

A GUIDE TO GRAZING AND BROWSING FOR REWILDERS

**REWILDING
BRITAIN**

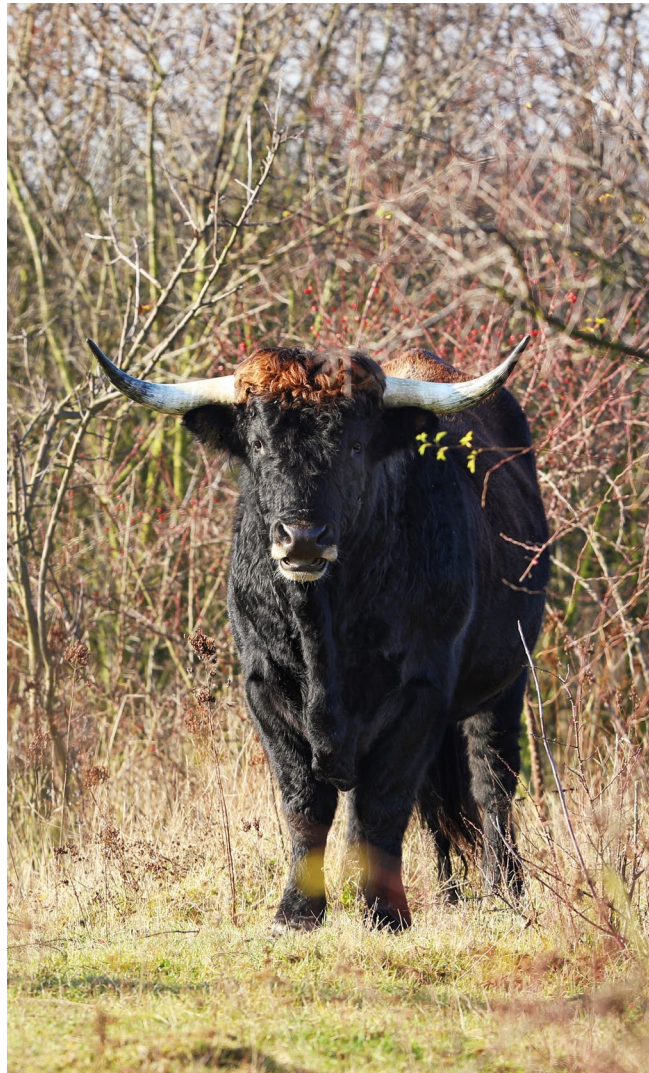


INTRODUCTION

THIS IS ONE IN A SERIES OF REWILDING NETWORK GUIDES PROVIDING PRACTICAL INFORMATION TO INFORM YOUR REWILDING STRATEGY

Whether you've already taken steps on your rewilding journey or you're exploring how to rewild your land, this Guide to Grazing and Browsing for Rewilders is for you.

We hope the guide provides practical ideas, information and inspiration to help you start your own rewilding project. It's worth noting that rewilding approaches need to work for your land specifically – each project is unique and it's important to adapt the advice and information in the guide to work for you and your land.



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1. THE ROLE OF GRAZERS AND BROWSERS

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In this section we look at why and how grazers and browsers play such an important role in rewilding projects.

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WILD HERBIVORES HAVE BEEN DRIVING AND SHAPING THE EVOLUTION AND DIVERSITY OF SPECIES, HABITATS AND ECOSYSTEMS IN BRITAIN FOR MILLENNIA

Wild mammals are not only a rightful part of our living landscapes, they also dramatically influence its character, driving and shaping the evolution and diversity of species, habitats and ecosystems. They were doing this for thousands of years before grazing animals were domesticated. Natural succession describes the predictable process by which plant communities evolve over time as the environmental conditions in an area change. One of the main ecological disturbance processes acting in opposition to natural succession is herbivory – the consumption of plant material by herbivores.

Although many of our wild herbivores disappeared long ago, their legacy is everywhere. In fact, the wildlife in Britain and the rest of Europe is well adapted to living among large herbivores. The loss of these animals is as detrimental to flourishing biodiversity as heavy or uniform grazing.

Understanding some of the varied ways in which herbivores shape landscapes is an important part of rewilding, and knowledge of the vital ecological roles of grazing and browsing animals should help shape your rewilding strategy.

NATURAL HERITAGE

The character of today's terrestrial habitats is inextricably linked to the post-glacial warming of Britain around 12,000 years ago. The island of Britain was then home to a great variety of large mammals and diverse plant communities that recolonised from mainland Europe as the ice retreated, before early humans began to clear trees for farming.

For millennia, Britain's flora evolved in tandem with saiga antelope, brown bear, reindeer, European bison (wisent), musk-ox, Eurasian elk, Irish elk, European water buffalo, wild horses, woolly rhino and aurochs. The latter five ancient species are now globally extinct. We then lost two more dramatic ecosystem engineers: beaver and wild boar. Both have been reintroduced recently, but exist in Britain in vastly diminished numbers.

These natural grazing animals and their influence were kept in balance by many predators, such as lynx, Arctic fox, wildcat and wolf, until they too became extinct – some through climate change but most due to habitat loss or because they were killed by human hunters.

We have replaced this rich array of native wild grazers, browsers and their predators with domestic proxies including cattle, pigs, horses and some feral species similar to extinct counterparts such as Exmoor ponies. These breeds now play a pivotal role in creating some of Britain's most treasured natural spaces.

We can learn from the past, but rewilding is not about recreating lost landscapes. Rather, it's about restoring the natural processes that are key to boosting biodiversity and supporting life on this planet. Herbivores, in all their varied shapes and sizes, have a crucial role to play in sculpting, restoring, maintaining and creating wildlife richness. Of course we're missing the crucial contribution of our top predators, but by ensuring that a full suite of native herbivores is present much can still be done to create dynamic natural systems.

HERBIVORE DIVERSITY IS KEY

This guide focuses on large herbivores, because they tend to have the greatest impact. We've also included wild boar (or their equivalent hardy-breed pigs), although they're technically omnivores.

Each herbivore is different and each has evolved characteristics and behaviours that enable it to handle different vegetation to satisfy its diet. These differences mean that each shapes its surroundings in distinct ways.

Some herbivores eat grass and other herbaceous plants and are known as grazers. Others eat parts of woody vegetation, soft shoots and tree leaves and are known as browsers. Others, still, are adapted to eat plant roots, fruits, nuts, seeds, pollen, nectar or a mixture of these. The consumption of different plant parts allows many different types of herbivore to live in the same place without directly competing with another species for food. Reintroducing this diversity is essential to restoring all the missing ecological functions to our landscapes.

DIFFERENT HERBIVORES SHAPE THE LANDSCAPE IN DIFFERENT WAYS

KEY FEATURES OF A HERBIVORE

Big herbivorous mammals have evolved to eat plants: they have specialised mouth shapes, tooth structures and digestive systems. We must, therefore, restore small numbers of several native herbivore species to rewilding landscapes to replace what has been lost. The type of herbivore matters, as does the numbers reintroduced and the natural herd behaviours they exhibit.

Herbivores can also influence the climate of habitats, particularly through their effects on carbon sequestration and storage. Wild animals alter carbon exchange between ecosystems and the atmosphere through:

- the consumption of plant material, which affects both plant biomass and species assemblages;
- the redistribution of seeds and nutrients over vast areas of land and sea;
- the trampling and compacting of soils and sediments.

Through these and other activities, animals can increase or reduce carbon sequestration on land and in the sea.

All this biology provides an important context for the role of herbivores in rewilding. It helps to explain why using a range of animals provides the diversity and complexity that characterises wild nature. The more varied your rewilding project the more potential it has for variety.

Sadly, we've lost most of our wild herbivores, but older, hardy breeds of cattle, horses and pigs can approximate the behaviour of their wilder ancestors. Just keep in mind the fact that the aim of rewilding is to enable your grazers and browsers to behave as wildly and naturally as possible.

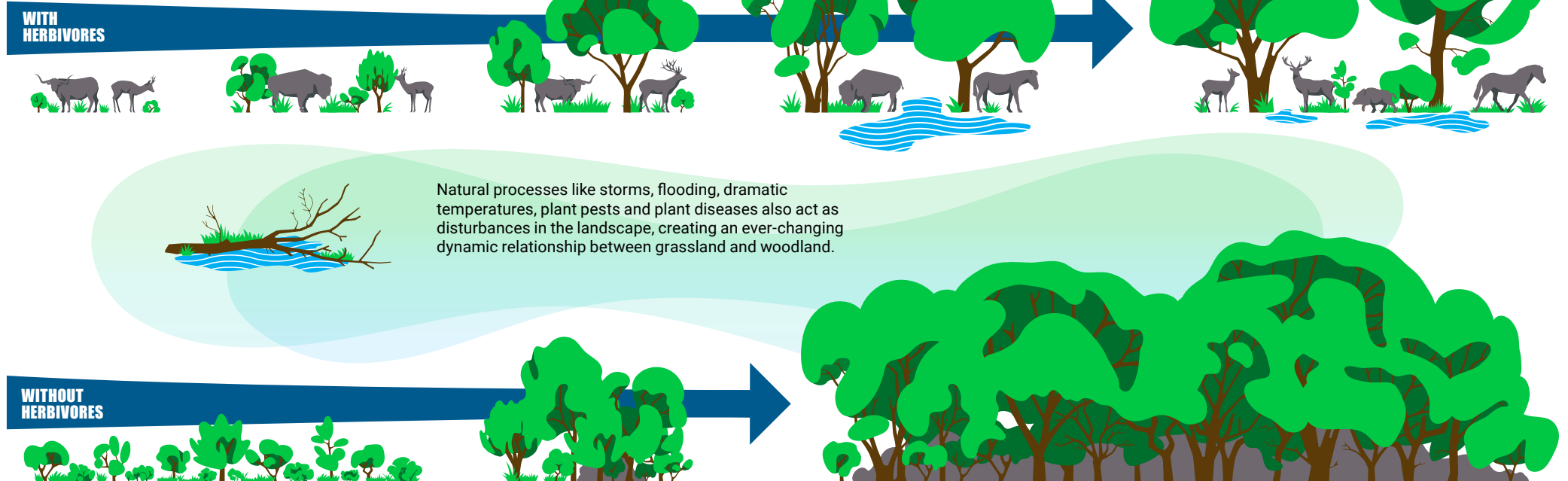
THE ROLE OF HERBIVORES IN NATURAL SUCCESSION

Herbivores play a key role in shaping habitats over time. Their presence creates ecological disturbances that interrupt the evolution of grassland into closed canopy forest. What evolves is wood pasture, a form of open grassland mixed with areas of trees and scrub. Wood pasture is a rich mosaic of habitats that supports a diverse variety of species in British lowlands.

Wild horses, bovine species such as bison and cattle, wild boar, red deer, roe deer and elk create disturbances in the landscape through activities including grazing, browsing, rootling, scraping, digging and movement.

As different herbivores selectively forage on preferred plants, open patches appear among denser areas of new growth. Small bodies of water may also appear where animals have wallowed, dug or bathed.

Wood pasture forms – a diverse mosaic of open grassland with areas of trees and scrub. This system is ever-changing over time, with open areas moving around as animals roam and plants grow.



Without large herbivores in the landscape, vegetation isn't consumed or significantly altered. Soil isn't disturbed, and nutrients aren't cycled as effectively through the ecosystem. Seed dispersal is reduced, and a more uniform community of plants starts to emerge.

Closed canopy woodland forms. Higher and more uniform levels of shade mean that only shade-tolerant ground flora can thrive. The species which depend on dappled shade and more open areas decline.

ACTIONS OF GRAZERS AND BROWSERS

Grazers and browsers influence ecosystems in a number of ways, and their actions and impacts vary by species. This table indicates the actions of different species and demonstrates why we must look to restore a full suite of suitable herbivores in order to restore all ecological function.



	BEAVER	BISON	CATTLE	ELK	RED DEER	ROE DEER	WILD BOAR	HORSE
Bark stripping	Browser	Grazer	Grazer	Browser	Browser	Browser		Grazer
Branch breaking			Grazer	Browser				
Damming	Browser							
Fraying			Grazer	Browser	Browser	Browser	Browser	
Lawn grazing			Grazer					Grazer
Rootling							Browser	Grazer
Scenting				Browser	Browser		Browser	Grazer
Scraping		Grazer			Browser	Browser		Grazer
Seed dispersal		Grazer	Grazer	Browser	Browser	Browser	Browser	Grazer
Trampling		Grazer	Grazer		Browser			Grazer
Tree cutting	Browser							
Wallowing		Grazer		Browser	Browser		Browser	Grazer

 Grazer
 Browser

GRAZING FOR REWILDING: 10 THINGS TO KEEP IN MIND

SUMMING UP THE INS AND OUTS OF GRAZING AND BROWSING IN 10 KEY POINTS

1 Natural grazing isn't conservation grazing

Grazing for rewilding is not the same as conservation grazing. Conservation grazing seeks to maintain or improve a specific habitat and has a defined goal. A specific grazer is often used to achieve the goal, and numbers of grazers are controlled to help bring about the intended outcome. In contrast, wild or natural grazing is about restoring absent natural processes in all their fluctuating complexity. There is no predetermined goal or condition to reach, and numbers of animals are determined by the ecosystem rather than the desired outcome. The restoration of functioning ecosystems allows an undefined mosaic of habitats to develop, constantly change and evolve.

2 Herbivore diversity is key

Rewilding projects shouldn't aim to reintroduce just one or two herbivorous species. Different herbivores behave differently and shape the landscape in different ways. Rewilding seeks to restore natural processes and missing species, which means, in time, reintroducing all the large herbivores that would naturally be present in the local landscape.

3 Mimic fluctuations in natural populations

Mimicking the natural population sizes and behaviours of herbivores is important. Having too many animals stationary for too long will repress regeneration and turn all your land into grassland or heathland. If there are too few animals the land will revert to closed canopy woodland. Changing the number of animals each year will help mimic the natural fluctuations in population that occur in nature.

4 Don't forget about missing predators

Britain is missing its key predators, including lynx and wolf. The presence of semi-wild herbivores doesn't mean that our ecosystems are fully functioning, but they do play an important role (see page 8 for more about the role of predators). In most wild systems in Britain we will still have to play the role of the predator – i.e. killing and creating an ecology of fear to move animals through the landscape.

5 Every location is unique

The rate and scale of landscape change prompted by herbivores will vary according to location, soils, existing habitat and wildlife, and many other factors. What works in one location may not be suitable at another.

6 Nutrient cycling is a vital ecosystem process

Grazing animals help to move nutrients across the landscape, often over enormous distances, through their dung and the decomposition of their carcasses when they die. They are also important seed dispersers, scattering seeds via their gut, hooves and hair.

7 Britain has eight large native herbivore species

Britain's native wild herbivores include the aurochs (now extinct), red deer, roe deer, wild boar (technically an omnivore), elk (still present in parts of Europe), forest bison (close cousin of European bison), wild horse and beaver.

8 Hardy breeds can act as proxies for some species

Hardy breeds of cattle, pigs and ponies make the best proxies for wild herbivores in Britain when wild herbivore reintroduction is not possible. Their characteristics are close to those of their wild ancestors. Modern breeds do not have the same characteristics and are poor proxies for our missing wild animals.

9 Smaller rewilding areas require human intervention

The smaller the rewilding area, the more management is required (see page 11 to explore how many grazers you should have). It's not possible for humans to mimic all the ecosystem processes influenced by animals, but you may need to mimic herbivores as best you can if you don't have the space and are unable to work with your neighbours to support grazing at a suitable scale.

10 Sometimes grazing activities need to be reduced

In some cases your strategy will be about bringing grazing numbers down (i.e. reducing numbers of deer), before building up a more diverse mix of species once vegetation has recovered.

