



Bioresilience on Magdalen Farm

A framework for agroecology and habitat creation

Contents

Foreword	page 2
Key principles	page 2
Two approaches in tandem	page 3
The impacts on our visitors, and on food production	page 4
Agroecology in the 'home farm'	page 5
Rewilding in the 'wider farm'	page 7
🌿 Natural succession and natural disturbance	page 8
🌿 Grazing zones	page 9
🌿 Wetlands and the River Axe	page 11
🌿 Timetable	page 12
🌿 Costings	page 15
Annexes - Impact assessment and advice and case studies	page 16

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In the last 50 years, Britain has lost ...

50% of its wild animals

Foreword

We are so used to being told we live in a time of emergency, the words lose their meaning.





Obscured from our consciousness by climate change and economic hardship is a crisis which we have all become alarmingly immune to - the incremental extermination of our wildlife.

As a conservationist landowner, the Magdalen Environmental Trust is adopting a new land management strategy on its 132 acres at Magdalen Farm. The aim is to let wildlife bounce back, provide a safe haven from which wildlife can spread into the surrounding landscape, and to enhance the charity's other core functions of environmental education and care farming.

This land management framework has been shaped by an 18-month period of consultation and advice. It sets out the overall strategic direction, the initial actions we will take, and the criteria for decision making in the years ahead – decision making in response to what nature does.

Key principles

Our strategy requires that any future land use on Magdalen Farm contributes to one or more of the following:

-  Enhance the charity's education and Care farming programmes
-  Provide or enhance habitat(s) for wildlife
-  Protect and enrich the soil
-  Enable livestock to express more natural behaviour

In the last 50 years, Britain has lost ...

55% of its farmland birds

(that's 50 million birds)

Two approaches in tandem

Over the last decade Magdalen Farm has been considered in two distinct parts. These two parts need different treatments due to their distinct relationships with our customers, but they will be unified by the key principles above:

1. The 'home farm' surrounding our buildings, in which we carry out 42% of our charitable activities, and in which we keep livestock and grow fruit and vegetables.
2. The wider farm, in which we carry out 58% of our charitable activities, most of which has been leased to a tenant farmer, and which consists of open pasture, hedges, tree plantations, old woodland, the river Axe and wildlife-rich slopes in our SNCI (site of nature conservation interest).

The home farm will be enhanced for wildlife through the application of agroecological principles that do not decrease food production, and which maintain their value for education and care farming. This is a relatively intensive management regime, requiring more resources per acre.

The wider farm will be 'rewilded', following techniques used successfully elsewhere. It will continue to be grazed with livestock, but at lower stocking densities, facilitating the development of new and more complex habitats. This is a very low-intensity conservation management regime, appropriate for larger areas.

Combined together, with the habitat-enhanced home farm at its centre, we hope to create the conditions for an explosion of wildlife.

In the last 50 years, Britain has lost ...

33% of its moths

The impact on our visitors

This framework concerns itself with land management and does not directly relate to the charity's core work with our customers. Nor does this framework speculate as to whether our customer base will change.

However, the framework does hold as a Key Principle that visitors' educational or care farming experiences should only be enhanced by increased biodiversity. There should only be positive effects, not detrimental ones.

Importance for environmental education & care farming

	At present	In future
'Home farm'	42% of all our provision	42% of all our provision
The wider farm	24% of all our provision	24–35 % of all our provision
The woods	34%	23-34% of all our provision

The impact on food production

The home farm will continue to produce a range of organic fruit and vegetables, eggs, chicken and pork at current levels – approximately 3.3 tonnes per year.

Beef will still be produced from the wider farm, but in accordance with the widely held view that our society needs to consume less red meat for health and environmental reasons, the volume of beef produced will be reduced.

The coronavirus epidemic & Brexit have shown us that, despite widespread fears, Britain's food supply is remarkably robust. In 2020, even when a pandemic ravaged the world, our country's ability to grow and import food was largely unaffected. The shop shelves were restocked quickly after the initial panic-buying.

Agroecology in the home farm - an incremental approach

What is agroecology?

It is the application of ecological principles to agricultural systems and practices.

The term describes means of growing food in ways sympathetic with nature. It is promoted by the Soil Association, (of which we are a member), and the Food, Farming and Countryside Commission. It is sustainable food production with the needs of wildlife and the environment considered not just where they help organic growing, but as being priorities in their own right.

