack of large natural predators means that there is no natural herbivore control. In the case of cattle and pigs, this can be mimicked by culling for the market. Ponies are controlled by limiting stallion activity, and deer are controlled by stalking. All sales of meat are for human consumption and whilst the estate hopes that one day each animal based enterprise will be financially sustainable, their primary raison d'être is their role in the project, not profit.

Now some 10 years since the beginning of the project and with 6 years ecological surveillance, it is clear that deer numbers in the Repton Park were too high and have caused the woodland understorey to become depleted. The project originally



Young trees incur a certain amount of damage from cattle using them as scratching posts

intended that deer would be used to "thin" the woods as the project moved away from traditional woodland management towards wood pasture, in line with the parkland landscape objectives of the original Countryside Stewardship Scheme. However as the estate has shifted emphasis away from pure landscape towards biodiversity, deer numbers have been reduced from 280 in March 2010 to 170 in 2011. Aside from the usual annual cull, some animals were caught and relocated to the southern block where about 80 fallow deer have joined the longhorns. Arriving at a balance between deer numbers and an appropriate level of grazing is likely to be an ongoing issue.

Other unforeseen issues include the proliferation of ragwort and thistles, scrub devel-

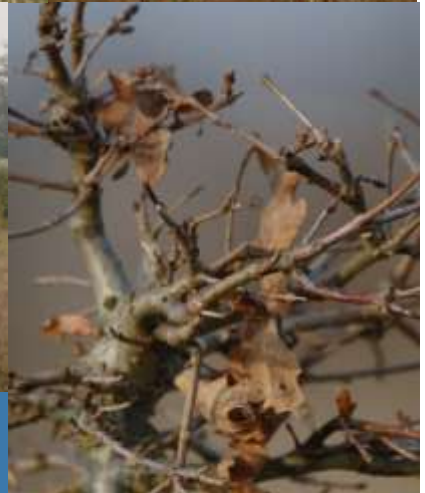
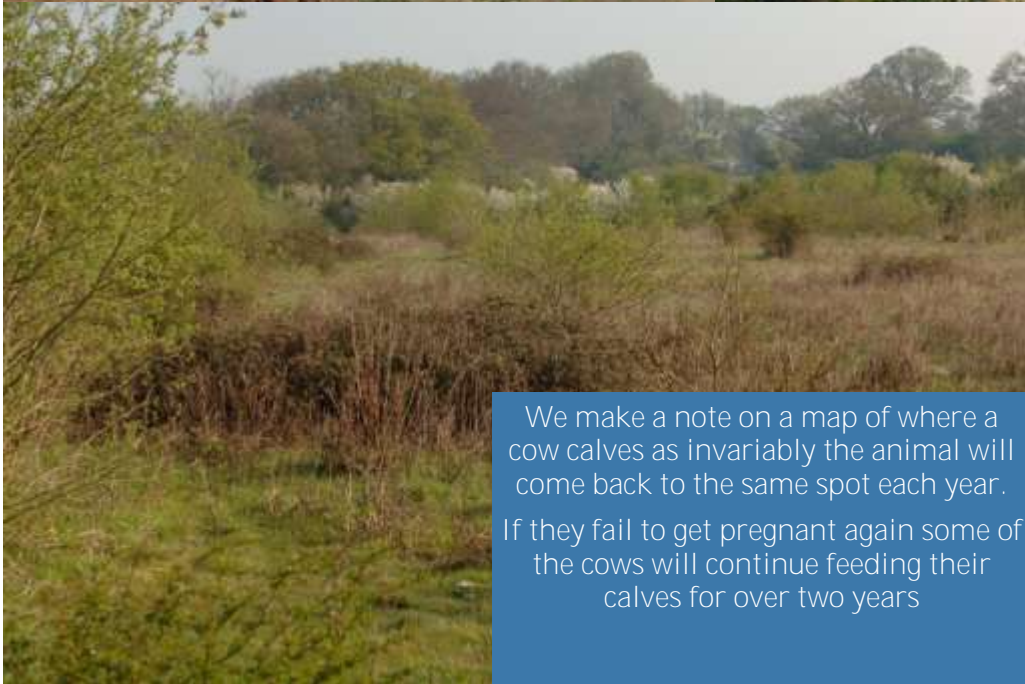


Public and animals - both have lots to learn...