A WORD ABOUT PREDATORS

NATIVE LARGE PREDATORS ARE MISSING IN BRITAIN. REMEMBER THEIR ABSENCE WHEN DEVELOPING GRAZING STRATEGIES

For many thousands of years carnivores were a key part of Britain's island ecosystem. Among these carnivores were the Arctic fox (which gradually disappeared 10,000 years ago), wolverine (8000 years ago), lynx (exterminated in Britain around 1300 years ago) and wolf (hunted to national extinction around 250 years ago). The wildcat went extinct in England 170 years ago and has recently become functionally extinct in the wild in Scotland, although captive breeding efforts continue. The omnivorous brown bear was also native to Britain (and is still present across Europe), but went extinct around 400CE.

Predators influence herbivore activity in various ways: they directly predate on animals, alter breeding patterns and keep herds on the move through a landscape. The extinction of these predators in Britain, primarily at the hands of human hunters, has reduced the complexity of ecosystem processes and in many cases resulted in less ecologically rich landscapes. An example of the consequences of this can be seen in Scotland, where red deer exist in unsustainably high numbers as a result of human activity and the lack of predators. Their numbers and grazing behaviours are no longer constrained by predators, and as a result they are suppressing the regeneration of native woodland across millions of hectares.

In addition to the vital role that predators play in a fully functioning ecosystem, the lynx and wolf are keystone species and have a disproportionate impact on their environment relative to their abundance. Like other keystone species such as beavers, they play a critical role in shaping our landscapes and enabling natural processes, primarily through predator-prey dynamics.



Predators influence herbivore numbers and behaviour, altering the shape of the landscape

TROPHIC DIVERSITY RESULTS IN HEALTHY, RESILIENT ECOSYSTEMS

The vigilance of herbivores in a landscape in which predators are active helps to create a mosaic of habitats. The variation of ungrazed and lightly grazed areas results in the gradual development of shrubland, woodland and open grassland. In contrast, in a landscape in which no predator is present and grazers can comfortably graze open grasslands and remain in one place, hot spots of palatable habitat (usually grassland meadows) emerge where lots of grazing occurs, suppressing the growth of vegetation.

Predators also shape ecosystems by consuming other animals. Predation of herbivores reduces herbivore numbers, which can impact those animals' breeding success and breeding behaviours, and result in a carcass. Carcasses are an ecologically important consequence of predator-prey dynamics. Birth, life, death and decay are a key part of ecosystem function and allow nutrients and elements to cycle

THE ECOLOGY OF FEAR

When predators are present herbivores are alert to the risk of ambush. A nervous herbivore is a less efficient and thorough feeder. These prey animals are less likely to linger and will keep moving through the landscape to lessen the risk of predation. This behaviour gives saplings the chance to establish more widely.

This is one of the reasons why the reintroduction of wolves to Yellowstone National Park in the US had such a positive ecological impact. Within 20 years of wolf reintroduction, willow growth rebounded, river banks stabilised and wildlife returned, including beavers, foxes, songbirds and eagles. This was due to the presence of wolves and the impact they had on elk and deer populations.

naturally through earth systems. Like deadwood, a carcass feeds and enriches the soil as it breaks down. It provides important food and nutrients for scavenging animals, including birds, smaller carnivores such as foxes, and a whole array of insects such as beetles.

However, carcasses are sorely missed in Britain. Regulations forbid leaving the carcasses of domesticated animals on the ground (even if they're semi-wild). With some qualifications, wild deer carcasses can be left as forage for wildlife, although this is rarely done.



Carcasses support the ecosystem by providing food, shelter, and nutrients for species

PREDATION

PLAYS A VITAL ROLE IN HEALTHY ECOSYSTEM FUNCTION

MIMICKING PREDATORS

Our lack of predators creates an unbalanced ecosystem. Try to keep this in mind when you're rewilding, and put measures in place to mimic the activities of predators. Humans cannot mimic all aspects of the complex predator-prey dynamic, but in the absence of wild predators what we can do is better than nothing.

The presence of people can help to mimic (albeit rather poorly) an ecology of fear. Footpaths and visitor footfall can disturb grazing animals and encourage them to graze in other areas. Targeting specific areas (e.g. young, regenerating woodland) for deer shooting can keep deer wary and on the move. GPS collars such as Nofence can also be used to mimic predator presence by moving herbivores through the landscape.

Mimicking predation is a little easier. You can harvest animals to keep numbers low, which can create saleable meat as a by-product. In Scotland, the culling of red deer is necessary for most landowners attempting to regenerate woodlands and other habitats. Deer numbers are a problem across much of England. There is also a species imbalance, with several non-native deer species and an absence of red deer across most of the country. Harvesting herbivores for meat can support nature-based economies alongside ecological restoration, though it should not be the primary purpose of culling. For example, at the Knepp Estate in East Sussex the populations of Tamworth pigs, red and fallow deer, and longhorn cattle are managed and the by-product is sold as high-quality meat. At Purbeck Heaths National Nature Reserve in Dorset, mangalitzas are on site to mimic the activities of wild boar in agreement with a local butcher, who has exclusive rights to the meat that results. It is not essential for a rewilding project to manage herbivores itself, and many projects partner with businesses or individuals in mutually beneficial arrangements.



Wild meats can be a valuable source of income for rewilding projects and help balance animal numbers

If mimicking predation, vary harvest numbers to replicate the population fluctuations that would occur naturally. In the wild, predators take more animals when they've had a good breeding year. In other years they may take fewer. Don't be predictable in your actions: be as random as possible and think like a predator. Predators will often target weak or injured animals: this could also inform your decisions, as should welfare requirements.

Harvesting also allows you to decide which animals are best suited to your project, and which you may want to remove from breeding. Bad mothers or weak animals are more vulnerable to predation in the wild, and, depending on the species, males are occasionally isolated or evicted from herds because of their behaviour. You may also need to cull for temperament where animals graze near public footpaths; this isn't mimicking predators but can be useful in reducing conflict!

2. GETTING STARTED

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This section focuses on the key things you need to consider before introducing herbivores, such as costs and the animal numbers that your land can support.

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Fencing

Looking after animals

Being wild and free

Number management

Monitoring impact



HERBIVORES ARE CENTRAL TO MANY NATURAL PROCESSES. HOWEVER, INTRODUCING THE FULL SUITE OF HERBIVORES ONTO YOUR LAND MAY NOT BE APPROPRIATE STRAIGHTAWAY (OR AT ALL)

Rewilding is a long-term project. Many natural processes act on timescales of decades or even centuries and across hundreds or thousands of hectares, and as rewilders we must adjust our expectations and activities to reflect nature's timescales. Rewilding in Britain is also not simply about abandoning land and leaving it to sort itself out. Some ecological processes in Britain are either not functioning or are heavily degraded, and rewilding means restoring these processes so that nature can recover. This can mean careful costing and planning. The introduction of grazing and browsing animals on a larger scale requires animal transportation and management, and sometimes licences. All of this may seem overwhelming, but several factors discussed below will help shape your rewilding plan.

GET EXPERT HELP AND ADVICE

As part of your ecological surveys you are likely to have some idea of the mammals that are already active within your project area. Ecologists can give you further advice on how your site is developing and whether it is missing ecological processes, and should be able to refer you to specialists for additional advice. You need to find someone with expertise and knowledge who can provide advice on when to start introducing herbivores, the types and numbers, and any management measures necessary. When it comes to grazing, you'll need someone who understands the behaviours of herbivores and their role in ecosystems. Organisations can provide this advice, or you could work with neighbouring graziers with knowledge of the area. The [Rare Breeds Survival Trust](#) is another good place to start.

You will also need ongoing expertise to manage the animals and comply with livestock and welfare regulations. Finding someone with the right experience for this is important: managing rewilding animals is not the same as managing animals for agricultural purposes.

HOW MANY GRAZING ANIMALS SHOULD A REWILDING PROJECT HAVE?

THERE IS NO MAGIC NUMBER FOR THE 'CORRECT' NUMBER OF ANIMALS, AND THERE ARE A NUMBER OF VARIABLES

Rewilding Britain is commonly asked about the number of grazing animals that a rewilding project should consider. It's a complex topic because: 1. It depends, 2. There's no right answer, and 3. Every location is different.

The third answer is the most important. Every project in the country has different pressures and a different approach to how they're transitioning to rewilding. It's impossible to give a one-size-fits-all answer to this question.

Rewilding is also an exercise in constant learning. In Britain, we've lost so much knowledge of natural processes that we're constantly relearning what our ancient ancestors would have known, particularly around the behaviours and impacts of wild and semi-wild native herbivores.

In the wild, predation (including by humans) and availability of food determine the population densities of herbivores. These numbers are ever-changing because the living world is a dynamic, unpredictable place. One year a tree might disperse loads of nuts that feed wild boar and boost their numbers, but in another year a same tree may produce little seed and reduce the boar population. Flood, drought, heat, cold, disease and many other factors influence population dynamics.

SIZE MATTERS

The types and numbers of herbivores you can have in your rewilding project will depend on the size of the rewilding area, existing habitat, quality and accessibility of forage, quality and accessibility of water, specific management goals (which should be quite loose in a rewilding context) and more.

Numbers should be kept as low as possible to boost regeneration of vegetation and restore natural processes. That might mean having little or no grazing for 5–10 years, especially on over-grazed, degraded landscapes where

vegetation needs to establish. You want to introduce animals with caution, and observe their impacts closely. To express their natural behaviours, herbivores need freedom to roam through mixed habitats across large areas.

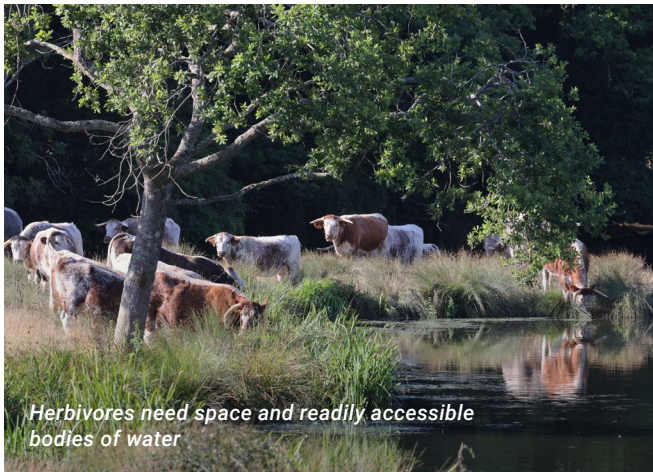
ANSWER 1: NONE – FOR A WHILE, AT LEAST

If you've just bought land or you've been managing it in a particular way, leave it be while you undertake baseline ecological surveys and determine what actions are needed. This is true whether it's arable land, woodland, a thicket of thorns/brambles or a collection of fields. Don't dive in head first with a compendium of deer/cattle/pigs/horses/bison before you understand what's happening on site and what impact any changes you've implemented are already having. You shouldn't feel that you have to have grazing animals.

At Rewilding Britain, we've had queries from landowners with 40 hectares asking what mix of pigs, cattle and ponies they should have. Forty hectares is at the small end of rewilding and not a big enough area to carry mixed herds of grazing animals. At this size you might choose to mimic animal behaviour, or rent or borrow the grazers you need (see points 2 and 3 below).

WHAT SIZE IS YOUR PROJECT?

The Knepp Estate has observed that one Tamworth pig might rootle around 16 hectares (40 acres) a year when it's wet, and that it takes around four months for that land to recover to a grazeable level. This project is situated in a lowland area in the southeast of England, where plant productivity is higher than many other parts of Britain. For sites on more difficult terrain and/or further north, where lower-quality forage is available, more space is needed. Pigs are social animals and you shouldn't introduce just one to your site – at least two should be planned, ideally more. This means a minimum of 32 hectares (80 acres) is needed for a site situated in a lowland, low latitude part of Britain. Sites on more difficult terrain and/or further north will need more space for the same number of animals.



Herbivores need space and readily accessible bodies of water

If you have a larger project, it may still be a good idea to do nothing for a while. This gives you the chance to see what's what and allows existing vegetation to recover from the previous land use. In the Southern Block at the Knepp Estate, the first fields came out of agriculture in 2000 and grazers were introduced in 2009. This meant that some fields were fallow for nine years. This appears to have supported the initial vegetation pulse, helping to boost biodiversity and create the wood pasture landscape that we see today (see page 29 for more on the Knepp Estate's grazing strategy).

If you're considering introducing animals earlier than this very low densities may be the best option to allow natural regeneration. Pigs in particular can help to kick-start natural regeneration and break up the sward. Alternatively, you could consider more management to move your animals through the landscape in the early years of the project, for example by using mob grazing and resting approaches until vegetation has been given time to recover.

The trick is to be light touch but not too light touch. If you don't have any grazing animals, scrub and woodland can easily start to dominate. You have to keep an eye on what's happening and make decisions accordingly. And don't forget, you may already have grazers on your land such as deer, which play a key role in the landscape, and small herbivores such as rabbits and geese in high numbers. Some projects, especially those in Scotland, will be looking to reduce deer

numbers substantially to assist natural regeneration rather than introducing more grazing animals.

ANSWER 2: NONE – MIMIC ANIMAL BEHAVIOUR INSTEAD

One step up from having no grazers and doing nothing is taking manual action to help stimulate natural processes. If you don't want to manage animals, or you want to speed up recovery, you might choose to mimic the job of grazers. This can be appealing if you're rewilding large areas of land that have been intensively grazed and have little tree cover and seed source.

For example, pasture that was previously intensively grazed by sheep may have little plant diversity, little tree cover and poor hedgerows. In this scenario, scarifying the ground manually with a machine might help break up the sward, encouraging dormant seeds to germinate and creating disturbed areas for new seeds to spread naturally from hedgerows and any trees nearby. Pigs can do the same job, but you may not be ready to introduce them to your land.

The machinery you use to do this will vary according to scale. On smaller areas you can use a hoe to mimic the action of a boar. On a larger scale, you'll typically need a bigger bit of machinery to harrow the ground. This is usually a tractor dragging a large chain-harrowing tool.

Other ways to mimic animal actions and natural processes include:

- coppicing trees (like a beaver or deer);
- leaving deadwood;
- roughly chopping with an axe to mimic tearing with teeth;
- bringing grazers on to smaller areas of land on a temporary basis only, something we explore below.

This last action mimics the passing through of wild herds of herbivores as they might have done thousands of years ago.

Mimicking natural processes is an imaginative way to approach rewilding, and it isn't new. Until relatively recently, humans mimicked and manipulated natural processes to survive and thrive alongside nature.

RECONSIDERING STOCKING DENSITIES

Stocking rates for grazing animals are usually expressed as livestock units per hectare per year. The standard LU in the UK is one 650kg cow (other countries have their own standard units): an adult longhorn cow averaging 600kg would be 0.92LU and a red deer hind (81kg) would be 0.12LU. Thus, one 650kg cow (1LU) is equivalent to 8.02 red deer hinds (0.12LU each). Livestock Units per hectare (LU/ha) can be used to compare stocking densities and therefore the 'intensity' of grazing across different properties.

Many rewilders use agricultural language when discussing the inclusion of large herbivores in projects, because proxy animals are still classed as livestock in British law. Using this language makes management and reporting easier, and makes it possible to compare rewilding projects with farmed systems.

Many factors affect the density at which herbivores can coexist on a site. These include latitude, geography, existing and emerging habitats, soil type, topography, hydrology and even former land use, in addition to factors such as the type of breed being used if domestic animals are proxies for wild species (different breeds have different weights and foraging habits). It's not possible to offer one standard LU for rewilding projects because each location is different and in most cases projects should start with a very small, viable number of animals to see how the land responds, before adjusting as needed.

After 20 years the Knepp Estate's average LU/ha for the whole rewilding project is around 0.3LU/ha. This is an average of three cows per 10 hectares (the Estate doesn't just have cows, though, and all animals should be counted in an LU/ha calculation). The Estate is largely a lowland wood pasture system with high plant productivity in southeast England (see page 29 for more on the Knepp Estate's grazing strategy). Rewilding projects in more northern locations – those in uplands, and those with more challenging topography – will have a stocking density even lower than this.

There's no replacement for wildlife doing its thing in its own unique, unpredictable, ever-changing way, but in many places we have to do the best we can. Mimicking nature is part of that.

ANSWER 3: NONE – RENT ANIMALS AS NEEDED

The Sharpham Estate in Devon is rewilding a site of 20 hectares. The site is managed by Ambios, an organisation that trains people in practical conservation.

