

## Knepp Exmoor Project - Exmoor Herd Strategy

Rina Quinlan, Version 1, 31 December 2019

### Introduction

Knepp Wildlands is a pioneering rewilding project consisting of 3,500 acres of former arable and dairy farmland in the Sussex low weald. With farming pressures removed, the estate has been returned to nature and is transforming to a self-willed ecosystem. In order to restore natural processes, large herbivores have been reintroduced, acting as proxies for missing species that would have been abundant in the past. These 'ecosystem drivers' cause natural disturbance and create a mosaic of habitats by grazing, browsing, trampling and rootling through the soil and vegetation as well as dispersing nutrients and seeds. Three species of deer, cattle, horses and pigs roam the estate freely, each acting in a different way to one another to impact the environment.

The Knepp Estate is split geographically into three different blocks, southern, middle and northern and historical use, herbivore assemblage and methodology of restoration has meant each block is unique in both habitat and aesthetic value. Presently a herd of purebred Exmoor ponies acting as proxies for the extinct wild horse, the tarpan, are kept in the middle block, which supports a Repton park like landscape. Knepp would like to expand this pedigree herd of 19, which is made up of a stallion and 11 mares with seven 2019 foals at foot; as well as introducing further horses into the southern block, a site they formally occupied, which hosts a mosaic of thorny scrub, open pasture and woody groves. Public bridleways and permissive riding paths run throughout the estate and consequently Knepp has to ensure that care is taken to monitor the herds behaviour around ridden horses.

### Why horses? What contribution do equines make to herbivore assemblage and what benefits do they bring?

Large herbivores such as horses and cattle in central and western Europe were previously considered non-native livestock introduced by man and were subsequently removed during the nineteenth and twentieth century (Vera et al, 2006), causing wood pastures to transform into closed forests considered analogous of primaeval vegetation. However, ancestors of modern day cattle and horses, aurochs and tarpans, would have been historically present in large numbers and therefore would have disturbed these primaeval ecosystems, helping to maintain a wood pasture landscape in place of closed forest (Vera et al, 2006). The tarpan was wide-spread throughout Europe until the late Holocene (Naundrup & Svenning, 2015) and much of Europe's flora and fauna would have evolved in a landscape of wild horses.

On a more local level ruins from the old Knepp castle dating back to 12<sup>th</sup> century form part of the now Repton Park landscape of the middle block. The old Knepp Castle was built by the de Braose family who also owned hunting rights at nearby Sedgwick Castle which is described in 1262 as a park of 400 acres with wild horses (Sedgwick Park, 2011) suggesting that in the hunting parks of the low weald, wild horses quite likely formed part of the ecology of the landscape.

Contrary to ruminants such as cattle or deer which are fore-gut fermenters, horses are hind-gut fermenters that require a large amount of low quality high fibre forage, predominantly made up of graminoid vegetation such as grasses (Ransom & Kaczensky, 2016). Powerful sets of incisor teeth and flexible lips enable horses to graze closer to the ground and cut fibrous stems. This is in contrast to ruminants who do not have upper incisors and in part explains how these conversing adaptations,

and subsequent complimentary grazing strategies, have facilitated an ancient and beneficial relationship between bovines and equines (Odadi et al, 2011). Horses will selectively graze vegetation such as grasses, sedges and herbs including coarse, highly abrasive grasses, helping to establish a mosaic of low and high vegetation in the landscape (Naundrup & Svenning, 2015). Horses will also browse other plants including woody vegetation, especially when grasses are limited (Fraser et al, 2019). Linnartz and Meissner (2014) note that horses 'love debarking poplars, willows, spruce and beech; thus opening up patches of closed forest'. This heterogeneity of habitat facilitates other species including invertebrates and small vertebrates as well as other herbaceous plants (Naundrup & Svenning, 2015).

