CIEEM in practice

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Feature

Supporting the Transition to Sustainable Equine Land Management: Applying Regenerative Principles to Equine Landholdings

Horses have evolved to forage across large rangelands, on moorlands, through forests and wetlands. But we are much more accustomed to seeing our domestic equines kept on old cattle pasture, on short, stressed grasslands, complete with muddy gateways and well-worn tracks along the fence line. Or perhaps they are kept in a stable to 'save' the field for the next grazing season. Both our horses and our land are suffering from this approach, but it doesn't have to be the case. The needs of land and equine welfare are not all that different. By managing our horses in a manner that replicates their natural environment it is possible to bring species richness back to our horse paddocks and forget the old days of 'horse-sick', muddy and 'weed'-infested paddocks.

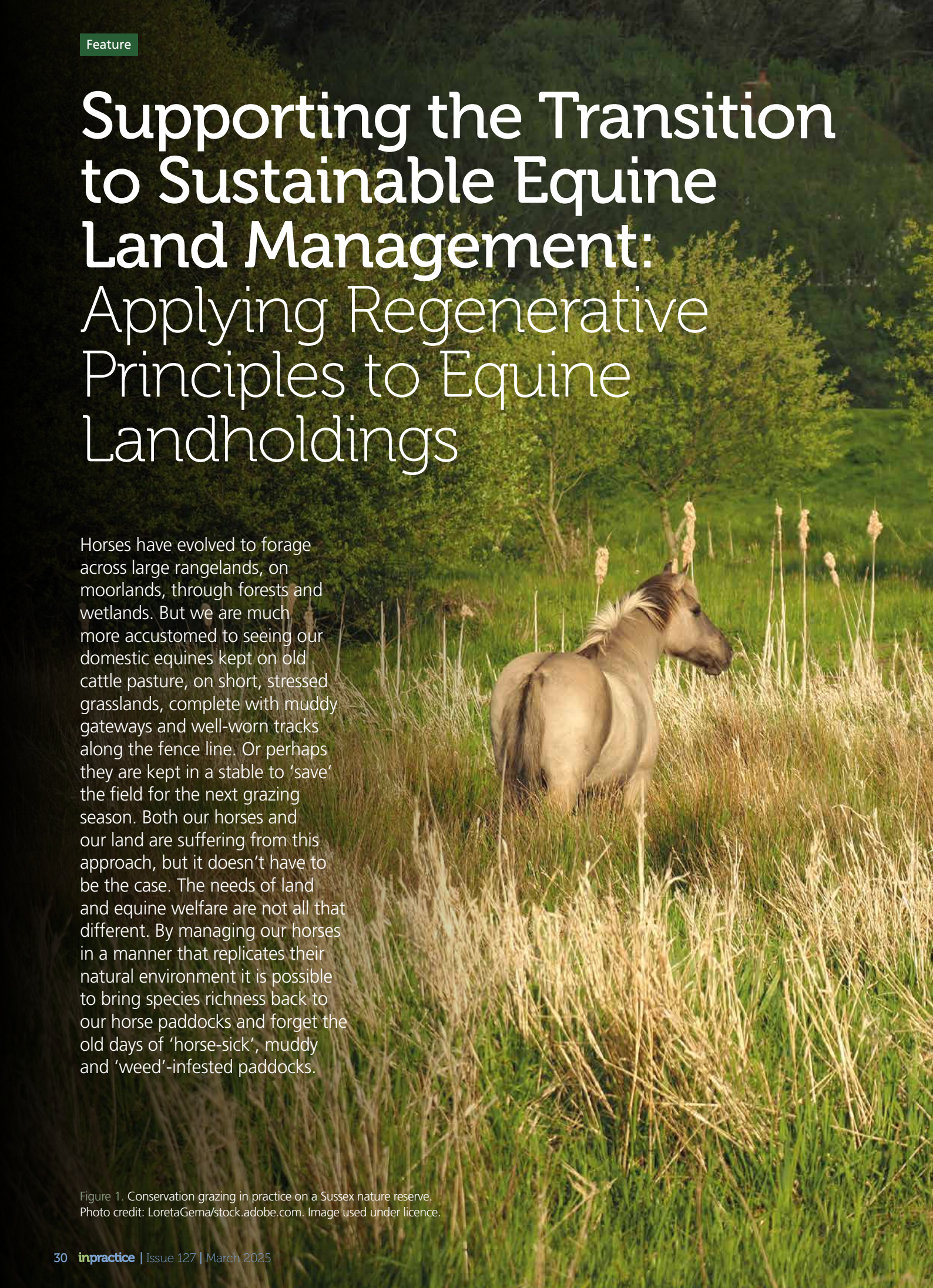

Figure 1. Conservation grazing in practice on a Sussex nature reserve. Photo credit: LoretaGema/stock.adobe.com. Image used under licence.