Think of it as Organics+



In the last 50 years, Britain has lost ...

30-60% of its insect habitat

The 7 acres of the 'home' farm are already developed for hands-on and accessible learning alongside food production, and already support a variety of wildlife in hedges, copses and streams.

Sweeping change would be neither appropriate nor desirable in the home farm, but we accept that agroecological improvements can, and therefore should, be made.

The home farm will be subject to an incremental programme of enhancements which will meet the key principles given above.

The programme will be incremental, starting in 2021 with:

- ✿ the planting of 12 oak trees in paddocks. The oaks will provide habitat for invertebrates and birds, their roots will bind the soil, reducing erosion and poaching, they will provide shade and acorns for livestock, and will add interest and diversity to the landscape for our visitors.
- ✿ Increasing livestock rotation, which will reduce the risk of parasitic burden in livestock and increase recovery of the soil.
- ✿ Increasing horticultural growing space, improving access for our visitors with ambulatory disabilities, and increasing the availability of all-weather teaching space.

There is no end-point for agroecology in the home farm – it is an ongoing process. Our aim is to encourage more wildlife whilst producing foods that are the cornerstone of a healthy diet and continuing to improve our educational and care farming programmes.

In the last 50 years, Britain has lost ...

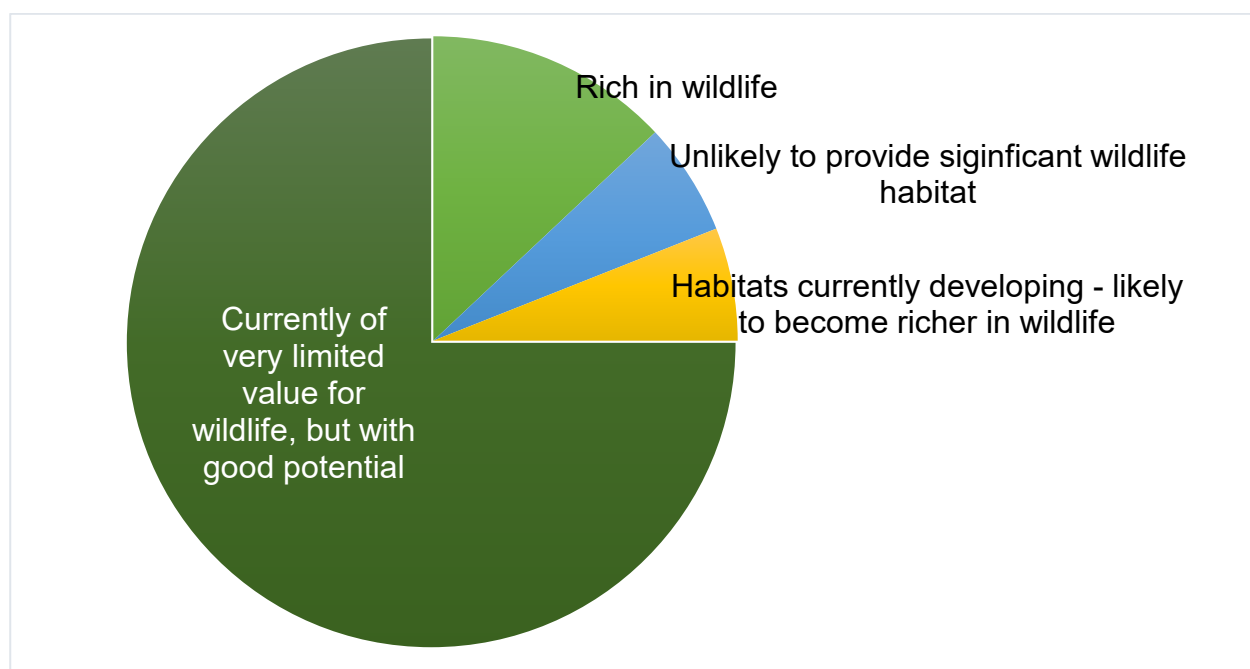
57% of its butterflies

Rewilding the wider farm

Beyond the 7 acres of home farm are 125 acres also owned by the trust. They are a mixture of:

- ✿ 4 acres of mature woodland, most of which is used within the education and care farming programmes – an important tool to help our visitors fall in love with nature, but at the detriment of wild species which would otherwise inhabit the wood.
- ✿ 7 acres of species rich unimproved neutral grassland and scrub
- ✿ 11 acres of hay meadow, half of which is rich in summer wildflowers
- ✿ The River Axe and five tributary streams.
- ✿ 6 acres of indigenous woodland plantation, under 10 years old.
- ✿ 3 acres of unmanaged coarse grassland over the river
- ✿ 4km of hedgerows
- ✿ 90 acres of organic pasture.