Introducing grazing to smaller landholdings is tricky. There isn't space to accommodate natural herds, and overgrazing can happen quickly. Previously, the site at Sharpham was heavily grazed and trampled by dairy cows, leaving a very compacted sward.

To find a solution Ambios visited the Knepp Estate to see what role pigs were playing. The animals were successfully breaking up tight ground but Ambios didn't want animals at Sharpham permanently.

Ambios then heard that it could rent pigs from nearby Rewilding Futures, a regenerative agriculture project in south Devon. Rewilding Futures supplied two curly coated mangalitza pigs for six weeks for a total cost of £1,500.

"Around rewilding, people are setting themselves up to hire out large herbivores. It's a new business opportunity," says Simon Roper, Director at Ambios. "Renting pigs was perfect for us. We don't want to bring on permanent animals. We want to experiment and learn, using different sorts of animals for different periods of time in different conditions."

Read more about Ambios at Sharpham on page 37.

ANSWER 4: NONE – BORROW OR SHARE

Many livestock owners are now looking for access to grazing land. If your neighbour has animals with a grazing need, you may be able to agree access to your land on an informal (or even a formal) basis. This isn't the same as leasing out fields for grazing continuously.

You'll have to agree on the number of animals, timing, place and duration of access, to ensure the grazing is working as part of your site's nature recovery. This needn't be complicated.

We know of one Yorkshire landowner who offered to take his cattle to his rewilding neighbour for grazing duty. He's flexible and happy to take whatever grazing is available when it's available. This occasional grazing mimics the natural migration of herbivores through the landscape and is something we've lost in Britain.

If you're a member of the Rewilding Network you can find rewilding projects near you and potentially work to pool your grazing requirements. As projects progress, there should be increased opportunities around the country to share animals and move them on and off different rewilding projects as needed.

ANSWER 5: AS FEW AS POSSIBLE

No matter how big your rewilding project is, it's best to think small when you start introducing herbivores. Rewilding projects aim to mimic natural herbivore populations, whose numbers are often much lower than the numbers used for conservation grazing and farming schemes. You'll need to account for a growing grazing population through breeding, so it's best to start with fewer animals at the beginning of your project.

Starting small also gives you the opportunity to see how the animals affect the environment. Your first grazers will show whether they're repressing natural regeneration, which vegetation they're favouring and where they might be grazing in one location for longer than is ideal. It will also give you the opportunity to ensure that your stock handler is able to manage the herd in accordance with current legislative practices.

The Knepp Estate had around 550 animals in the summer of 2005: 500 deer, 16 cattle with 13 calves, 6–10 ponies and 10 pigs (two sows with eight piglets were introduced in early 2005). These numbers have gradually increased over time as habitats have recovered – to around 1000 large herbivores today.

ANSWER 6: VAST ROAMING HERDS

As we move up the rewilding spectrum we expect to see connected landscapes where semi-natural herds can roam through a much larger area of the countryside. This creates



Starting with fewer numbers of grazing herbivores brings a multitude of benefits

a mosaic of different and ever-changing habitats. It may seem like a far-off ambition, but we should keep thinking about how we can become one step wilder.

Purbeck Heaths National Nature Reserve in Dorset has established a landscape-scale grazing strategy through its 'Super Nature Reserve' partnership. Led by Dorset Area of Outstanding Natural Beauty, a rewilding strategy has been agreed between stakeholders – including the National Trust, Natural England, Dorset Wildlife Trust and the RSPB – to allow extensive grazing across landholdings using horses, North Devon cattle, longhorn cattle and mangalitza pigs.

This was achieved through the removal of fencing and a formal agreement across over 3200 hectares to allow grazers the freedom to move across landholdings and through the landscape. Although still not on the scale that we would once have seen in Britain, this provides an example of how we can start to mimic vast roaming herds through collaboration and partnership with adjacent landowners.

It's also important to remember that it isn't just about the numbers – herd behaviour is also central to the natural processes created by herbivores. Wherever possible, roaming herds should be a mix of ages, sexes and have developed social structures.

GRAZING CHALLENGES

INTRODUCING LARGE HERBIVORES IS NOT STRAIGHTFORWARD AND REQUIRES CONSIDERATION OF SEVERAL KEY CHALLENGES

FENCING

Rewilding projects would ideally remove all internal fencing in order to allow as much free movement as possible, as would happen in nature. In reality, however, a lot of rewilding projects do not cover an entire landholding, and even where this is the case a project is likely to need perimeter fencing.

GPS collars are available that help to reduce the need for fencing. These collars allow you to create a virtual fence through a mobile app and monitor animal health and movement.

Fencing is expensive, requires maintenance, can prevent the free movement of other wild animals, and can be an eyesore. Wilder Blean, for example, was required to install 40 kilometres of double fencing at a cost of roughly £14.50 a metre to host its bison. Although this is the extreme end of the scale, even with Nofence collars for cattle you will still need a perimeter fence if you are looking to introduce pigs and horses.

The type of fencing you require will depend on the type of animals on your land. Most of the time you'll be fencing animals in (e.g. bison or beaver), but sometimes you'll be fencing animals out. For example, you might need to fence out deer to protect new tree saplings.

FREE MOVEMENT OF ANIMALS IS THE AMBITION

VIRTUAL FENCING

Virtual fencing technology has been around for a few years and is growing in popularity at rewilding projects. Fences can be expensive and difficult to install and maintain in many landscapes, especially large-scale upland locations. They can also discourage or prevent the free movement of animals for which restrictions are not intended. GPS technology allows herbivores to be introduced to projects without the need for fencing. GPS collars also allow rewilding projects to easily monitor where herds are. As well as providing data on how animals are using the land, this helps you to locate free-roaming herds across large areas with ease.

Nofence technology can be used to exclude animals from sensitive areas, such as areas where priority species are being actively managed. You can also use it to mimic an 'ecology of fear' by moving herds around periodically and discouraging prolonged grazing in one area. GPS collars have been approved by Defra for use on cattle, sheep and goats but have not been approved for pigs or horses; more research is needed before this can happen. Adults in cattle herds should be fitted with collars, which cost around £300 each.

External fencing may still be required, however, to stop animals straying onto roads. You may also need internal fencing to contain pigs and horses living with your cattle, as they cannot be fitted with the collars.

LOOKING AFTER ANIMALS

If you're introducing domestic hardy breeds as proxies for extinct herbivores (e.g. cattle, pigs and ponies), a degree of animal care is needed.

Although semi-wild grazers require a lot less human management than animals managed for agriculture, you'll need someone to check them regularly and get occasional veterinary help. There are specific welfare requirements and regulations that usually require daily checks, testing, intervention if an animal is sick and regular vet visits. GPS collars and tags may be useful to assist in locating these



GPS collars can help monitor animals and protect sensitive areas

animals for daily checks, especially pigs! Wild deer don't need looking after but they may require population management through culling.

Managing semi-wild grazing requires a different sort of expertise to managing farm animals, combining traditional farming knowledge with progressive conservation techniques. Be realistic about the amount of time it might take to find someone suitable for this role. Of 60 applicants for a project recruiting a farm and conservation manager in 2021, only four were considered suitable. It might be difficult to find just the right skills, but in time, this is likely to be a popular occupation.

The Knepp Estate employs a stock handler to look after its cattle, pigs and deer. The stock handler is responsible for cattle management, health checks, rounding up the cattle over large areas using the Bud Williams technique, and managing pigs and deer across the estate.

The Exmoor ponies at the Knepp Estate are managed by two specialists, who check their wellbeing and advise on whether veterinary care is needed.

Ongoing knowledge of animal behaviour, legislation requirements, herd behaviour and dynamics, and an understanding of the impact the animals have on the land is important for these roles.

In addition, there are licensing requirements for some animals, including bison and beavers, which may include health screenings. For example, beavers may need to be checked for diseases such as tapeworm prior to release. For licensed animals, you may also have to tag and check any future offspring. Projects will also need insurance that covers semi-wild or free-roaming animals.

FARMING REGULATIONS

Herbivores on a rewilding project are not managed in the same way as traditional animals in agriculture, and in some cases will not enter the human food system. However, under current regulations in Britain rewilding animals are still classed as 'livestock' and are subject to the same management and welfare requirements as farm animals. Learn more about relevant regulations in our guide to [Legislation and Regulation for Rewilders](#).

BEING WILD AND FREE

Rewilding is not about specific goals or having a fixed idea of how the land might look in 50 years' time. Letting nature find its own way, as much as possible, can be a challenge, and requires a different mindset and a flexible strategy. While it's helpful to have a strategy for grazing, don't use it rigidly.

Primarily, grazing in rewilding is about letting small numbers of grazers and browsers roam large areas as freely as possible. Try to enable this by letting the animals work things out for themselves. You may have to impose limits, of course, particularly on pigs that plough fast and fierce. You may also have to move animals through the landscape to mimic an ecology of fear. This can sometimes be achieved through public footpaths or from visitors and staff moving across the land.

In Britain, hardy native cattle are one of the more straightforward ecosystem engineers to accommodate. However, letting them be properly wild is difficult because of legislation governing cattle. This means that grazing across multiple landholdings may not be possible due to disease control, and your grazing is often restricted to your landholding. You will need to consider the space available for herbivores to behave naturally within your rewilding project, and whether they have access to everything they need (water, shelter, etc.).

Social herd dynamics are an important consideration when planning your grazing strategy. Larger herbivores such as cattle and horses are naturally part of a herd. In the wild, mixed herds roam the landscape. For horses, it is recommended that you introduce at least five or six animals to your rewilding project to replicate this natural behaviour.

Most rewilding projects in Britain manage herds so that they are largely female dominant. Bulls and stallions are generally kept away from the herd for safety reasons and to control breeding. However, this means the herd won't exhibit important behaviours that have an impact on their surroundings. For example, the piling of dung by stallions is part of territorial behaviour, and provides opportunities for invertebrates. Rutting behaviour by bulls and horses leaves patches of bare earth, creating opportunities for pioneering plants. In areas where natural herds can be established, this provides additional benefits to ecosystem health.

NUMBER MANAGEMENT

In large-scale projects with permanent large herbivores you'll need to control populations through culling: we have no large predators in Britain to do this naturally. Deer management is critical in places, for example across much of Scotland, where for over a century soaring red deer numbers have had a devastating impact on regenerating woodland.

It's not just deer, though. Growing populations of cattle and pigs also need to be kept in check. This provides an opportunity for rewilding projects to harvest, and potentially sell surplus, high-quality, pasture-fed meat. Horses are not usually culled in Britain – they are moved to other rewilding or conservation projects. However, one day we may also see wild horse meat on the menu!

MONITORING IMPACT

What impact are your grazing and browsing animals having on your land? How do you know if they are suppressing or helping natural processes such as regeneration? Monitoring the impact of herbivores (and other actions) is an important part of rewilding. Observations should be used to inform and revise your strategy.

Forestry and Land Scotland has developed a methodology for assessing herbivore impact. It involves walking the site and recording herbivore impacts on vegetation including bark stripping, ground disturbance and browsed plants.

Such a survey should be carried out every winter, and can be used to identify hot spots of activity and check whether your herbivores are reaching all areas of the project or whether some areas are being left to naturally regenerate. You can also monitor changes in habitats and vegetation structure to assess the impacts of grazing animals.

For more information on monitoring, see the [Rewilding Monitoring Framework](#).



Observing and monitoring herbivores is key when developing a rewilding strategy

3. NATIVE HERBIVORES

CONTENTS

In this section we highlight the role that grazing animals can play in rewilding, and profile the native large herbivores in British ecosystems: wild boar and pigs, cattle, deer, horses and ponies, bison, elk and beavers. We include an overview of considerations, including the expertise required.

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WILD BOAR AND PIGS

THESE ROOTLERS ARE RESILIENT CHURNERS OF THE EARTH, BREAKERS OF BRACKEN AND HABITAT REGENERATORS



AT A GLANCE



Preferred habitats: woodlands



Rewilding role: rootling, scenting, wallowing, seed dispersal



Space needed: 40+ hectares



Native breeds: the UK has 11 native pig breeds

BACKGROUND STORY

Wild boar used to be common in Britain's woodlands but lost ground as agriculture fragmented their homes. They became extinct in the 13th century because of excess hunting and control to safeguard crops. However, wild boar meat remained prized and has been farmed since then, and members of the landed gentry still wanted to hunt boar so imported and released animals from France. The escape of a few bold captive boars led to the re-establishment of wild populations. They are currently found in the Forest of Dean and in low numbers in several areas of Scotland.

Wild boar are not recognised as a wild native species so cannot be reintroduced officially at present. They are listed on the Dangerous Wild Animals Act 1976. However, native pig breeds can play a similar ecological role for rewilding projects that do not have wild boar nearby.

REQUIRED EXPERTISE

You will need to bring in expertise to identify the breed of pig most suited to your site, and to provide specific information around fencing requirements (pigs are great escape artists and particular care should be taken with fencing). For the welfare of animals and stock handlers, anyone who interacts with pigs should be shown the correct handling techniques. New keepers should find an experienced mentor to help them become skilled in the safe handling of pigs, and will need training on pig management and welfare. It can be tempting to treat pigs as tame animals but it should be remembered that the purpose of introducing proxy animals in rewilding is to mimic the wild species that are absent: human contact should be kept to a minimum.

PERMISSIONS, COST AND SPACE

Because wild boar are listed under the Dangerous Wild Animals Act 1976 they cannot be reintroduced to the wild without a licence. Hardy pig breeds are accessible alternatives. They cannot serve all the same ecological functions as their wild counterpart, but will play a similar ecological role. You will need to seek expert advice on the number of pigs and the most suitable breed for your site conditions. Local breeds including Tamworth pigs and Iron Age pigs have been used on several rewilding projects.

You will need at least 40 hectares to accommodate pigs on a rewilding project. Key considerations are strong fencing and access to fresh water. You must also check your pigs daily, so it is worth considering GPS tags to keep track of them, particularly as land starts to scrub up.

Although wild boar like nothing more than rootling around in the soils of woodland and shady glades, they are omnivorous and will eat a wide range of food when the opportunity arises. This can cause problems if they wander on to farm crops, horse paddocks or the prized turf of a village green.

TO KEEP IN MIND

- Tamworth pigs are the most common proxy species for wild boar in Britain. They are known for their hardiness and ability to find food in the wild. Another breed to consider is the Iron Age pig, a hybrid between wild boar and domesticated pigs.
- The Rare Breeds Survival Trust estimates that there are fewer than 300 registered breeding Tamworth females in the UK.
- Pigs live in female groups and are a social animal.
- Wild boar and pigs have been known to become aggressive in their eagerness to eat. They also dislike domestic dogs, and you should consider how and where visitors are likely to interact with your site. Keeping dogs away from areas where you know the animals are frequently active will minimise the risk of conflict. Signage is important, particularly when the animals are rearing young.
- You will need to install a perimeter fence for your site if you are introducing pigs. Make sure that it is to a suitable specification to prevent their escape!

Find out more: [Rare Breeds Survival Trust](#)

CATTLE

OUR HARDY CATTLE BREEDS ARE DESCENDED FROM AUROCHS AND ARE AT HOME SHAPING BRITAIN'S LANDSCAPES



AT A GLANCE



Preferred habitats: grasslands, shrublands, woodlands



Rewilding role: create diverse, open landscapes through lawn grazing, bark stripping, branch breaking, path making and trampling



Space needed: a small herd needs 40+ hectares; a larger herd requires 1000+ hectares



Native breeds: the UK has 34 native cattle breeds, and most areas have (or had) a local breed

BACKGROUND STORY

Our native cattle are descended from the ancient, extinct aurochs. Aurochs were bigger than all of the cattle species alive today and would have trampled, crashed across and dramatically shaped Britain.

Hardy breeds of cattle are the closest we have to aurochs. These breeds are adapted to our environments and can be kept out year-round – even in our harsh upland habitats – as long as they have enough natural shelter.