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Introduction

There is an estimated 4.5 million ha of grassland in the UK (Wildlife Trusts 2024), less than 1% of which is considered species-rich (Plantlife 2024) . This has resulted in dedicated efforts from environmental non-governmental organisations, such as the Wildlife Trusts, Plantlife and even the Woodland Trust, to develop conservation action plans to conserve and enhance grasslands nationwide. Agri-environment schemes, such as Countryside Stewardship and Sustainable Farming Incentive (SFI), provide funding and encouragement for agricultural landowners and tenants to enhance the quality of their grassland through changes in management, such as appropriate hay cuts, grazing and regenerative agricultural practices. Numerous articles demonstrate the benefits of these approaches and the great work that farmers are doing to conserve and enhance not only biodiversity, but also ecosystem services, from carbon sequestration to water quality and flood regulation (Chapman *et al*. 2018, Tamburini *et al*. 2020). But are we missing a piece of the puzzle?

Several conservation organisations are now using primitive breed ponies (such as Dutch Konik horses, but also our native Exmoor, Dartmoor, New Forest and Highland ponies) to manage habitats such as wetlands and moorlands (Figure 1), as they are well adapted to our weather conditions, the varied terrain and low nutrient forage. They provide a low-cost, low-resource approach to managing tricky habitats where cattle and sheep may not be appropriate (Box 1). But we seem to forget this ability when it comes to managing our domestic horses.

There are approximately 850,000 registered horses in the UK (BETA 2019), not including an estimated additional 7000 native feral ponies (Fraser 2020). Whereas there are no data on how much land is grazed by horses, following British Horse Society recommendations for 0.4–0.6 ha/horse (British Horse Society 2023), we can assume in the region of 425,000–510,000 ha of grassland (9.4–11.3% of all UK grassland) is utilised for grazing horses. If we could enhance this entire area, we could increase our species-rich grassland tenfold!

But, in my experience, when talking to ecologists, farmers or even the public, there is an assumption that horses must be grazed on short grass, that they create muddy fields, fence walk and generally destroy the land. That is, they create 'horse-sick' paddocks through the generation of 'roughs' (unpalatable areas of grassland which are never grazed) and 'lawns' (overgrazed areas of palatable species). Given the great work done through horses on nature reserves and surrounding areas (see Box 1, and Figures 1 and 2) surely this doesn't have to be the case? I believe that we can tackle big issues of depleted grassland and equine welfare in one hit, and here I provide an overview of how this could be achieved.

Box 1. Carneddau ponies

Carneddau ponies (Figure 2), a semi-feral population of 300 ponies with a range of approximately 5300 ha across Eryri National Park (Snowdonia), play a vital role in maintaining mountain landscapes. They graze differently than other livestock, with a wider, more diverse diet than domesticated ponies, eating soft rush (*Juncus effsus*), *Molinia*, gorse (*Ulex* spp.) and mountain grasses. Their grazing and trampling help to keep bracken (*Pteridium aquilinum*) and gorse under control and create pathways. Managed by the Carneddau Pony Society (a group of local farmers), under agreements with Natural Resources Wales, they are essential in maintaining the landscape of the mountains and benefit wildlife, from chough (*Pyrrhocorax pyrrhocorax*) to dung beetles. To prevent overgrazing, ponies are rehomed by local organisations to farmers and landowners, with advice provided to promote wildlife-friendly grazing. This practice brings community and economic benefits as the ponies attract tourists, require minimal housing and enhance natural resources through selective grazing.

Figure 2. Carneddau pony, early spring in the Carneddau mountains. Photo credit: Carl/stock.adobe.com. Image used under licence.

The problem

Since the onset of agricultural intensification and forage (hay/haylage/silage) production, many fields are dominated by cultivated species, chosen to maximise production of cattle. These include rye grasses (*Lolium* spp.), Timothy (*Phleum pratense*), cocks foot (*Dactylis glomerata*) and fescue species (*Festuca* spp.) (Peeters 2004). These are 'cool season' grasses, which grow all year round and are resilient to seasonal variation, thus providing high yields and capable of withstanding high grazing pressure. This often results in grass that is high in water-soluble carbohydrates, or sugars, and highly digestible. They are promoted as a mechanism to support the effective use of protein, thus supporting high livestock growth rates and production. This is perfect when producing high quantities of meat or dairy in a short time (Parsons *et al*. 2011), but this approach of monoculture high-sugar grass systems does not meet the nutritional needs of animals. Although ruminants manage 'ok' on these monocultures, due to their ability to process high levels of sugar without too many issues, for horses, naturally adapted to a high-fibre, low-sugar diet and to forage across rangelands scarce of food (Ermers *et al*. 2023, St-Louis and Côté 2012), being provided with an all-you-can-eat-buffet of sugar-rich grass causes all sorts of issues. It can result in overeating and the development of metabolic issues and obesity, alongside malnutrition.