Modern day and peer reviewed assessment on the ecological benefits of horses and their impact upon vegetation in rewilding areas is limited but recent research carried out by the Dartmoor Pony Heritage Trust (DPHT) and the University of Plymouth on conservation grazing with ponies at Bellever Forest in Dartmoor concluded that ponies are suitable for conservation grazing schemes throughout the country. The research showed that increased grazing and trampling from ponies led to a reduction in *Molinia* cover and sward height, which in turn facilitated plant species diversity (DPHT, 2019). The study concludes that sufficient evidence has been found that suitable type ponies can support biodiversity and tackle dominating species such as *Molinia*. Due to the nature of being a 'self-willed' rewilding project Knepp does not target the spread or removal of any particular vegetation species, however, the introduction of large herbivores facilitates both reduction in dominant species of vegetation and dispersal of seeds and nutrients that facilitate germination as well as provide the opportunity for research on the relationship between large herbivores and vegetation in a rewilding context. Although further research is still needed, studies on the equine biome is shedding light on links between horses' diet and hind gut health and proposes that bitter plants such as bracken, ivy and ferns help increase equine metabolic bacteria (Hughes, 2017). Metabolic diseases such as laminitis in horses can provide a challenge for conservation grazing programmes, and further knowledge of hind gut bacteria could therefore play a part in improving the health of individual within herds as well as help control dominant plant species.

As well as the recycling of nutrients, the provision of dung is far from a waste product with many species benefitting from the large herbivore assemblage at Knepp, showing preference or extensive use of horse dung. Birds such as sparrow (*Passer domesticus*), yellowhammer (*Emberiza citrinella*), chaffinch (*Fringilla coelebs*) and linnet (*Linaria cannabina*) will take seeds from horse manure (Jones, 2017). The megafauna of the dung beetle variety, the Violet Dor Beetle (*Geotrupes mutator*), also with a preference for horse dung was recorded in Sussex for the first time in 50 years, appearing at Knepp twice in 2016 (Green, 2016). Other relationships are slightly more subtle such as the lesser earwig (*Labia minor*) that feeds on the mycelia of moulds found on horse dung (Jones, 2017). The Nail Fungus (*Poronia punctate*) is found only on horse dung and is very rare in Britain compared to 100 years ago, thought due to the increased use of synthetic chemicals such as those used in horse wormers for domesticated horses (First Nature, 2019). The first record for Sussex dates back to 15 years ago on the near by Ashdown Forest so the provision of horse dung without added chemicals could provide the right conditions for the return of this fungus to its former glory. Jones (2017) observes horse dung as having a "labyrinthine convolutedness offering a much more complex surface" in comparison to cow dung which are "really just thick pancakes". With the upper boluses of horse dung teeming with small insects such as moth flies (*Psychodidae spp.*), lesser dung flies (*Sphaeroceridae spp.*) and fungus midges (*Sciaridae spp.*) and the bulk being favoured by a large range of dung beetles, Jones goes on to vote horse dung as "the entomologist's top choice for a day spent dunging".

### Why Exmoor's & why pedigree?

Exmoor ponies have been part of the Knepp story since their introduction in 2003, an excerpt from the Knepp website (n.d.) substantiates their arrival with an explanation of their credible conservation grazing characteristics; "It is armoured for the harshest conditions, with deep chest, large heart and lungs, broad back, strong legs and hard hooves; big heads with small nostrils for breathing freezing air; strong jaws and long, deep-rooted teeth to macerate the toughest fibres; thick manes and long forelocks, and fanned, water-deflecting 'ice-tails'. In winter, they grow an insulating woolly under-layer beneath an outer coating of long, water-resistant oily hair. Their eyelids are insulated with fatty pads to deflect rain and snow and, perhaps, to protect from the claws of predators that would have once roamed the moors."

Exmoor ponies are categorised as 'Endangered; (300 to 500)' by the Rare Breeds Survival Trust (RBST) (n.d.) an organisation that promotes the use of native breeds in conservation grazing, therefore, use of Exmoor ponies at Knepp is likely to be supported by the local and national rural community and all those with a wish to see this historic breed revived in the 21<sup>st</sup> century

A recent project collaboration from the RBST, Exmoor National Park Authority and other stakeholders led by Tim Morris (DEFRA Chief Vet and RBST trustee), has begun to unravel the genetic origin and diversity of Exmoor ponies to help promote a sustainable approach at saving the breed. Although genetic research has not supported the theory that Exmoor ponies are direct descendants from the extinct tarpan (Green, 2013), there is no doubt that they demonstrate a distinct likeness to images of horses etched on to the walls of caves at Lascaux in the Dordogne, Palaeolithic cave paintings that date back to approximately 17,000 years ago.