REQUIRED EXPERTISE

Cattle have to be managed legally as livestock, even if they're semi-wild. If you're not used to managing farm animals, you'll need the help of an experienced stock handler. However, managing cattle as semi-wild herbivores for rewilding is quite different to managing cows for dairy or meat-rearing purposes. Combining animal husbandry with ecological and rewilding expertise is vital. Cattle should be managed so that they can form semi-wild herds and behave naturally.

PERMISSIONS, COST AND SPACE

Legislation governing livestock means that letting hardy cattle be properly wild is difficult. There are a number of legislative and welfare requirements, including daily health checks and TB testing. Grazing across more than one landholding may not be possible due to disease control requirements. Carcasses cannot be left out for scavenging.

Cattle are expensive to maintain: robust fencing is needed, and in many cases it can take significant time and expertise to ensure that you have a healthy herd. You will also need appropriate handling facilities and a cattle crush wide enough to accommodate cattle with horns.

TO KEEP IN MIND

- Different cattle breeds suit different conditions, so consider your geography and climate and choose accordingly. You should also consider the provenance of your animals; animals acquired from a lowland site may struggle on an upland site, for example.

- Different breeds of cattle, and individuals within a herd, have different personality traits, such as how placid or excitable they may be around people. Do you hope for visitors? Does a public right of way cross your land? Do you expect dogs on site? Consider who may be on your land and select breeds accordingly, or breed for temperament.
- Consider the use of local historic breeds if possible. This provides an opportunity to support local identity and cultural heritage. Rewilding is about restoring a sense of place as well as restoring natural processes.
- One cow needs between 40 and 125 litres of water per day, and you will have a herd. Do you have enough clean water bodies available on your land to meet this demand, and are they accessible to large, heavy animals? Is the water distributed to avoid trampling and compaction of soils from congregating animals? This damages soils and can become dangerous if slippery.
- Cattle can have a big impact on small trees: they tear leaves and twigs rather than nipping with their teeth. This can kill affected trees and shrubs. Can your woodlands handle this?
- Bulls aren't usually out all year, as they will cover heifers. Although we want to recreate natural processes, this can be a management challenge and needs consideration. Normally, heifers come out when bulls go in and vice versa. You will need somewhere to keep heifers or bulls if you are following this approach.
- Sometimes cattle need assistance with calving – do you have the infrastructure and space for this?
- Consider using GPS collars on some animals in your cattle herds, which makes it much easier to locate the herd during daily checks.
- Provide visitors with information about the role cattle play in ecosystems and how to behave around them.

Find out more: [Rare Breeds Survival Trust](#)



DEER

DEER ARE KEY SHAPERS OF LANDSCAPES, BUT BECAUSE THEIR NATURAL PREDATORS HAVE GONE THERE ARE OFTEN TOO MANY



AT A GLANCE



Preferred habitats: woodlands, grasslands



Rewilding role: a key woodland shaper that determines growth and structure of habitats



Space needed: depends on geography of land, population numbers and available food, but as a minimum a herd of roe deer tend to be active over several hundred hectares



Native species: red deer and roe deer

BACKGROUND STORY

Deer numbers have varied significantly over the centuries. Britain's native red deer and roe deer were almost extinct in Wales and England by the 18th century due to hunting and the loss of forest habitat. Now, the roe is widespread, while red deer, Britain's largest deer species, is found almost exclusively in the Scottish Highlands. Fallow deer, believed to have been introduced to England by the Normans in the 11th century, are present throughout Britain but are particularly abundant in southern England.

REQUIRED EXPERTISE

Deer are a natural part of our ecosystems and contribute positively to biodiversity when their population numbers stay within the capacity of the land. Where present on rewilding projects, they should be regarded as wild animals and left to graze and behave naturally. Management requires the monitoring of their impact on vegetation and deer counts. Culling and/or exclusion using fences may be required where there are high numbers, especially during the early stages of a rewilding project while vegetation recovers. Once vegetation has become established it may be possible to support more deer without negative impacts on ecosystems.

Culling should be undertaken by qualified stalkers who work diligently and humanely to mimic the action of predators, and should be coordinated with the local deer management group if one exists. It can be an emotive topic, but it's important to remember that deer no longer have natural predators in Britain. The presence of natural predators would limit deer numbers in the wild, keep them moving and help prevent overgrazing. Stalking is a poor substitute for restoring this predator-prey dynamic, but targeted stalking in important areas can help.

PERMISSIONS, COST AND SPACE

It's unlikely that deer will need to be introduced to rewilding projects because they may be there already in high numbers. However, the introduction of red deer to some rewilding projects in England and Wales could be useful. Natural England grants licences to translocate deer from one area to another.

Red deer need space to roam, but how much space depends on the geography of the land, their population and available food. Stags may range over a 1000 hectares in moorland areas in search of food. Roe deer need significant space and tree cover for foraging.

Deer fencing is expensive, whether you are trying to keep deer in or out. Deer fencing is also higher than normal fencing – between 1.5m and 2.25m high depending on the species. It can be difficult to install, especially in rough upland areas. If you have footpaths on your site, gates must be designed to allow people through. When fencing to keep deer out you should consider the impact on your neighbours (the deer will move on to their land) and the proximity of your site to roads.

TO KEEP IN MIND

- Deer lack a wild predator and so tend to heavily graze habitats. Start with a herbivore impact assessment to determine whether deer are suppressing vegetation growth. If they are, consider a thermal imaging survey to inform your management strategy.
- Management of deer numbers may be required within rewilding areas, especially at the start of a project, to allow vegetation to recover.
- Investigate whether your land falls within a local deer control area and consider how this fits with your project. Large projects may be able to undertake control without needing to coordinate with neighbours, but smaller projects will need to work with neighbours. Deer move across landscapes and best practice guidance is to manage control on the area of land they cover rather than on just one landholding.
- In warm, lush environments, red deer body weight and antler size increases dramatically.

Find out more:

[The British Deer Society](#)

[Deer Initiative Best Practice guidelines](#)

[NatureScot Best Practice guidance](#)

WILD HORSES AND PONIES

FREE-ROAMING HORSES AND PONIES GRAZE TOUGHER GRASSES, PLAYING A KEY ROLE IN REWILDING



AT A GLANCE



Preferred habitats: woodlands, grasslands, shrublands



Rewilding role: path making, trampling, scenting, wallowing, seed and nutrient dispersal, maintaining diverse, open habitats



Space needed: at Wicken Fen (see page 32), konik ponies graze just over a hectare per head year round



Native breeds: Dales, Dartmoor, Eriskay, Exmoor, fell, Highland, New Forest, Shetland, Welsh mountain

BACKGROUND STORY

Domestic horses and ponies are a familiar feature of the British countryside. They are descendants of the extinct wild horse that was once widespread across northwest Europe, including the British Isles. Subspecies of the wild horse include the modern domesticated horse and the extinct tarpan (native to Europe and western Asia). The endangered Przewalski's horse (native to Mongolia) is a separate species.

Hardy breeds have characteristics that are derived from the extinct wild horse. Many of these breeds are adapted to local environments and have cultural traditions associated with them.

REQUIRED EXPERTISE

A genetically diverse founder population will quickly revert to natural behaviours and demand little day-to-day intervention, beyond ensuring their welfare. Feral horses will live as one large herd, but can have multiple groups within that herd. These sub-groups often comprise family harems, bachelor bands or mixed-sex bands of sub-adults.

Wild horses can be difficult to handle and require a lot of patience, especially natural herds of mixed ages and sexes. Larger projects should handle horses very little, if at all. It's important to consider how natural herd dynamics and behaviours may affect walkers and horse riders if there is public or permissive access across the land. For many projects, bachelor groups might be considered too dangerous and a strategy on what to do if these start forming will be necessary.

Projects should consider whether to officially breed from animals. If so, the herd will need to be registered with the relevant breed society. Subsidies are available for breeding, but require breeding to be monitored (including which males are siring foals) and foal inspections. By law, all horses must be microchipped and passported. Breeding can maintain healthier herd dynamics and be better for the ecosystem, but you need to consider the capacity of your project.

Horses need monitoring for common equine ailments such as laminitis and sweet itch. Regular health checks are advised, ideally daily. See the [equine welfare Code of Practice](#), which includes free roaming. A supportive vet who

understands rewilding and minimum intervention is useful for rewilding projects. This is particularly the case for worming – worm counts (from faeces samples) are preferable to routine worm treatment. Ideally, foot trimming shouldn't be necessary. If it is, the habitat/lifestyle may not be suitable for the breed/individual. Handling can take place in a cattle crush or specially adapted pen system.

PERMISSIONS, COST AND SPACE

Natural grass productivity will (in part) determine the carrying capacity of a site. Nutrient-rich floodplains are able to support more animals in a smaller area than dry, sandy or chalky soils. Today, wild horses thrive best on grasslands, shrublands and wood pastures.

Wild horses will readily drift onto arable and improved grasslands in search of grazing opportunities, so boundary fencing is required even for large projects. Connecting with neighbouring projects and allowing cross-project movement of horses will create a more natural mosaic across the landscape. Movement of horses should be easier than cattle.

TO KEEP IN MIND

- Hardy breeds are good proxies for the wild horse, but behaviour varies between breeds and potentially herds. For example, some breeds eat more woody vegetation than others, or are better suited to poor weather and biting insects.
- In some cases ponies and horses may improve the grazing for cattle by eating the toughest grasses and thatch. This opens up the soil, creating opportunities for the sweeter and more tender grasses favoured by cattle.
- Horses are happy to graze in pairs, so can be appropriate for smaller sites. However, we recommend a minimum of three horses in a herd. At least five horses is ideal because it will create a more natural herd structure.
- Ponies grazing a mosaic of habitats can develop mineral deficiency when grazed outside year round without supplements: you may want to consider mineral licks across the project.

Find out more: [Rare Breeds Survival Trust](#)



EUROPEAN BISON

THROUGH GRAZING, FORAGING, WALLOWING AND TRAMPLING, BISON BOOST HABITAT DIVERSITY



AT A GLANCE



Preferred habitats: grasslands, wetlands, woodlands



Rewilding role: bark stripping, trampling, wallowing, seed dispersal, creating open habitats



Space needed: from tens to thousands of hectares

BACKGROUND STORY

The European bison became functionally extinct in Europe in the 1920s and was only saved by a zoo in Poland. Conservation breeding from the few surviving animals, and subsequent reintroductions in countries such as Poland, Germany and Romania, have led to its remarkable recovery. The first wild bison came to England in 2022 when they were introduced in Blean, Kent (see grazing study on page 26–27).

The European bison is not native to Britain, but its close relative, the globally extinct forest bison *Bison schoetensacki*, was here, at least during the Pleistocene. The surviving European bison is a suitable surrogate for this extinct species.

REQUIRED EXPERTISE

You will need expert advice if you are looking to introduce bison to your project. For its Wilder Blean project Kent Wildlife Trust partnered with Wildwood Trust, an animal conservation charity and member of the British and Irish Association of Zoos and Aquaria. Wildwood Trust helped with sourcing bison and working through feasibility plans. The animals were introduced under a Zoo Licence, which means that they have specific requirements (for example strict fencing and no public access). Another route to expertise is through Rewilding Europe, which runs the European Wildlife Bank and distributes herbivores to rewilding projects.

PERMISSIONS, COST AND SPACE

Bison are listed on the Dangerous Wild Animals Act 1976 and so will need a reintroduction licence and regular welfare and disease checks. The fencing specification for the enclosure will need to consider the animal's size and strength, and as a result will probably be more costly than more traditional stock fencing. Wilder Blean installed 40km of double fencing costing around £14.50 a metre. The outer fence is 1.9m tall; the inner fence is electrified and is 1.4m tall. There is a 4m gap between the two fences. If there are rights of way on your land it may not be appropriate for bison, because current regulations require you to limit the risk of interaction between the animals and the public. Although wild bison can coexist with people, they can be aggressive if visitors get too close or if dogs are present.

Bison have been successfully reintroduced to relatively small nature reserves in Europe, suggesting areas anywhere from a few tens to hundreds or thousands of hectares will be suitable. A bison's home will ideally comprise scattered woodland and open shrubby grasslands. This might include arable land that is reverting to these habitats. They like to visit floodplains in summer.

In mainland Europe bison are classified as cattle. This is mostly to meet policy and legislative requirements and means that the animals must be ear-tagged and must have the same paperwork as cattle. Space and the social structure of herds are key to bison reintroduction.

TO KEEP IN MIND

- Bison eat up to 60kg of food each day and have a dramatic impact on vegetation, keeping open land open and creating a mosaic landscape.
- Bison form family groups and small herds of around 10 animals.
- A recent study showed that increased visitation by European bison reduced the density and volume of trees and shrubs.
- Data emerging from Europe suggests that bison can have unexpected influences on other species, highlighting their role as a keystone species. For example, songbirds in Poland appear to benefit from the presence of bison and have been seen using bison fur to line their nests, resulting in better chick survival.
- Bison strip more bark than cattle, which prefer to browse on twigs. Bison have a greater impact on woody plant survival, suggesting that they play a unique role in creating a mosaic of habitats, which cattle alone do not.

Find out more:

[European Wildlife Bank](#)

[British and Irish Association of Zoos and Aquaria](#)

EURASIAN ELK

A WOODLAND FORAGER AND WETLAND GRAZER, ELK ARE A MAJOR SHAPER OF LANDSCAPES



AT A GLANCE



Preferred habitats: woodlands, grasslands, wetlands



Rewilding role: bark stripping, fraying, wallowing, seed dispersal, creating open habitats



Space needed: several square kilometres to several hundred, depending on food availability

BACKGROUND STORY

The Eurasian elk, known in North American and Scandinavian countries as a moose, is an enormous semi-amphibious deer that became extinct in Britain around 2000 to 3000 years ago. Excess hunting across Europe in the 18th and 19th centuries caused substantial population declines and loss of range, but the Eurasian elk survived and is now the largest living deer in existence. It is widespread in Scandinavia and Poland and is slowly moving west. There are now around 50 elk in the Oder Delta on the Polish–German border.

REQUIRED EXPERTISE

You will need expert advice if considering elk for your project. It is likely that any project looking to reintroduce elk will need to work in partnership with zoos such as Wildwood Trust to ensure that appropriate licensing is in place and animal welfare checks are undertaken. Any elk reintroduction programme should have a large area available, to allow the animals to graze, move and behave naturally. A feasibility study will also be needed, with consideration given to future climate: elk struggle to survive in high temperatures.

PERMISSIONS, COST AND SPACE

Elk are listed on the Dangerous Wild Animals Act 1976, which bars their introduction to the wild unless under licence. By law you will need deer fencing around your elk enclosure to prevent the animals from entering the wider landscape. Any application for a wild elk reintroduction will involve multiple stakeholders, feasibility studies and engagement for at least two years before it can take place. It is likely to be a costly project and should be undertaken in partnership.

Mostly, elk are solitary animals, but they may form small, loose groups in winter. This means that any reintroduction must offer enough space for elk to roam.

When settled, elk occupy a home range of between several square kilometres and several hundred square kilometres, depending on food availability. In Europe their population size is regulated largely by wolf predation and the quality of habitat, particularly the availability of food. They make seasonal migrations of tens or hundreds of kilometres in some parts of their northern European range.

TO KEEP IN MIND

- Elk thrive in areas with seasonal snow cover and don't tolerate temperatures above 27°C for long: the fermentation from their digestion creates large amounts of heat and they cannot sweat.
- Elk are brilliant underwater foragers and can submerge fully to feed. They are unsuitable for projects without significant areas of wetland.
- Elk are considered a dangerous animal under the Dangerous Wild Animals Act 1976 and any reintroduction is likely to have rigorous fencing and access requirements.
- Elk and beaver have co-existed for thousands of years, and their behaviours complement each other. Beavers help create better conditions for elk through their wetland-creation activities. The creation of beaver ponds and coppicing of trees provides new foraging opportunities for elk.
- Like other deer species, elk shed their antlers annually. Antlers are primarily used for defence against predators (wolves and bears), and during mating season. Due to the absence of antlers and their smaller size, young elk are more vulnerable to predation than adults and mothers will defend them vigorously.