But what happens when we allow grazing on a diverse sward? There is little research into this, but we do know that species-rich grasslands have lower energy and protein levels than agriculturally improved grasslands, whereas herbal components provide higher quantities of minerals (Shelswell 2017). It is therefore expected that the use of species-rich grassland in agricultural systems will reduce the necessity of supplementary feeds needed to maintain healthy livestock. Some initial studies undertaken by Defra in the Diverse Forages Project (Institute for Food Nutrition & Health 2024) demonstrate how grazing a diverse sward can improve the nutritional balance of a cows' diet, consequently improving the health of the animal, reducing vet bills, antibiotic and steroid use, and feed bills, and thus also improving the nutritional quality of the meat (compared to meat reared intensively on monoculture grassland). We could expect the same from our horses; after all, this is what they were naturally selected to do!

Unfortunately, this isn't what is implemented by most equine land managers. Instead, horses, particularly those with metabolic disorders, are traditionally managed through restricting forage intake, through stabling or use of grazing muzzles or starvation paddocks (paddocks with little to no vegetative matter). These approaches often compromise other aspects of horse welfare (Cameron *et al*. 2021), primarily as they restrict access to the three Fs (Box 2).

Box 2. The three Fs

The foundation of horse welfare can be summarised in the three Fs:

1. freedom – to move and to make their own choices (e.g. when to find shelter)
2. forage – fed *ad lib*, or at least never running out
3. friends – companionship and a stable herd.

These are the primary requirements to keep happy, healthy horses, and the considerations which should be made during conversations with equestrian landowners to best help them look after horses in their care (Furtado *et al*. 2022).

A solution?

Managing horses to have access to the three Fs (Box 2) at a stocking density appropriate for grassland management can be challenging on traditional grazing set-ups. Unless you are lucky enough to have free access to hundreds of hectares to allow your horses to graze, such as how ponies are managed across the Carneddau mountain range (Box 1), sufficient land usually isn't available to allow horses to demonstrate natural herd behaviours (i.e. covering 30–80 km or more a day searching for food). Rather, the restricted land available means horses will forage selectively, creating the horse-sick pastures mentioned above. Equine land managers usually tackle this problem by restricting grazing time, cutting and spraying (herbicide) roughs, and widespread application of fertiliser to encourage more grass growth (supporting growth of quick-growing agricultural species and 'weeds'). This creates a vicious cycle of too much/too little grass and ever higher levels of inputs to maintain the system.

Alternative approaches have been hugely successful in rehabilitating horses with critical illnesses, including metabolic disorders, and could support both pasture management and environmental goals including increased biodiversity, water regulation and carbon sequestration. While we can learn from regenerative agriculture approaches that favour rotational or mob grazing systems, there are two equine-specific systems worth highlighting, designed to target equine-specific needs where available land is restricted:

1. the track system, or Paddock Paradise
2. the EquiCentral system (see Box 3).

The success or failure of these systems lie largely in understanding the behaviour of horses, and the land (topology, drainage, prevailing wind).

From an ecological perspective

Unfortunately there are few studies that investigate the enhancement of biodiversity and ecosystem services from implementation of the above approaches. However, we could expect to see similar enhancements to those we get from regenerative agricultural processes, despite the loss of 'sacrificial' areas. Due to the lack of published literature Switch Equine have

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Box 3. Two equine-specific systems

Paddock Paradise

The Paddock Paradise system (Jackson 2018), more commonly referred to in the UK as a track system, is in its simplest form a fenced track around the perimeter of a field (Figure 3), often fully or partly surfaced. Tracks can maximise the space available and are often favoured when space is restricted, stocking densities cannot be reduced or horses need their grass intake restricting. The central part of the track may be left for hay cuts, or as standing hay, providing opportunities for the creation of good-quality, species-rich diverse grasslands, at the sacrifice of the track area itself. It is the most popular alternative management system for horses in the UK due to its cheap and easy set-up (Furtado *et al*. 2022), with several livery yards now adopting this approach across the UK.

Figure 3. Horses enjoying herd life on a track system. Photo credit: Femke/stock.adobe.com. Image used under licence.