Furthermore, in a handbook for rewilding horses in Europe, Linnartz and Meissner (2014) recommend using 'regional and well-adapted individuals' when considering horses for rewilding and those that are adept at living in the wild, citing Exmoor ponies as most suitable for Northwest Europe and England. Although it is not deemed important to value pedigrees in a rewilding herd care should be given to not breed from individuals with white markings and/or unnatural colouring, characteristics tested against when registering Exmoor ponies. They also recommend that animals should be 'readily available' and do not upset local opinion.

Ponies that are categorised as semi-wild are thought particularly suited to conservation grazing schemes because natural rather than artificial selection has shaped their genomes. Utilising native ponies for conservation grazing could both support the protection of rare equine genotypes whilst helping to achieve increases in biodiversity (Fraser et al, 2019). The result being hardier, more robust individuals that are able to live relatively unsupported from human interference.

### Target numbers for the middle block by December 2025?

Linnartz and Meissner (2014) recommend forming a social herd with mixed ages that are used to living in the wild and are adapted to the local terrain.

Carol Laidlaw, manager of a free-roaming konik herd at National Trust property, Wicken Fen, Cambridgeshire notes that forming a stable natural herd structure helps to create an inward looking herd (Personal observation). Feral horses will live as one large herd but can have multiple groups within such as family harems, bachelor bands and mixed sex bands of sub-adults. Family harems usually include one or more adult males, between one to ten adult females and recent offspring (Laidlaw, 2018) and will demonstrate long-term stable associations. This will be an important facet to managing free roaming equines at Knepp in order to discourage interactions with visiting horse

riders to the estate. By introducing multiple herds, it is hoped that the Exmoor ponies will interact primarily with one another, and such behaviour will be closely monitored through the Knepp Exmoor Project (KEP) which works with local riders who have subscribed to riding additional permissive routes throughout the estate and will report back on Exmoor behaviour experienced during their visits.

There are currently 19 Exmoor ponies at Knepp residing in the middle block and running as one herd, consisting of 11 mares, three fillies, four colt foals and a licensed stallion, Anchor Roebuck.

Following monitoring of current behaviour, it is hoped that the entire herd will be moved into the southern block during Autumn/Winter 2020. We then propose the introduction of a newly purchased registered breeding herd of approximately 10 individuals into the middle block once the existing herd has moved.

Foals will continue to be registered and youngstock of age will be moved back into the middle block for the colts to form a bachelor band and the young unrelated fillies to join the middle block main breeding herd, enabling the middle block herd to expand to circa 25-30 individuals by 2025. This herd will comprise of the main stallion and his harem, a bachelor band as well as the likelihood of a younger home bred colt forming his own harem with youngstock when ready from the newly introduced pedigree stallion. Horses from the middle block will then feed into the southern block based on age, behaviour, genetic diversity and social bonds. It is hoped that separate but inward looking horse herds will be established and mostly self-managed in both blocks.

In order to be registered with the Exmoor Pony Society foals are inspected each year and entered into Section 1 or Section X of the studbook according to the rules of the society and meeting with EU/DEFRA legislation (The Exmoor Pony Society, 2016). Ponies that are entered into Section X of the studbook have not met the breed standards and are not recommended to breed from but are eligible for reinspection. Furthermore, colts can be inspected from two years of age in order to achieve licensed stallion status with the society. Youngstock who have not met the breed standard for the studbook will be retained in the southern block or other opportunities for sale for other conservation grazing projects or possibly meat produce will be explored.

As part of the Knepp Exmoor strategy further observations will be made of the herd and research will be conducted in partnership with local and national universities on their ecology and behaviour. A forum consisting of national and global experts on conservation grazing with horses will be formed in order to share experience on such topics as practicalities of managing breeding free-roaming equines and public safety.