Find out more: members of the Large Herbivore Working Group can help advise on elk reintroductions

BEAVERS

NATURE'S BUSY AQUATIC ARCHITECT IS A FORMIDABLE TREE FELLER, RIVER CHANGER AND WETLAND CREATOR



AT A GLANCE



Preferred habitats: rivers, wetlands, woodlands



Rewilding role: bark stripping, damming, tree cutting



Space needed: a couple of hectares minimum, including freshwater habitat and an ample supply of trees and shrubs. Final territory size depends on food availability

BACKGROUND STORY

Europe's largest rodent was hunted to extinction in the UK for its fur and a natural secretion called castoreum, which was used for perfumes and medicine. A decline followed in mainland Europe, with the population plummeting to almost 1000 across the continent.

Beavers have become a major reintroduction success story in Britain and in the rest of Europe. They were first legally introduced to Knapdale in Scotland and a thriving wild population has been expanding from the River Tay catchment. In England, there are wild beavers on the River Otter in Devon and in enclosures in many counties. The North Wales Wildlife Trust and the Welsh Beaver Project released a beaver family into an enclosure on the Dyfi nature reserve.

REQUIRED EXPERTISE

Beaver reintroductions take time and effort. You'll need to have detailed plans, the necessary infrastructure, conversations with neighbours and other partners or stakeholders. This might require a project lead or larger team.

You may need help identifying the most suitable land for beaver introductions and in completing a licence application. Many landowners with beavers have worked with the Beaver Trust and beaver expert Derek Gow, who provide help and advice on enclosure fencing, licensing and how to source beavers for your project.

PERMISSIONS, COST AND SPACE

You need permission to introduce beavers, even into enclosures. Natural England, Natural Resources Wales and NatureScot are responsible for beaver licences in England, Wales and Scotland respectively. Licences require you to have appropriate measures in place such as fencing, health screening and the expertise to bring the animals onto the landscape, and measures in the event of any escapes.

Although beavers are classified as a native species in England, wild licences have not yet been approved. Therefore, beavers must still be introduced in enclosures. There are wild populations across several catchments, though, so if you are in the right area they may naturally reach your land.

TO KEEP IN MIND

- You'll need freshwater on site. At the Forest of Dean they only had a shallow stream but dug out extra ponds in which to release the beavers. Beavers use water to escape threats, and can create new ponds through dam construction and by digging out channels known as 'canals'.
- You might need to plant trees if there aren't many and have natural regeneration happening before introducing beavers. Beaver foraging will kick-start new regeneration of trees and vegetation, therefore creating a continuous food source.
- Consider the impacts of beavers within 50 metres of the water source. They will forage on vegetation such as orchards (trees and fruit) and ancient trees if they are close enough to water. These can be safeguarded through fencing if they're likely to be at risk.
- Beavers browse other vegetation including non-native morsels such as Himalayan balsam or Japanese knotweed. They'll move up to 50 metres from their water habitat to forage if there's good cover.
- The University of Exeter is developing a map of suitable beaver habitat, which will help landowners identify places where beavers could live.
- Animals released into enclosures will need monitoring, and population management will be necessary because the beavers won't be able to naturally move into new territories. Wild populations are also likely to require some form of management and mitigation.

Find out more: [Beaver Trust](#)

A WORD ABOUT SHEEP AND GOATS

SHEEP AND GOATS ARE OFTEN USED IN CONSERVATION GRAZING TO HELP CERTAIN SPECIES AND MAINTAIN HABITATS, BUT THEIR ROLE IN REWILDING IS LIMITED

Primitive and modern domestic breeds of sheep are a common sight on the hills and slopes of Britain's lowlands and uplands. They're mostly kept as commodity livestock or to graze habitat on farmland and nature reserves that's considered culturally important.

Their place within rewilding projects is questionable because they don't fill a niche vacated by a native species. Retaining a very low number of sheep may be appropriate for some rewilding projects, perhaps if the site contains a grassland SSSI that's traditionally been subject to sheep grazing. Primitive breeds of sheep can have a place in conservation grazing of habitats considered culturally important, and within high-nature-value farming systems. Rewilding is about being as non-prescriptive as possible, but that doesn't mean giving up on special, rare and threatened species. It makes sense to maintain special areas of conservation in the expectation that the rare species they contain may expand their range over time. Sheep and goats may play a role in these limited circumstances.

NEW IN ECOLOGICAL TIME

Sheep are a new animal to Britain in terms of ecological time and were introduced to Britain around 4000 years ago. They are probably descended from the wild mouflon, which originates in the Middle East and is at home in mountainous, lightly wooded country close to the tree line. In Britain, the species is non-native; our ecosystems have not evolved alongside them. Centuries of sheep grazing have stopped woodlands growing and instead created very tightly grazed, species-poor swards, as seen across many of Britain's shorn hillsides.

Much the same can be said of goats. These voracious, non-native nibblers can halt tree growth and damage woodlands. Occasionally, though, they're great for conservation grazing of a particular habitat, such as that of the Avon Gorge in Bristol.



While they have no role in rewilding, the grazing habits and agility of goats can be important for species-specific conservation

Designated an SSSI and a SAC, the gorge is considered one of England's top three sites for rare plants including the shade-intolerant Bristol rock cress, Bristol onion and hutchinsia. Many of these low-growing plants were clinging to rocky outcrops, cliffs and short grassy slopes over shallow soil and limestone but had thrived thanks to centuries of sheep grazing, which halted the growth of scrub. When sheep grazing stopped, these rare plant species all but disappeared. To save them, Avon Gorge and Downs Wildlife Project introduced hardy ancient-breed goats in 2011 to limit scrub regrowth (which included non-native species such as holm oak and black pine). The goats are agile on the steep slopes, like to strip bark from trees, and browse woody scrub and soft rushes. They also eat tufted grass seed heads and bramble rather than the leaves of finer grasses or herbs.

The goats do what's needed to maintain habitat for the rare plants that have found a niche in the gorge. It's not rewilding but it's a valid choice of management to achieve a particular goal, especially where there is a need to protect the best and rewild the rest.

IN CONCLUSION

In most rewilding projects in Britain, where the aim is to reinstate natural processes as much as possible, sheep and goats have less of a role to play. Where sheep and goats are still stocked on a rewilding project, it tends to be outside the area that's officially classed as rewilding. They are used for conservation grazing; around 2% of land managed in conjunction with rewilding areas is being conservation-grazed in this way.

Sheep and goats are complementary to rewilding. They can help special fragments of species-rich habitat to survive while we work towards large-scale, species-rich landscapes where booming biodiversity is the norm and not the exception.

4. EXAMPLES IN THE FIELD

CONTENTS


In this section we share examples from the field, from the introduction of beavers in the Highlands to the arrival of bison in Kent. We show how rewilding projects have introduced herbivores in practice, and set out steps that land managers have taken to ensure success.


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





WILDER BLEAN: AT A GLANCE

 **Location:** Kent, England

 **Grazing numbers:** six European bison, six longhorn cattle, six Exmoor ponies and six Iron Age pigs

 **Site size:** three zones between 200 and 250 hectares each (490–620 acres)

 **Habitat:** ancient woodland, conifer and chestnut plantation, heathland, scrub

STUDYING THE IMPACT OF BISON

For the first time in 6000 years bison graze again in England. They were introduced to an experimental project in Kent in the summer of 2022. They are European bison, a surrogate for the now-extinct British steppe bison, and their new home is West Blean Wood near Canterbury.

Kent Wildlife Trust and Wildwood Trust are spearheading the project, with support from the neighbouring 500-hectare British Wildlife Centre. The project was predominantly funded through a £1.125m grant from the People's Postcode Lottery Dream Fund.

IN THEIR OWN WORDS

Why introduce grazing animals to Blean?

Blean is one of the largest areas of ancient woodland in the UK, but almost half the site was planted with non-native conifers that have little wildlife value. We spent many years removing conifers, but that takes a lot of people, chainsaws and large machinery. Plus, 150 hectares is too much for volunteers to coppice and we were unable to claim stewardship funding for the work. As the bison roam, they'll destroy the remaining trees or push them over. We hope they'll be a cost-effective and natural way of managing woodland and that they boost biodiversity and make the site wilder.

Their movement through the woodland will also allow light to reach the forest floor, encouraging biodiversity. We can mimic some of this activity through coppicing, but bison bring a multitude of specific ecological actions to woodland that humans cannot recreate. As the bison reshape the Blean woodland its structure will be transformed from a uniform habitat into a heterogenous mosaic of vegetation that benefits a more diverse mix of species.

The bison behave in a way that no other animal can and they're here to do an ecological job. They've done a great job in the Netherlands and we want to prove their worth in the UK.

Which species have been introduced to the site?

Four European bison were introduced – three females (including one matriarch) and one male. They came from elsewhere in Britain and Germany. Shortly after they arrived

one of the females unexpectedly gave birth to a female calf, bringing the total number of bison on the site to five.

We've also brought in Exmoor ponies, longhorn cattle and Iron Age pigs. The pigs are a domesticated equivalent of wild boar for which we'd have needed a licence, because boar are classed by law as a dangerous wild animal. No licence is needed for Iron Age pigs and their rooting in and churning of the soil gives seeds a chance to germinate (see page 17 for more on pigs and wild boar). The Exmoor ponies reflect our move away from the konik horses that were here until recently.

Our land is too dry to suit koniks, plus they'd become very used to people and mostly lived on a diet of carrots and polo mints. We needed animals that would do their job and not be distracted, and we think Exmoor ponies will be better at keeping the project's wild character by taking advantage of areas the bison clear. Highland cattle were here previously but couldn't push through heavy vegetation in the way that bison can, so the places the ponies could access was limited.

The Exmoors browse branch ends and grasses, and nibble a few tender birch leaves, bark and stems, but on their own can't reach denser vegetation or bramble, or keep on top of larger areas of clear felling. The bison will forge ways through denser vegetation and create deadwood. That will help prevent uniform regenerative birch scrub developing.

How large is the area in which the herbivores are active?

We created three grazing zones, each containing a similar mix of ancient oak woodland, old plantations with Corsican pine, and sweet chestnut coppice, plus an open matrix of heathland and birch scrub on a clay and sand substrate.

The grazing in each zone differs: there is now a 205-hectare bison zone, a 260-hectare traditional domestic grazing enclosure, and a 100-hectare ungrazed control area. Longhorn cattle occupy the domestic grazing area; Exmoor ponies and pigs graze the bison and grazing zones.

This is how the animals would live in the wild, where they would have helped to provide food for each other, the bison pushing into denser vegetation and the ponies and others following their paths.

Bison breed slowly, so the carrying capacity of the land shouldn't be an issue for a while. When their numbers do increase, bison meat will not be on the lunch menu. Bison are a vulnerable species so if we reach carrying capacity, some animals will go into a Europe-wide breeding programme.

What preparation was needed to bring bison back?

Sourcing and erecting fencing was the biggest task when preparing the site for the bison. We opted for metal Clipex posts, and double-fenced the site. The outer fence is 1.9m high. There is a 4m gap between that and an electric fence, which is 1.4m high.

We had to ensure there was enough water for the animals. The old pine plantation disturbed the water table so we dug new ponds to allow water to pool and make it accessible to heavy animals. There are few wild deer here so grazing pressure is minimal, and we're in a low-risk area for bovine TB. The bison still need to be health screened, though.

Soil health is really important so we don't want to use chemical treatments on the animals. If they ever need worm or parasite treatments they will be taken to a quarantine site. More studies are needed into what the natural parasite load for a bison is. We'll be testing gut fauna, dung and daily health.

Costs of the project

The price of the animals themselves was low, so by far the greatest cost was fencing and the transport of the bison from mainland Europe to Kent. We installed 40km of double fencing. Cost per metre varies a lot because of any clearance works needed, but installing the double fence alone would be in the region of £14.50 a metre.

It was while looking for a cheaper way of managing the plantation that the bison idea arose. There are four bison grazing projects in the Netherlands. In Haarlem, bison have been used to restore a site for the last 15 years. There is now free public access to the area; the bison are a popular visitor attraction.

There is potential for bison ecotourism here, too, which will bring in a small income. We're creating tunnels to allow the animals to pass beneath raised public footpaths. Bison viewing platforms along the path will enable people to enjoy

safe access from a vantage point. Carbon-offsetting is something we're looking into, to help with funding.

What have been the biggest challenges?

The greatest challenges have been securing Lottery Grant funding, installing the fencing and creating the ponds. Animal welfare and husbandry plus safety regulations and monitoring will be significant in the future. Our partnership with Wildwood Trust is paying dividends: the Trust has expertise in caring for bison at its wildlife park in Kent. We've also learnt a great deal from visits to bison projects in the Netherlands.

The project has to comply with dangerous wild animal regulations even though bison are relatively easy to maintain once the fencing is in place. The strict fencing requirements mean we have to isolate our site from other native mammals such as foxes and badgers but we're designing pig gates and we will teach the pigs to use them so they can move between the grazing zones. The animals will also have GPS collars for monitoring.



By rubbing against bark, bison create standing deadwood that's vital for various species

Advice for other landowners

Our stakeholder consultation was extensive. It was important to have a strong concept worked out in advance and to keep our messaging consistent. I've been struck by how supportive local people have been.

Ours is the first bison reintroduction project in Britain. The key for other landowners will be to partner up with experts such as Wildwood Trust to ensure that projects are suitable and to advise on fencing, licensing and animal welfare.

What monitoring will Blean carry out?

Our grazing trial will keep an eye on the site's 218 priority species, including the heath fritillary butterfly, for which Blean is designated an SSSI. In the 1970s, this butterfly faced extinction, but in 2020, 2200 were found here. The species relies largely on cow-wheat, a scarce plant of heathland, but also uses ribwort plantain and foxglove. In theory, the creation of more open spaces by our grazers should encourage cow-wheat to spread, so long as it doesn't become their favourite food. Bison eat at least 30 different coarse herbs, and woody material from trees. Cow-wheat would have evolved with them.

Our monitoring also includes soil sampling and worm counts, other insects, birds, mammals and vegetation structure, to see how different grazers drive the ecology. University students and researchers are involved with this and we're using the survey methods used by the Knepp Estate and Wild Ken Hill in Norfolk so that results can be compared.

Other priority species are the dormouse, white admiral butterfly, white-spotted sable moth and the lesser-spotted woodpecker. We expect our woodpeckers will do well out of this because the bison will increase the amount of standing dead wood they can use as nesting holes. One of our guiding principles is that wild places are transient. We've recorded more than 2800 species here but some may change over time.

Find out more:

[Kent Wildlife Trust: Wilder Blean](#)

[Rewilding Europe: Bringing back the bison](#)



CASE STUDY: RESTORING ANCIENT WOOD PASTURE

EBERNOE COMMON: AT A GLANCE



Location: West Sussex, England



Grazing numbers: cattle and konik ponies (seasonally)



Site size: 157 hectares (390 acres)



Habitats: wood pasture, heathland, ex-arable

BOOSTING DIVERSITY WITH LARGE GRAZING ANIMALS

Ebernoe Common Nature Reserve is dominated by old wood pasture where commoners would have turned out their cattle or pigs to graze and browse, but grazing had stopped by the middle of the 20th century and the wood pasture became increasingly overgrown. Squirrels and deer have caused significant damage to trees at the reserve. Although not covered in this guide, don't forget to account for the activities of small animals such as squirrels, rabbits and geese when considering the grazing processes on your land.

IN THEIR OWN WORDS

Why introduce grazing animals to Ebernoe?

Commons grazing has been part of our landscape for centuries. People let their animals graze the woods of Ebernoe Common until the Second World War, and there's evidence that pigs were turned out here as late as the 1960s.

Grazing would have shaped the woodlands, creating open areas of wood pasture that would have been home to a stunning variety of wildlife. When the grazing stopped, the dynamic nature of the woodland disappeared and wildlife declined: the loss of light and loss of open glades dramatically reduced the number of species that could thrive here.

Which animals were introduced?

We reintroduced konik ponies and two hardy breeds of cattle, the Sussex and the British white, 20 years ago to restore the wood pasture that had been so important to wildlife. The Trust may eventually use Sussex cattle only, because they're better suited to the rough ground.