EquiCentral System

The EquiCentral System (EquiCulture.net 2022) encourages the use of rotational grazing approaches, combined with surfaced holding yards (Figure 4). The approach is based on ecosystem function and aims to improve overall biodiversity of grassland and soil health through a reduction in grazing pressure, with the holding yard allowing fields to be rested as required. It has been successfully implemented in livery yards, which continue with individual turnout by operating multiple mini 'EquiCentral' systems in each field.

Figure 4. Two depictions of an EquiCentral System set-up. Image from EquiCulture.net.

Table 1. Overview of quantitative analysis undertaken so far (full records of all monitoring available on request).

	Biodiversity units (area)	**Soil analysis**				**Forage analysis (%)**				
		pH	Soil organic carbon %	Organic matter %	C:N ratio	Calcium	Phosphorus	Magnesium	Chloride	Potassium
Ideal	16.18 (target)	6.0–7.0	3+	3–6	24	0.32	0.18	0.10	0.56	0.43
Baseline	6.00	6.8	3.4	5.9	13	0.45	0.27	0.14	0.70	1.03

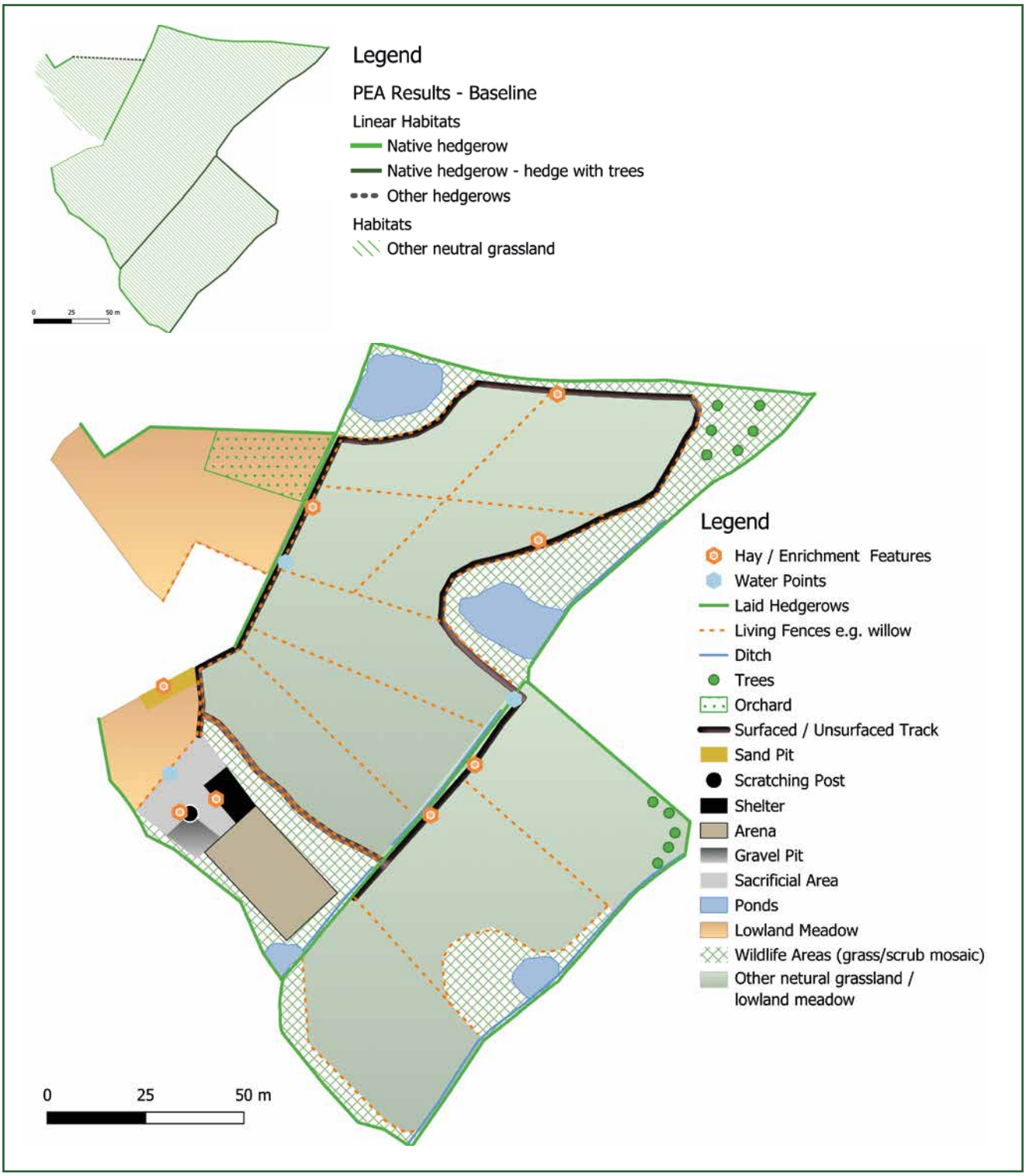

Figure 5. Baseline habitats and indication of future grazing system.

taken it upon ourselves to monitor the issues, identify risks and see the opportunities and benefits from such systems by buying a smallholding (with 2 ha of grazing) in 2022, historically grazed by horses.