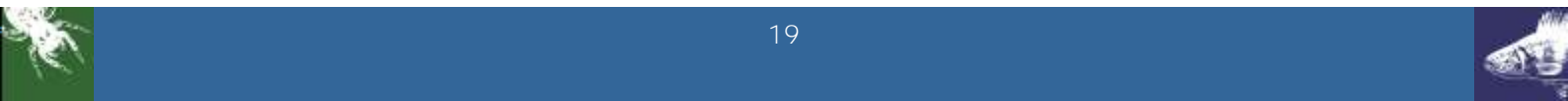




CATTLE



We make a note on a map of where a cow calves as invariably the animal will come back to the same spot each year. If they fail to get pregnant again some of the cows will continue feeding their calves for over two years

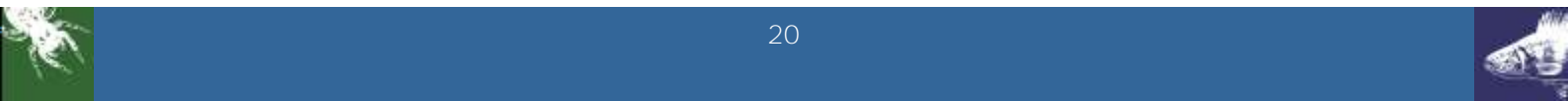




Cattle are great at breaking up vegetation - they snap oaks in two, make paths through scrub, create a high browse line on the woody shrubs & trees, spread seeds in their dung and on their hooves and fur, and stimulate grass growth by grazing



Oaks in the grassland in the Northern Block tend to be browsed each year - but each year, despite the odds, they get a little bigger





opment, and the attitude of a minority of adjacent land-owners. The high visibility of toxic ragwort caused much concern among horse or livestock owning neighbours. As an Injurious Weed under the Weeds Act 1959, Knepp has to comply with the law, and ragwort is now monitored annually. Scrub is an essential and valuable component of the changing vegetation away from arable but its increase in some parts of the Estate is in conflict with meeting the requirements of the Single Farm Payment. Changes in the appearance of the land after the cessation of intensive farming have also not pleased some people.

But there are signs that there are gradual improvements in vegetation structure and wildlife diversity. To date, the greatest changes in vegetation structure are seen in the southern block of land, which was taken out of arable production some years before it was grazed. This has given time for scrub to develop prior to any grazing pressure. The diversity of breeding birds appears to be increasing, including a number of birds on the Red List of conservation concern such as lapwings and turtle doves. Another sign of improving habitat was indicated by the results of a breeding bat survey in 2009 (Greenaway F., 2009). All bat species have different ecological requirements, but in general, male bats occupy less favourable habitats than females, leaving the most productive foraging areas to the breeding and lac-

tating female bats. One of the **species recorded, Natterer's bat**, forages extensively on insects associated with grazing animals and their dung. The presence of almost equal numbers of male and female **Natterer's bats recorded in 2009** suggests that the status of the foraging habitat is changing – perhaps indicating that the more natural grazing regime is having a positive effect on the breeding success. A repeat survey after 5 years have elapsed will allow a firmer assessment of bat population changes.

The first major evaluation of the Wildland project is due to be carried out in 2015, ten years after the initial baseline ecological survey. This will bring together and evaluate ten years of ecological surveillance, and could also include the wider issues associated with more natural grazing strategies such as economic viability, community support and animal welfare.

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June 2011.

This article is adapted and updated from the Knepp Castle Estate Baseline Ecological Survey (Greenaway, T.E. (2006) English Nature Research Report No.693.

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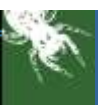
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Five and a half kilometres of wetted-up floodplain have been created already with further plans afoot. 2 1/2 kilometres of the river Adur are about to be naturalized in an Environment Agency project





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Food security - meat from the wildland project

The eventual output from the project will depend on the ecology but we anticipate the output to be around 36 tonnes of meat a year.

Single suckler herd - a 100 cow herd produces around 65 saleable steers and heifers a year, with an average dead weight of 380 kg or a total 24,700 kg

Fallow deer - a herd of around 300 animals with a ratio of 40% bucks produces around 4,200 kg of venison

Pigs - we produce around 40 to 50 pigs a year from 6 breeding sows - this gives us around 1,700 kg of pork

Exmoor ponies - even **though the Exmoors don't get eaten** it is helpful to know the sort of weight produced from the wildland. Surplus animals will be sold from a herd of 20 breeding females. This equates to around 6,000 kg of pony.

In round figures we will be producing around 36,600 kg of meat a year from the project.







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