On the neighbouring ex-arable site, the challenge was to regenerate wildlife-rich habitat from scratch. We let vegetation recolonise through natural regeneration. Cattle and ponies were brought in after the land had been fallow for four years, giving the vegetation time to recover. In 20 years, this land has changed into a thriving rewilding site.

What have been the biggest challenges?

Wild grazers in the past would have roamed the landscape, kept on the move by predators and the continuous search for food. Rewilding projects under 400 hectares (1000 acres) could struggle to support several grazing herds all year round. Moving semi-wild grazers on and off rewilding land is a good solution to this problem. The grazing here is of poor nutritional quality, and while the breed and type of herbivore we use is well suited to the ground it's not of sufficient size to sustain the animals year round and so they are periodically moved to land nearby. This requires significant staff time and logistical planning to closely replicate natural herbivory.

The local ecology and health of the animals must also be closely monitored. Grazing for ecological outcomes is costly and rarely generates a profit, although agri-environmental grants help.

What have been the positives so far?

Today Ebernoe is one of the best nature sites in Sussex. Giant veteran oaks laden with wildlife tower over ancient wood pasture, and streams flow through meadows rich in flora, fungi and fauna. Lack of the right woodland management is one of the biggest threats to biodiversity, and by restoring grazing as a natural process to reopen woodland glades we are seeing a diverse range of wildlife flourishing again.

Advice for other landowners

There are several solutions to the challenge of moving animals on and off smaller sites, but you need agreement on where they can go and the skills and expertise to move them. If your neighbouring land has grazing animals, you might offer your neighbour regular, limited access to your land so that you can get the benefits of grazing while your neighbour manages the animals. Perhaps you can encourage a neighbour or two to join forces and expand the size of your rewilding area. There might be an option to create a wildlife corridor that enables your grazers to move to suitable habitat further away.

Managing natural grazing seems like an oxymoron but it's about letting nature do its thing as much as possible while intervening where necessary to mimic natural processes. It's a challenge, but the rich wildlife at Ebernoe Common shows the potential reward for your effort.





CASE STUDY: A TALE OF THREE BLOCKS

KNEPP ESTATE: AT A GLANCE



Location: West Sussex, England



Grazers:

Northern Block: longhorn cattle

Middle Block: longhorn cattle, red deer, fallow deer, Exmoor ponies

Southern Block: longhorn cattle, red deer, fallow deer, Exmoor ponies, Tamworth pigs



Site size:

Northern Block: 235 hectares (580 acres)

Middle Block: 277 hectares (684 acres)

Southern Block: 450 hectares (1111 acres)



Habitat: varied, including wetlands, woodlands, open grasslands, scrub

HOW HERBIVORES SHAPE THE LANDSCAPE IN DIFFERENT WAYS

Rewilding at the Knepp Estate has shown how herbivores shape the landscape in different ways, depending on existing habitat, grazing species and numbers of animals.

The Knepp Estate is arguably the most famous rewilding project in Britain. In this case study we look at the impacts of the grazing animals the project introduced. Most of the Estate's 1416 hectares (3500 acres) are divided into three separate rewilding areas or 'blocks'. The rest of the land is either tenanted or part of the Knepp regenerative farm (which includes a farmer cluster working together). That isn't covered here. The three rewilding blocks are divided by roads and each is separately ring-fenced – a good example of how you can work with existing immovable features on site to develop your rewilding plan. Each block has had different numbers and types of herbivores, which have been introduced at different stages. Comparing and contrasting the Southern and Northern blocks shows how the landscapes have been shaped by different grazing actions.

IN THEIR OWN WORDS

Which grazing animals did you introduce?

In the Northern Block, longhorn cattle (16 cattle with 13 calves) were introduced as soon as the fields were taken out of production.

We introduced cattle and ponies to our Middle Block soon after the fields were taken out of production. Pigs were also briefly introduced, and deer were already present.

We brought longhorn cattle, fallow deer, Tamworth pigs and Exmoor ponies on to fields in the Southern Block between three and seven years after agricultural production stopped. Red deer followed a couple of years later. This meant vegetation could grow relatively unimpeded in the beginning (although there were still some rabbits and roe deer present). This 'vegetation pulse' allowed plants to start recovering from the former arable activity on the land. The Southern Block has a greater variety of large herbivores but there is more herbivore biomass density [the number of large herbivores multiplied by their body weight and divided by the area they have] in the Northern Block.

How did you decide on numbers of animals to introduce?

We developed a livestock units calculator that forms the basis of decisions around animals. It is shaped by rewilding experience over the last 20 years alongside the tweaking of numbers and observations of the impacts of herbivores on vegetation. It is not a perfect system, and we regularly review the number of herbivores and their impacts, and alter their numbers each year, depending on conditions. The numbers are also changed where possible to mimic natural processes and changing environmental conditions. The number of animals is different across the three blocks because of the different vegetation structures and foraging capacities.

What were the differences between the two blocks (e.g. soils, past use)?

The Southern Block had more arable fields than the Northern Block, which had more pasture, and we decided that the Southern Block needed rest, to allow natural vegetation to regenerate and create foraging opportunities before animals were reintroduced; this area had virtually no foraging for herbivores. The Northern Block already had some wooded areas, including mixed deciduous woodland, so could already support grazing animals.

The Middle Block is registered parkland and is part of a culturally important landscape. This means that there are other considerations guiding how the site can be grazed and the habitats that can become established.

Why introduce grazing animals? What was the motivation?

The main aim was to innovate and increase complexity and biodiversity. Without grazing animals the scrub emerging from former agricultural fields would have turned into closed canopy woodland, which is a poor habitat for most wildlife. Disturbance from grazing, browsing, rooting, rubbing and trampling checks galloping scrub. The battle between these two processes – animal disturbance versus vegetation succession – creates all sorts of plant structures, which contribute to a dynamic, ever-shifting mosaic of valuable habitats. Our approach was pioneering and we have learnt many lessons along the way! We continue to gather evidence and test this approach to rewilding. We introduced beavers in 2022.



What preparation did you do?

We restored some habitats, such as native grassland, and seeded wildflowers, to turn the arable land of the Middle Block back into grassland. We installed perimeter fencing to contain our herbivores. Internal fencing was removed to allow the animals to graze over a large area. The fencing was mostly funded by Natural England through Countryside Stewardship schemes.

What have been the biggest challenges?

The Knepp Estate was a rewilding pioneer in Britain. The biggest challenges included learning how to manage the animals within the confines of legislation and getting support from external stakeholders. Rounding up the animals for their checks, testing, the ear tagging of calves, and simply finding them in the scrubby areas are other challenges – they are fantastic at camouflage! Low-stress herding techniques have been tested across the estate to minimise the impact on the animals of the checks we carry out. Lead cows in each herd have a GPS collar, enabling us to track and locate the herds in what is a vast wooded pasture.

The emerging scrub poses another challenge: deer culling is incredibly difficult because the deer can hide very easily, so reducing their numbers and their pressure on vegetation regeneration is not easy.

The team are now working with Natural England and other statutory bodies to enable the animals to move through the blocks, within the bounds of the law. We regularly tweak their numbers and ensure that the hardest animals are bred at the same time as removing unsuitable traits from the herd. The potential impact of TB remains a threat.

What have been the positives so far?

Biodiversity

The Southern Block has attracted much publicity and is celebrated for the way in which biodiversity has flourished. It's a more complex mixed mosaic of open areas, shrubs and trees. Of particular note are the big, tangled bramble mounds that shelter a variety of establishing trees – mostly oaks and sallow but also field maple, ash and wild service trees. It contains lots of open areas that are grassy or have plenty of ragwort and fleabane.



Roaming herds can attract visitors, helping to generate income

Limited grazing and browsing at the start gave trees and shrubs the chance to grow. Now, the cattle, pigs, ponies and deer are helping to create a mix of grassland, scrub and woodland. This has been great for wildlife. We are now a breeding hot spot for critically endangered nightingales and turtle doves. Peregrine falcons, ravens, red kites, sparrowhawks, lesser-spotted woodpeckers, lapwings, skylarks, house sparrows and yellowhammers are all breeding here.

The Estate has the largest population of purple emperor butterflies in the country. It has all five UK species of owl and 13 of the UK's 17 breeding bat species. Visits from the likes of Montagu's harrier, black tern, migrating white storks and even a black stork [in 2016 and 2019; one of the rarest birds in western Europe] are increasing.

In contrast, the Northern Block is still a much more open, grass-dominated landscape, although bramble, hawthorn, blackthorn and dog rose are establishing themselves in some places. The trees and shrubs here didn't get the same opportunity to grow free of the impacts of mouths and hooves. The cows keep it mostly grassy and herbaceous.

This block isn't associated with as many celebrated species, but it's supporting a different community of wildlife – notably invertebrates associated with herbaceous vegetation, dung and litter. The area contributes to the overall habitat mosaic that is so important to wildlife.

Income generation

The key to establishing and maintaining this rich mosaic of habitats is to ensure that there are neither too many nor too few grazing animals. Too many and the land becomes entirely grassland; too few and it reverts to closed-canopy woods. Keeping the populations within these parameters allows us to take animals off the land to process into meat.

We produce 75 tonnes [live weight] of organic, pasture-fed, free-roaming meat every year. We're not using any inputs – no fertilisers or other chemicals and no high-energy feeding systems, farm machinery or routine medication, with the exception of an annual vaccination for black leg called Bravoxin 10 – so our meat production is sustainable, low-cost and very low-carbon. Most is sold wholesale, but a few cattle are butchered and retailed direct through our farm shop, bringing in an astonishing £1500 profit per animal.

This will help to support the rewilding project over the medium and long term, including new jobs. We've invested in an on-site, state-of-the-art butchery. Its turnover is predicted to be between £500,000 and £700,000 within five years.

It's not something we expected but the explosion of biodiversity at the Estate has proved hugely popular with visitors.

We run a range of guided safari tours each year and offer a suite of camping and glamping facilities. These are important income generators. Our nature tourism business – comprising 'wild safaris', camping, glamping and a shop – now has a turnover of around £800,000 per year, with a 22% profit margin (£190,000).

Animal health

Our animals are happy and healthy because they're eating what nature intended them to eat. They have free range of 1416 hectares (3500 acres) of rewilding land, giving them a smorgasbord of organic, herb-rich pasture, as well as bark and leaves to browse on – just as their ancestors would have done.

They have excellent immune systems, unlike animals reared in intensive systems. Their stomachs don't have to cope with food they were never designed to eat so they don't suffer permanent indigestion. The animals are tested for BVD, leptospirosis and liver fluke every year and this is treated as needed in line with animal welfare requirements.

Our longhorn cattle, Tamworth pigs, red and fallow deer run in natural herds of all ages and have free rein to wallow, play, crash through the scrub and generally behave as they would in the wild. Calves and piglets suckle for as long as their mothers will tolerate them. Sometimes that's when they're as big as their mothers!

Budget

There is funding available for capital costs in England through agri-environmental schemes. The Higher Level wood pasture scheme can also provide an annual payout to help fund a project. In the short term, the cost of bringing in animals (native breeds in particular), setting up any extra or different grazing animal infrastructure and hiring a stockman to

manage your herds will be significant. We'd suggest a phased approach – buy a few animals initially and then increase their numbers through breeding.

Once your herds are established, you can look to new enterprises such as meat sales to bring in funds. It may be a couple of years before this is possible, though.

What advice would you give other rewilding landowners regarding grazing and browsing?

We waited nine years before introducing herbivores to our Southern Block to allow vegetation to recover. A break in grazing or giving the land a rest can be very beneficial and should be considered if possible.

Our breeding is bringing out the herd's desirable traits, such as good temperament or suitability to the site's conditions. Calves are selected for breeding to minimise problems. The project has several public footpaths so temperament is important.

We're testing Nofence to see how well it keeps track of the herds and monitoring the impact of visitors on our animals: it's possible that the presence of people could partly reproduce the 'ecology of fear', which would have been central when predators were here. Rewilding projects should consider this within their strategy and ensure that herbivores can move away from public footpaths.

Our livestock calculator covers wild deer populations: it's important to consider existing herbivores and include them in your grazing strategy, as they can have a large impact on vegetation and natural processes.


Find out more: [Knepp Estate](#)





In the wild different herbivores will intermix, and separate herds may follow each other



WICKEN FEN: AT A GLANCE

 **Location:** Norfolk, England

 **Grazers:** 118 konik ponies and 43 Highland cattle

 **Site size:** animals grazing over 368 hectares (909 acres)

 **Habitat:** wetland

SUPPORTING BIODIVERSITY WITH GRAZERS IN A WETLAND SYSTEM

Wicken Fen is one of Europe's most important wetlands and the National Trust's oldest nature reserve. In 1999 the Trust set out its plan to extend the reserve to 5200 hectares (12,850 acres) over 100 years and to restore arable land as fenland habitat. The site is currently 800 hectares (2000 acres) and showcases a rich, recovering landscape of undrained fenland habitat.

IN THEIR OWN WORDS

Why introduce grazing animals to Wicken Fen?

We chose to restore natural processes to enlarge the fen. Traditional management using human labour and machinery would have been less effective and more expensive: requiring roughly one extra person plus equipment for every 40 hectares. Grazing animals, our 'landscape engineers', are a financially sustainable alternative. Their behaviour and foraging habits are restoring the area to a wetland landscape with less human intervention.

Which animals did you introduce?

Konik ponies and Highland cattle, which roam free over large areas. There's no native East Anglian pony so we considered British breeds, but chose hardy koniks from Eastern Europe because they're best suited to the project. We brought in six non-breeders in 2001, another six in 2002, then six breeding animals in 2003 and another seven in 2004. Staggering their introduction meant we could see how they used the land and learn how to handle them. There are now over 100 ponies.

The Highland cattle came from an organic farm on the Isle of Mull in 2005. We started with one bull and eight cows. We wanted animals that were used to extensive grazing over a large area and needed minimum handling.

What preparation did you do?

Much of the fencing and ditching we needed was already there. We battered the edges of the steep-sided drainage ditches to give easier access to the water and prevent animals getting stuck. Other costs included blocking field

drains, putting in sluices, erecting fencing and buying mobile animal-handling equipment, such as race gates and hurdles.

How much did the animals cost?

The breeding herd of 13 koniks cost between £8,000 and £10,000, including vet and admin fees and delivery. Three more breeding stallions were imported a few years ago to increase genetic diversity, at a total cost of £3,500. We spent £78.28 on each of our 156 animals in 2019, primarily on vet costs. We check our animals daily and carry out body condition score checks monthly. We don't give supplementary food because the animals would then linger in certain places and might try to establish feeding hierarchies. We also want to avoid any familiarity with humans who provide food.

What have been the biggest challenges?

The 43km of fencing is expensive and challenging to maintain, as is stitching together the different areas of the reserve so animals can roam freely. We're as hands-off as possible with the animals but if one needs veterinary attention we ensure it gets it. Sometimes visitors are reluctant to accept that the ponies and cattle are semi-feral and try to groom or feed them. Others say they're not being looked after. Vets used to working with domestic animals sometimes suggest solutions that aren't practical for semi-wild animals.

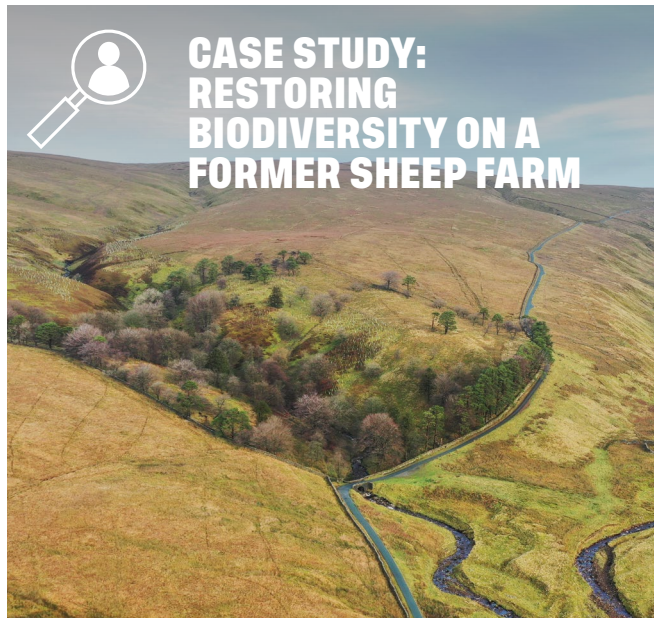
What have been the positives so far?