We first undertook baseline surveys (Table 1), including UK Habitat Classification (Figure 5) and Defra biodiversity condition assessments, species surveys (including small mammals, birds and invertebrates (with a focus on earthworms and dung beetles)), soil analysis (Albrecht/Kinsey System and Soil Carbon Audit) and forage analysis (near-infrared nutritional analysis) and observational recordings (such as water infiltration rates).

Soil analysis demonstrated reasonable levels of soil organic carbon and organic matter as well as calcium, but low levels of all other minerals. Interestingly, forage analysis showed the grass to be low in calcium, potassium and trace minerals, but high in phosphorus, magnesium and chloride (compared to ideal nutritional compositions for horses). This means that, for horses to be healthy, supplementation will be required.

We also took baselines of our horses' health through weight measurements, movement recordings (using a pedometer) and worm burdens, as well as general observations. We propose to continue monitoring environmental (and horse) health over the next few years to develop a record of benefits and disbenefits to the application of grazing approaches. We would also like to monitor fungal communities and welcome suggestions from readers of other analysis/surveys to consider.

We believe that good-quality soil is the foundation of all ecosystems, and the differences in soil and forage analysis have demonstrated that the interactions are not straightforward. We will therefore be trialling and monitoring different interventions (on different fields) to improve soil quality, such as variations in grazing intensity/duration, overseeding and applications of organic matter. We will do this alongside trialling variations of living fencing ('fedges') as alternatives to electric fencing.

Our aim is to enhance diversity of fields towards lowland meadow classification, and while it may be too early to say we're there, we have seen an increase in flora diversity from 4–5 to an average of 9–10 species per square metre in just 2 years. So we definitely think it is achievable!

So far, we have enhanced diversity through:

- reducing the stocking density from 0.96 livestock units to 0.32 livestock units
- 'sacrificing' 8% of land to dirt tracks and surfaced yards
- applying seed mixes and green hay, targeting species with differing root lengths to improve soil composition (reduce compaction)
- applying organic matter, exploring different composting techniques and application rates
- resting the fields.

This has seen the sward change from being perennial rye grass (*Lolium perenne*)- and clover (*Trifolium* spp.)-dominant, to the establishment of species including crested dog's-tail (*Cynosurus cristatus*), common spotted orchid (*Dactylorhiza fuschii*), yellow rattle (*Rhinanthus minor*) and common knapweed (*Centaurea nigra*). As we progress, we will seek to select species that will supplement the nutritional deficiencies found in the soil, working with experienced regenerative farmers and equine nutritionists.

Fauna have also increased, with several new species observed, including grass snakes (*Natrix natrix*), toads (*Bufo bufo*), hares (*Lepus europaeus*) and barn owls (*Tyto alba*), alongside increases in small mammal and dung beetle populations.

There is a lot yet to be done, but we see no reason why these approaches could not be scaled up (and indeed they are being) to large racing, livery or polo yards, or even implemented alongside regenerative farms, as well as on small holdings such as ours.

Conclusion

Although the jury may still be out on the environmental benefits and disbenefits of alternative grazing approaches for horses (and perhaps restoring all horse grazing to unimproved grassland is currently unrealistic), it is clear we can at least make some improvements, and for me every step in the right direction is worth pursuing. We may even be able to support this change through Biodiversity Net Gain, agri-environment and/or ecosystem service payments. So next time you have a horsey client, please think outside the box and see if you can make some positive changes for everyone's benefit – the horses included.

About the Author

Laura Hobbs MRes, CEnv, MCIEEM is an ecologist with degrees in evolutionary and behavioural biology, with a focus on ecosystem interactions. Over the years she has developed her expertise in regenerative agriculture, creating management systems that work for the landowner and the environment. Supported by extensive CPD in equine welfare, Laura is an advocate for species-appropriate management and hopes to demonstrate how we can support environmental recovery through better management of our horses. She founded Switch Equine to promote these approaches.

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