## References

Dartmoor Pony Heritage Trust (DPHT). (2019) 'Press Release: Dartmoor pony research evidences the benefits of equines as conservation grazers: aims to influence government policy' [Online]. Available at <https://www.dpht.co.uk/news> (Accessed 31 December 2019).

First Nature (2019) *Poronia punctata* (L.) Fr. - Nail Fungus [Online]. Available at <https://www.first-nature.com/fungi/poronia-punctata.php> (Accessed 03 January 2020).

Fraser, M. D., Stanley, C. R., Hegarty, M. J., (2019) 'Recognising the potential role of native ponies in conservation management', *Biological Conservation*, vol. 235, pp. 112-118 [Online]. Available at <https://www.sciencedirect.com/science/article/abs/pii/S0006320718314800?via%3Dihub> (Accessed 18 December 2019).

Green, P. (2013). 'The free-living ponies within the Exmoor National Park: their status, welfare and future - A Report to The Exmoor Moorland Landscape Partnership' [Online]. Available at [http://www.exmoor-nationalpark.gov.uk/\\_data/assets/pdf\\_file/0017/431063/Final-PDF-Pony-Report-condensed.pdf](http://www.exmoor-nationalpark.gov.uk/_data/assets/pdf_file/0017/431063/Final-PDF-Pony-Report-condensed.pdf) (Accessed 18 December 2019).

Green, P. (2016) '*Knepp Wildland Update*', a report authored by Knepp ecologist, Penny Green.

Hughes, C. (2017) *Equibiome, Feeding for a Healthy Hind Gut - Best Equine Prebiotics* [Online]. Available at <https://www.equibiome.org/post/manage-your-blog-from-your-live-site> (Accessed 15 December 2019).

Jones, R. (2017) *Call of Nature: The Secret life of Dung*, Exeter, Pelagic Publishing.

Knepp Wildland (n.d.) *Exmoor Ponies* [Online]. Available at <https://knepp.co.uk/exmoor-ponie> (Accessed 15 December 2019).

Laidlaw, C. (2018) '*The behaviour of free-roaming herds of highland cattle and Konik polski at Wicken Fen nature reserve*', a thesis submitted to Anglia Ruskin University for the degree of Master of Philosophy.

Linnartz, L. Meissner, R. (2014) *Rewilding horses in Europe: Background and guidelines—a living document*. The Netherlands: Rewilding Europe.

Naundrup, P. J., Svenning, J.C. (2015) 'A geographic Assessment of the Global Scope for Rewilding with Wild-Living Horses (*Equus ferus*)', *PLoS ONE*, vol. 10(7), [Online]. Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4503665/> (Accessed 18 December 2019).

Odadi, O. O., Jain, M., Van Wieren, S. E., Prins, H. H.T., Rubenstein, D. I. (2011) 'Facilitation between bovids and equids on an African savanna', *Evolutionary Ecology Research*, vol. 13, pp.237-252.

Ransom, J.I., Kaczensky, P., (2016) *Wild Equids: Ecology, Management, and Conservation*, Maryland, John Hopkins University Press.

RBST (n.d.) *Equine Watchlist* [Online]. Available at <https://www.rbst.org.uk/Pages/Category/equine-watchlist> (Accessed 24 December 2019).

Sedgwick Park (2011) *The Castle* [Online]. Available at <http://www.sedgwickpark.com/index.php?page=the-castle> (Accessed 12 December 2019).

The Exmoor Pony Society, (2016) *Breeding Information* [Online]. Available at <https://www.exmoorponysociety.org.uk/breeding/information/> (Accessed 09 December 2019).

Vera, F.W.M., Bakker, E. S., Olff, H. (2006) 'Large herbivores: missing partners of western European light-demanding tree and shrub species?' in Danell, K. Bergström, R. Duncan, P. Pastor. (eds) *Large herbivore ecology, ecosystem dynamics and conservation*, Cambridge, UK: Cambridge University Press, pp. 203-231.