The diversity and variety of plant species is now far greater in grazed than ungrazed areas at Wicken Fen. The animals have created a mosaic of habitats and reduced the need for management of the site. Animals in breeding herds express much of their natural behaviour. Different ages and sexes have specific nutritional needs depending on the time of year, which influences what and where they eat and adds another layer of diversity.

Advice for other landowners?


Install the infrastructure before the animals arrive and be ready to learn constantly! Some things will go wrong but when they do the key is to learn, adjust if necessary, and carry on.

Find out more: [National Trust: Wicken Fen](#)





CASE STUDY: RESTORING BIODIVERSITY ON A FORMER SHEEP FARM

KINGSDALE HEAD: AT A GLANCE

 **Location:** North Yorkshire, England

 **Grazers:** 18 Riggitt Galloway cattle

 **Site size:** 608 hectares (1503 acres)

 **Habitat:** bog, grassland, wet and dry heathlands, woodland

MANAGED GRAZING TO CREATE THE CONDITIONS THAT SUPPORT NEW SPECIES

Previously a sheep farm, Kingsdale Head in the Yorkshire Dales is now a pioneer in wildlife conservation and recovery, and carbon storage. The 608-hectare (1503-acre) upland site is a mix of woodland, peatland, moorland, grassland, gills and streams.

IN THEIR OWN WORDS

Pressures on the land

Before we took on the farm, like much of the Yorkshire Dales, the peatlands had been heavily drained and there was a long history of sheep grazing both of which had a significant impact on wildlife.

The sheep ate selectively, cropping the sward close to the ground, and eating new buds and growth of regenerating trees. This prevented the regeneration of trees and dwarf shrubs and allowed coarser or less palatable species to take over. At the same time, the drainage dried the peat, speeding up erosion, decomposition and the release of carbon.

An archaeological report in 2005 revealed the site's potential. Pollen records and mesolithic firepit remains suggested that parts of the site had once been wooded, with a variety of scrubby tree species found pointing towards a wooded but also scrubby and open landscape influenced by herbivores and humans. Petrified wood found lower in the valley with beaver teeth marks highlighted the potential for returning wildlife.

Regeneration begins

The previous owner had entered a Higher Level Stewardship scheme in 2011, which involved reducing sheep grazing pressure and the creation of new woodland. Since the farm changed hands in 2020, it has been geared towards maximising biodiversity, particularly a range of native species.

A total of 16 hectares (40 acres) of trees had been planted using English Woodland Grant Schemes, supplementing the 13 hectares (32 acres) of mature woodland already on the farm. These woodland creation schemes, now over 12 years old, created fenced enclosures and demonstrated that

vegetation change is possible with reduced grazing pressure. Heathland is also recovering well in these areas, with large numbers of green hairstreak butterfly, billberry bumblebee and woodland birds making use of recovering vegetation and establishing trees. Our 450 hectares (1112 acres) of peatland are also being restored. More than 5000 dams have already been created in the channels previously cut into the peat. With a reduction in grazing pressure and the careful introduction of trees and scrub, an area of at least 100 hectares (247 acres) of river, steep-sided slopes, acid and calcareous grassland is developing into a diverse range of habitats.

The role of grazing

We still see grazing as an important part of the management of Kingsdale Head and are using it in a way that enhances nature rather than diminishes it.

Previous management as a sheep farm had put pressure on the site and grazing-tolerant species and habitats survived, and then dominated.

We've now replaced the sheep with a small herd of grazing cattle (native breed Galloways), which are less selective in the vegetation they eat. They maintain some open areas of grassland, removing vegetation as they eat, and, rather than selectively grazing the best of the sward as the sheep did, they tear at clumps of vegetation, resulting in more varied swards and opportunities for different species. The holes they punch in the ground with their hooves create space for new species to arrive, and the dung they produce is a nutrient-rich resource that aids the recovery of wildlife. The cattle even carry species with them, in their guts and hair and on their hooves, which they can distribute around the site as they graze.

The challenge for us is to manage the amount and timing of grazing to harness these biodiversity benefits and minimise damage to sensitive habitats such as blanket bog and deep peats.

Managing cattle using Nofence collars

We've done this by using Nofence collars that allow us to use GPS to track the cattle and set seasonal grazing areas. This way we can monitor grazing behaviour and better understand how the animals use the site.

The Yorkshire Peat Partnership, as part of peat survey work, and South Lakes Ecology, who undertook a wide range of baseline surveys, mapped existing habitats for us, enabling us to develop a grazing plan including appropriate stocking density in our first year. We've used data from the Nofence collars to test the success of the plan and to alter grazing density as needed.

“AS A RESULT OF SIGNIFICANTLY REDUCED AND DIFFERENT GRAZING, WE ARE ALREADY SEEING A CHANGE IN VEGETATION, WITH MORE COMPLEXITY EMERGING ACROSS THE SITE.”

The cattle are rotated around large areas of the site throughout the year to manage grazing pressure on more sensitive parts. Their grazing anatomy means they are less selective than sheep about what species they graze within an area, but as a result of this and their size, cattle move extensively within the landscape and can be more selective about what habitats they preferentially graze.

Analysis of the collar data suggests cattle tend to avoid steeper slopes, blanket bog and heath, preferentially grazing better and more nutritious vegetation including neutral and acid grassland areas along rivers and gills.

Our cattle are generally choosing not to graze the blanket bog and instead are going elsewhere for richer pickings, allowing the peatland, scrub and heath to recover while maintaining, through grazing, open areas and grassland up the river channel and in species-rich fields.

The collars have the potential to restrict areas of grazing for the cattle via virtual fencing and this has worked well during winter months when grazing is restricted to the river valley. Outside of the restricted grazing period the grazing plan is mainly managed using existing drystone walls and relying on the cattle's natural behaviour and preference to move to areas they know offer the best grazing across the site. As a result the collars are now mainly used as a monitoring tool, meaning that not all the cattle are required to wear one. The group's natural behaviour is to move as a herd. We deal with occasional broken or lost collars so that we can be confident that the Nofence data accurately represents grazing density across the farm.

We don't just rely on Nofence collars, though, and still closely monitor the behaviour and health of our cattle, and the vegetation they're choosing to eat and when they're eating it.

A nature-rich future

We're certain that our cattle are part of the complexity and ecology of the site. They will help tree and dwarf shrub species germinate and thrive here and ensure that our wildlife will become far more diverse. As a result of significantly reduced and different grazing, we are already seeing a change in vegetation, with more complexity emerging across the site so that different habitats are becoming much more distinct. Some natural tree regeneration is emerging and there are also more invertebrates as well as bird species making use of the changing vegetation diversity and structure.

Find out more: [Kingsdale Head](#)



Reduced grazing can bring complexity, allowing species to thrive and trees to naturally regenerate



CASE STUDY: REVIVING THE WILD HEART OF SOUTHERN SCOTLAND

CARRIFRAN: AT A GLANCE



Location: Dumfries and Galloway, Scotland



Grazers: 0 (removal of sheep and fencing to protect from deer)



Site size: 655 hectares (1620 acres)



Habitat: native woodland, montane scrub, grassland, wet and dry alpine and sub-alpine heathlands, blanket bog, tall herb and acid scree

EXCLUDING GRAZING TO ALLOW TREES AND SHRUBS TO THRIVE

Carrifran is a 655-hectare (1620-acre) ice-carved valley in the Moffat Hills in Scotland. Over the last few decades Borders Forest Trust has worked with local people and communities to establish a wooded landscape there with a rich diversity of native species. Carrifran is one of four Borders Forest Trust sites covering 3250 ha of land in the Southern Upland hills of Scotland where native woodlands and associated natural habitats are being restored. These sites collectively form the 'Reviving the Wild Heart of Southern Scotland' landscape scale ecological restoration initiative run by BFT.

Carrifran valley was bought as a result of the hard work of a dedicated team of volunteers backed by many generous supporters. The project is overseen by the volunteer-led Wildwood Steering Group. Day-to-day management is led by the Trust's Site Operations Team.

IN THEIR OWN WORDS

The Trust and our wider project team here have been working since 2000 to create the native woodland through a mixture of planting and natural regeneration. We didn't have a local seed source for native trees and so volunteers and specialist contractors planted trees to kick-start the natural woodland processes we wanted.

Excluding grazing sheep and goats

The land had been heavily grazed by sheep for a long time so our priority was to remove grazing pressures and allow vegetation to recover. We did this by planting in compartmentalised stages over six years, in collaboration with a local farmer who grazed the land up until planting.

We had to carefully shepherd the sheep that remained to keep them out of newly planted areas, where they could have caused significant damage, and as the planting was completed livestock was removed from the valley. We now have heavy-duty, six-wire fencing to keep out sheep and feral goats from neighbouring properties.

The valley's feral goats would also damage the trees given the chance, so after talks with supportive ecologists the goats hefted to the valley were removed and those on adjacent

properties were fenced out. We installed stiles on fences so that walkers could continue to enjoy the site.

Occasional discussions are had by the steering group about whether grazing with cattle or pigs would assist with regeneration but the woodland is still young and is already showing good signs of regeneration, so this type of intervention is not considered necessary at this stage.

Managing deer

Excluding deer was also essential to give plants the chance to grow and spread. In Scotland there are now thought to be more than a million deer – almost the number that would have roamed 10,000 years ago, when there were large predators, far more woodland cover and little habitat fragmentation compared to today.

Too many deer, not forced by predators to keep moving, affect woodlands in many ways: their grazing prevents the natural regeneration of trees from seeds and tree regrowth from coppice; they can change the structure and species of woodlands by eating the understorey and leaving less palatable vegetation; their trampling and compaction can cause soil damage; and their browsing can strip tree bark, killing even large, mature trees. Excess deer can have a severe impact on other animals, too, such as small rodents and woodland birds. Overgrazing limits the plant food available, and therefore the insects that depend on those plants and the animals that eat those insects. Water quality is also negatively impacted by the presence of deer.

We are fortunate at Carrifran to only have roe deer and not red deer, which exist in large herds up north. However, as the woodland has established, non-native sika have moved in, presenting further risks to trees and natural regeneration.

Fencing out deer is not 100% reliable, is costly and hard to maintain in exposed, high-elevation sites so the population at Carrifran is controlled by culling. BFT would rather not cull any animal, especially native species. However, in the absence of natural predators it is required in order to manage deer numbers, which would otherwise prevent tree establishment. As a result of management, the current deer density at Carrifran ranges between two and four deer/km² which is allowing trees to thrive and natural regeneration to flourish.



Only the most humane methods are used and some carcasses that are hard to remove are left for scavengers including golden eagles, which have recently been released to the area.

“THE AREA IS BEING RESTORED TO A FUNCTIONING NATURAL ECOSYSTEM; THE MANAGEMENT REQUIREMENTS ARE NOW DIMINISHING.”

A very different site

The valley is already visibly very different with closed canopy woodland now thriving in the valley floor. More than 750,000 native trees, all of local provenance, have been planted and with almost no grazing they are thriving. Tall herbs and plants that grow in river gravel are flourishing and the heather and alpine plants of the heaths are coming back to life. The range of habitats we now have has really benefitted fern, moss, lichen and fungi species.



The project has become an educational resource for both interest groups and children



By removing grazing pressures and restoring the seed source at Carrifran, an abundance of species and habitats are now thriving

Other wildlife is returning, too, notably our birds. Willow warblers, chaffinches, blackcaps, long-tailed tits, siskins, lesser redpolls and tree pipits are all regular sightings, and foxes and badgers are now common. We also see otters, stoats, weasels, kestrels, peregrines and ravens, all taking advantage of the restored landscape.

Looking ahead

As the trees in the woodland are showing good signs of natural regeneration we are looking at diversifying the flora of the woodland floor and bringing back lost heathland species such as bearberry. We've already restored an area of montane scrub, which is mountain woodland high on the tops, and this is now flourishing and producing its own seed. This is one of the rarest habitats in the UK and has been virtually eliminated from southern Scotland by centuries of grazing.





We're expanding our restoration and rewilding education programmes and particularly trying to engage local children, and we host site visits to a considerable range of interest groups. And by linking up with other restoration projects in the region our impact can only increase. As regeneration of the site is gaining momentum, the area is being restored to a functioning natural ecosystem and the management requirements are now diminishing.

Find out more: [Borders Forest Trust: Carrifran Wildwood](#)



CASE STUDY: RENT A PIG (AND OTHER GRAZERS)

SHARPHAM ESTATE: AT A GLANCE

-  **Location:** Devon, England
-  **Grazers:** two mangalitzta pigs (seasonally)
-  **Site size:** 20 hectares initially (50 acres)
-  **Habitat:** scrub, woodland

RENTING GRAZING ANIMALS FOR FLEXIBILITY

Introducing grazing to smaller landholdings is tricky. The smaller the area, the greater the need to regularly move grazing animals to prevent overgrazing and the suppression of natural processes. In addition, installing infrastructure such as welfare facilities and perimeter fencing can be difficult and costly.

At Home Farm on the Sharpham Estate in Devon, Ambios, an organisation that trains people in practical conservation, is taking a rewilding approach to managing a newly acquired site of 20 hectares (50 acres), which will eventually be linked to a 32-hectare (80-acre) area that Ambios has been managing for wildlife for seven years.

IN THEIR OWN WORDS

Before we became involved the Sharpham site had been heavily grazed and trampled by dairy cows, leaving a very compacted sward, and much of it had been heavily fertilised. On a visit to the Knepp Estate, we saw how pigs were breaking up compacted ground, but we don't want grazers at Sharpham permanently. Our focus is our trainees – the next generation of wildlife professionals.

Rather than introduce new species to the site we're concentrating on what's there already and what could return naturally. We'd rather introduce herbivores for limited periods to do specific jobs. That might be pigs for disrupting, water buffalo for wetlands, or letting ponies do their thing.

Just one Tamworth pig at the Knepp Estate is ploughing up to 16 hectares (40 acres) in a year so we knew we didn't need many animals, and, instead of buying our own, hired two curly coated mangalitzta pigs for six weeks from Rewilding Futures, a regenerative agriculture project nearby. The pigs cost us £1500, which included advice on where they'd be most effective, welfare checks, and shelter, fencing and water provision. We have electric fencing with two low wires to keep the pigs in. They can sense the current and so steer clear, which makes their management much easier. We keep the fence line clear of vegetation.

The pigs came initially to graze a 1.6-hectare (4-acre) enclosure, although in the first year the lack of spring rain

made it difficult for them to churn the ground and in the end they didn't manage to plough as much as we'd hoped – only about 10% of the area. Despite that, they began to create wallows and nests. Within 16 months there were signs that nature was springing back into life.

They returned that autumn to rootle in our woodland, where they could seed acorns through their dung. That meant removing fencing, though, which wasn't straightforward because the site has public access. We worked with stakeholders including the Sharpham Trust to make sure there were no problems.

The pigs were an experiment that turned out very well and now visit twice a year. They give us an opportunity to engage people in the project, especially adults with learning difficulties, who visit with a local charity. People love woolly pigs. We saw a huge increase in social media engagement when we first shared pictures of the pigs.

We're a science-based organisation and are in it for the long haul. Our trainees are monitoring what's happening over 12-week periods so we have the people power to really learn from everything we're doing.

Plant life is rejuvenating because of the way the pigs have disrupted the seed bank, and we're hoping that this increases the range of invertebrates on the site. We're using pitfall trapping to monitor this. What happens further up the food chain will also be interesting – will we have more birds and more diverse birdlife, for example?

We also want to give cattle free rein across a large area and install cattle rights of way so that they can cross public paths safely. Members of the public will pass through gates to cross the cattle paths. Managing the pigs is more complex but doable. We'll probably keep them in a field rather than a field system.

We're using pigs and other grazers for ecological regeneration rather than food production. If you're not farming for food and don't need to make an income from your animals, there are all sorts of possibilities. For us, wildlife is the priority.

Our work at Sharpham has just begun. It may be a small site but it's one to watch.

Find out more: [Ambios](#)



CASE STUDY: BOOSTING THE BEAVER: THREE STORIES

THREE BEAVER PROJECTS: AT A GLANCE



Location:

Bamff Wildland (BW) – Perthshire, Scotland
Derbyshire Wildlife Trust (DWT) – Derbyshire, England
Wild Ken Hill (WKH) – Norfolk, England



Number of beavers:

BW three families established population
DWT two families (up to eight planned)
WKH four introduced



Beaver site size:

BW 182 hectares (450 acres)
DWT 47 hectares (116 acres)
WKH 22 hectares (55 acres)



Habitat:

mix of wetlands, woodlands and grasslands

THE PLANS, PREPARATIONS AND OUTCOMES OF THREE DIFFERENT BEAVER PROJECTS IN SCOTLAND AND ENGLAND

Beavers boost biodiversity, help reduce flood risk and are a source of wonder and joy for many. They're also a native species to Britain that should, quite simply, be here. You might want beavers on your land for one of these reasons or all of them. Whatever your motivation, you need to be ready for a lot of planning, form-filling and ground preparation before you can let loose the beaver's incredible eco-engineering skills.

We talk to three landowners about their experience of bringing back beavers. Bamff Wildland in Scotland blazed the trail in 2002 when it introduced two sister beavers to an enclosure. Two male beavers joined them in 2004 and helped establish the site's current population. Derbyshire Wildlife Trust introduced two families of beavers to their Willington Wetlands Nature Reserve in 2021. Wild Ken Hill brought two female and two male beavers to Norfolk in 2020.

Most beavers now being reintroduced to England and Wales are from the wild population in Tayside in Scotland.

IN THEIR OWN WORDS

Interviews with Louise Ramsay (Bamff Wildland), Kate Lemon (Derbyshire Wildlife Trust), Dominic Buscall (Wild Ken Hill).

Why introduce beavers?

Bamff Wildland (BW): To restore wetland on our land, and to support the aim of Scottish Natural Heritage to bring the beaver back to Scotland.

Derbyshire Wildlife Trust (DWT): We hope they'll show the benefits of nature-based solutions, including natural flood prevention. We believe the beaver will alter the hydrology of our site. Slowing flood waters from the Trent at Egginton Brook and holding the water for longer will help reduce flooding at Willington, Egginton and Burton-on-Trent.

We believe the beavers' arrival will benefit all of the reserve. They'll create more complex habitat and areas of shallow water. They'll help to limit the growth of willow, which we cannot do by hand, and will hopefully coppice our reed beds, which are difficult to cut manually because they're in deep

water. We don't have enough reed bed for the bitterns that come to the site. The beaver should help the reed bed to spread.

Finally, we hope there will be good socio-economic benefits. The project should put Willington on the map, benefitting local businesses and generating new opportunities. People have already been asking us about walking tours.

Wild Ken Hill (WKH): We're hoping our project will bring benefits much like those reported from the oldest beaver trial in England, along the River Otter. We hope these benefits will help make the case for more beaver reintroductions. Certainly the floods of winter 2020/21 showed how much we need beavers back in our landscapes.

What was the reintroduction process? What preparation did you do?

BW: Our first beavers were two Norwegian animals surplus to the Kent Wildlife Trust project at Ham Fen. Two Polish beavers from English zoos followed, then two came from Bavaria via Gerhard Schwab and Derek Gow. Licensing was not required in 2002 but we had to fence them in.

DWT: It's a complicated process to get beavers. There are stringent licensing and permit requirements, which demand a lot of detail on how the beavers will be enclosed and managed. We worked with Derek Gow and double-checked with him on the suitability of our land and how many beavers we should bring in. We went through a number of iterations of beaver plans with different fencing options, revising the fence line because of challenges in different areas.

WKH: We enlisted expert help from Professor Richard Brazier, Dr Alan Puttock, Derek Gow and Roisin Campbell-Palmer for our application to release beavers. We had to demonstrate that the site was a perfect habitat for beavers, that their impact would be positive and that there was support for the reintroduction from local interests.

Three months after submission we received a licence to release up to 15 beavers (three family units of five) into a 55-acre enclosure. We had to build a tall perimeter fence that drops below the surface, and fix metal grills on all exit and entry points into the enclosure.



We've put wire mesh on the base of all special veteran trees, so they don't turn into beaver breakfast. We want the beavers to bring biodiversity benefits but we also want to look after the biodiversity we already have.



Beavers can have significant ecological benefits through their creation and management of wetlands

What have been the biggest challenges?

BW: Opposition of farmers in the low ground of Tayside and the assumption that we were the original and only source of the Tay beavers. We were neither the only nor the first.

SNH's decision to trap and remove all the wild beavers in Tayside was a challenge. This was not a direct problem for us, as our beavers were still enclosed at that time, but we opposed it on principle.

SNH wanted us to have zoo-style fences and to carry out very onerous procedures (trapping, tagging, weighing, testing). We resisted because by that time there were beavers all over Tayside, and after three very wet winters they were able to get in and out of our enclosures. At that point, the Bamff beavers were part of the wild population and were being tolerated and monitored.

DWT: We've had to look carefully at the culverts and water gates. Where beavers have escaped in other locations these have been their means of escape. Every ditch and stream needs its own gate and culvert, which requires a lot of engineering. The first design of one of the culvert boxes was

absolutely massive. It had to be rethought because it was breaching a 10-tonnes weight limit on a bridge.

Working with neighbours can be tricky but is important. One relationship turned sour when the person realised the project wouldn't benefit them financially. They wanted a large sum in annual rent. Another accused us of doing things that would flood their land. In the end, we had to say "Let's see what happens with the beavers."

Our local angling club was concerned, not about the beavers but about the possibility of increased visitor numbers that would put more pressure on their access track. Some people were critical on social media. That takes its toll on staff and impacts mental health and morale, and should be taken into account.

WKH: At the beginning of the project we were hoping to reintroduce two pairs into two separate territories. Lockdown in March 2020 curtailed the trapping season so we were only able to release two females, which subsequently spent six months living alone. This is quite unusual for beavers and we were glad to finally release two males to join them.

There was also a moment when one of the beaver pairs appeared to fall out, and the male in particular looked distressed and unwell for a period of time. Fortunately, they seem to have settled down now.

What have been the positives so far?

BW: Beavers are evolving the wetlands at Bamff and have enriched the habitat, attracting a greater abundance and variety of insect species than in neighbouring locations where beavers are absent, often by a factor of three to four. This has benefitted insectivorous birds and mammals. Swallows, flycatchers and bats have been spotted in greater numbers feeding at beaver sites, and rarely or not at all at non-beaver sites nearby.

The beavers have radically transformed waterways by damming agricultural drainage ditches and creating dozens of pools that teem with life and hold the water table steady through flood and drought. They constructed a huge 60-metre dam, possibly the longest in the UK.

The huge beaver pond behind the dam is far more effective at holding and slowing water than the long drainage ditch that existed previously. Without it, and various other dams the beavers have built, water would tumble ferociously through the estate and cause further problems to nearby residents who regularly experience devastating flooding.

The beavers have given us the opportunity to offer more wildlife-watching and tourism activities to help generate revenue.

DWT: It has started a conversation on floodwater management, natural processes and how beavers can work for us. The project has been popular with Trust members and the public. The beaver appeal we ran generated 1000 new members. Interest is huge. This has helped raise our profile massively.

The reintroduction has also helped our partnerships and collaborations. We already had good partnerships but we've been having more conversations, and more detailed conversations, with more organisations. It's been like a new conversation where we're starting afresh, giving people the opportunity to change their opinion of us. It's been nice to redefine who we are and what we do.

WKH: One exciting aspect of the release was the huge wave of public support we received on announcing its success. Write-ups in the press, engagement with our social media channels and even long emails of support reaffirmed our belief that people absolutely want this animal back in England.

Deploying 10 camera traps in the enclosure since the release has enabled us to get a decent understanding of beaver behaviour. One has found a large pond where she seems to be very comfortable feeding on the sycamore; the other has plugged some old culverts to create a long, linear wetland system.

It's too soon to judge the impact that these animals will have on this landscape, but the early signs are positive. There is more water than there has been historically in parts of the site, and camera trap footage has shown interesting species using the area: we have seen goshawks bathing in the ponds and an otter spent over a week in the area for the first time in decades.

What other grazing or browsing is happening on site?

BW: We had wild boar in the same enclosure as the beavers from 2005 but no longer have them. We are planning to introduce native breeds of ponies and pigs and return a small number of shorthorn cattle to the Wildland.

DWT: We'll have longhorn cattle grazing in with the beavers.

WKH: Red poll cattle, Exmoor ponies and Tamworth pigs are grazing in our 1000-acre rewilding area outside the beaver enclosure.

What was the lead time to getting the beavers?

BW: About two years.

DWT: We looked at this for 18 months to two years before we had something we were happy with to take to funders. It can easily take two to three years to prepare and get everything ready.

WKH: About six months from the point of application. Three months to have the application reviewed, one month to build the enclosure and two months of trapping. Overall it felt quite fast.

What was your budget?

BW: The cost of hiring a van and driving to Kent plus the cost of fences round a few acres.

DWT: Our budget has grown. We've learnt that we need different types of culverts and fencing. In some places we need 6ft-high fencing and overhanging skirts so that the beavers can't breach the tops when water levels rise during flooding. We've had to secure new funding several times.

WKH: In total, £30,000, most of which was spent on the enclosure.

What advice do you have for other landowners?

BW: If you have suitable land and want to help with the climate and biodiversity crises, don't hesitate to introduce beavers if you get the chance. They are utterly fascinating and delightful. Mitigation of small-scale impacts (for example, cutting of special trees or local flooding) can be easily done.

Lobby hard, or support the efforts of others, to get the government to pay for beaver habitat as a public good. Once this comes on stream you may feel ready to let go of some riparian land for this purpose, even if you are currently farming it for arable crops.

Pulling farming back from the riparian edge will reduce the chance of beavers flooding the farmland and make your land more interesting and beautiful. It will also bring many benefits to the wider world, especially to your downstream neighbours by mitigating flooding. This is especially true if the river is allowed to braid and meander again. It may even provide your farm with habitat for pollinators, which may be needed on yours or your neighbour's farm.

DWT: Do your homework, take your time and be in it for the long haul. Beavers are great and have a fantastic role to play as ecosystem engineers but do start conversations with

Natural England and the Environment Agency early on to understand the limitations on their release and the licensing requirements. Talk to as many people who have beavers as possible, to learn from their experiences. Persevere with the paperwork. Get in touch with Derek Gow – he is a fantastic source of advice and knowledge.

WKH: I hope and expect that it will be legal to release beavers into the wild in large parts of England sometime in the next 12 months. Land managers interested in bringing beavers back into their catchments may wish to wait until wild release is possible to avoid the cost of building an enclosure.

Find out more:

[Bamff Wildland](#)

[Derbyshire Wildlife Trust](#)

[Wild Ken Hill](#)

BEAVERS: A SUMMARY OF WHAT YOU NEED TO REALISE YOUR BEAVER AMBITIONS

Water source: It doesn't need to be deep but you do need some kind of water source. At the Forest of Dean there was only a shallow stream. Extra ponds were created by the beaver release.

Foraging opportunities: Woodland (ideally willow and alder) and other riparian vegetation, including non-native morsels such as Himalayan balsam. Beavers will move up to 50 metres to forage if there's good cover.

Natural regeneration: If you don't have many trees you might need to wait for natural regeneration before introducing beavers. Beavers coppice woodland so they'll help with regeneration if there are trees there.

Finance: The main cost of beavers is the fencing needed to keep them in. Fences have to be dug in and must slope at the top. Every site is different. At the Forest of Dean the fencing had to be boar-proof. Despite spending £45,000 on fencing, the first beavers at the Knepp Estate escaped into the wider catchment. You may need wire mesh on the base of special veteran trees to protect them.

Permission: In England you need an official licence from Natural England. Natural Resources Wales issues licences for beavers in Wales. NatureScot is responsible for all beaver activity in Scotland. You'll have to demonstrate that your site is a perfect habitat for beavers, that their impact will be positive and that there is strong local support for the introduction. Applications take roughly three months to process once submitted.

Expert advice: You'll need to find someone to help identify the best place to introduce beavers on your land and to help put together the licence application. Most landowners are working with beaver expert Derek Gow and Roisin Campbell-Palmer from the Royal Zoological Society Scotland on the process.

Patience and passion: Reintroductions take time and effort. You'll need to have detailed plans, the necessary infrastructure, conversations with neighbours and other partners or stakeholders. It helps if you're a keen beaver believer.

APPENDIX 1. FENCING SPECIFICATIONS

SPECIES	FENCING SPECIFICATIONS	COST	SUITABILITY FOR VIRTUAL FENCING	LICENCE REQUIRED	DISADVANTAGES
Pig	Steel stock fencing (be aware that pigs can be escape artists and digging and reinforcement may be needed if individuals show an inclination for this)	££	✗	✗	Steel stock fencing can prevent the movement of small mammals. Consider if and how gates might be included to accommodate movement of wildlife
Cattle	Standard agricultural fencing, e.g. post and rail	£	✓	✗	
Horse	Standard agricultural fencing, e.g. post and rail (more fencing may be needed if you have individuals that show an inclination to wander)	£	✗	✗	
European bison	Double fencing – an electric inner fence at 1.4m tall, an outer fence at 1.9m tall	£££	✗	✓	Such extensive fencing requires significant groundworks, and will have a visual impact on the landscape. Many sites will need permission for such work
Beaver	Steel mesh fencing should be dug into the ground to prevent burrowing, and should be at least 1.2m tall (higher if flood waters are likely to reach above the fencing)	£££	✗	✓	Beaver fencing can prevent the movement of other mammals. Consider if and how gates might be included to accommodate movement of other wildlife

Cost key

£ = less than £10 per metre ££ = £11–20 per metre £££ = £21+ per metre

Wild boar are not included in this table as their release is not permitted on rewilding projects at the time of publication. Elk are not included because at the time of publication there is no example of the fencing requirements in Britain. Deer are not included because most rewilding projects do not fence in deer on rewilding land. Fencing specifications for keeping deer out are provided with the relevant land management subsidy for each devolved nation.

APPENDIX 2

GLOSSARY

Browsing: The consumption of leaves, soft shoots and fruits, usually of trees and woody species, by herbivores.

Conservation grazing: A grazing regime that seeks to maintain or improve a specific habitat. The species and number of animals is determined by the goal for the site.

Grazing: The consumption of grasses and herbs by herbivores.

Herbivory: The consumption of plant material by animals. Herbivores are animals adapted to eat plants.

Livestock: Domesticated animals that are kept for agriculture. Under current UK law, many of the large herbivores used as proxies for wild animals in rewilding are classified as livestock even if managed as semi-wild or feral animals.

Natural grazing: A grazing regime that seeks to restore the natural ecosystem process of herbivory. The species and number of animals is determined by ecological conditions and the natural capacity (and fluctuations in capacity) of habitats.

Natural succession: The sequence of ecological changes in which one group of plant or animal species is replaced by another as part of the natural lifecycle of a landscape.

Sward: An area covered with grassy turf.

Vegetation pulse: The flush of new growth that occurs when activities that have suppressed vegetation growth in an area are stopped. A vegetation pulse may last multiple years as the vegetation recovers.

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WHO'S BEHIND THIS GUIDE

This guide is one of a series of publications produced by Rewilding Britain that provides practical guidance to rewilders. The guides are designed to help rewilders across Britain overcome common barriers in rewilding, as identified through conversations with members of the Rewilding Network.

The Rewilding Network connects a movement of rewilding projects across England, Scotland and Wales. Supported by Rewilding Britain, the Network helps rewilders connect and share experiences, ideas and expertise.

rewildingbritain.org.uk/rewilding-network