Approximately 13% of the available land is rich in wildlife.



In the last 50 years, Britain has lost ...

95% of its hedgehogs

It is not practical for the charity to manage agroecology on the wider farm – we lack the funds and resources, and it is not financially sustainable for us to farm with wildlife gains. Historically, from an ecological point of view, the pastures at Magdalen have been overgrazed, preventing diversity of life, while the wildlife-rich slopes, (which require precisely controlled grazing), have been under-grazed, allowing grasses to predominate, posing an imminent threat to floral diversity.

The solution for the wider farm is a controlled version of rewilding – recreating the conditions for natural processes to take place to create new habitats within the constraints of a relatively small site.

Natural succession and natural disturbance

Understanding these two processes is key to understanding rewilding.

Natural succession:

Left ungrazed, competition between plants will gradually favour those plants that grow the highest, taking most of the sunlight. This means that grassland will slowly, eventually turn to woodland. Neither the start nor the end points are necessarily biodiverse.

Natural disturbance:

Grazing and browsing animals clear woody growth as they eat and as they move through the landscape, opening opportunities for other plants and their attendant invertebrates to live. This soil disturbance is an example of how vital animals are in a conservation management regime. For example, cattle walking through mud break up the sward, leaving bare earth and allowing light to penetrate where it would otherwise not reach. Ox eye daisies are among the plants which thrive on soil disturbance.

The interplay between these two processes – what plants need and what herbivores need, shapes habitats, and is the keystone of rewilding. Without it, the choice is stark between either grasslands or woodlands. Nature's preference, which provides the most diversity of life, is an ever-fluctuating equipoise between the two.

Grazing zones

The wider farm will be divided into zones, in order to:

- ✎ Enable the pulse-grazing as recommended by ecologists' advice. The areas that are currently botanically poor are subjected to grazing for periods of time, and then left without grazing for c.2 years. Zones 1, 2 and 3 will be subject to this regime.
- ✎ Protect the wildflower and invertebrate rich meadows on the SNCI slopes, Bennett's Hill and Maypole. These are Zones 4 and 5.

This map shows the five zones, (and home farm, which will not be subjected to rewilding).

Areas of green open space in the centre of the farm, not included in any Zone, will remain permanently accessible to grazing animals, and therefore remain close cropped pasture.



In the last 10 years, Britain has lost...
33% of its bees

Ideally, rewilding grazing regimes should be carried out with a variety of animals which replicate, as close as possible, the habits found in the wild. In Britain, this means trying to recreate conditions that no longer exist.

There has been considerable research into, and practical application of, rewilding in Britain over the last 20 years, (please see the annex below on advice and guidance).

Cattle are considered the single most important animal to keep for rewilding as their behaviour is the most conducive to natural disturbance and spreading wild seeds. We will follow the guidance from Knepp estate for an area of 125 acres and aim to keep 8-10 steers..

It seems likely that the project will benefit from the addition of a small number (approximately 3) Exmoor ponies, probably from about 2024 onwards, once natural succession is underway. Exmoor ponies are hardy and can graze all winter. Their preferences are different to those of cattle with the two species together creating diverse habitats.

In addition, we will continue to keep Boer goats, which will browse zone 4 in the autumn and winter.

We already keep a herd of pigs. The pigs will be released in the fields (except for the floodplain) in the autumn 2022 for a limited time, in order to break up the sward, after which we will sow wildflower seeds.

In the last 10 years, Britain has reduced public spending on conservation by 42%

Wetlands and the river Axe

In addition to the agroecology and grazing regimes already described, we propose to restore wetland on the farm, which will provide an incredibly wildlife-rich additional habitat. Data from trial pits dug in 2022 and geomorphological features confirms that these areas were seasonal wetlands before the river channel was dredged / affected by the removal of bedload and large woody debris, and before the southern fields, rich in springs, were drained to improve them for agriculture.

In June 2021 we enacted the first phase of river restoration works, using existing riverside trees to make a matrix of large woody debris to slow down peak flows and to capture waterborne silt, will restore the river's ability to burst its banks in winter. A rocky check-weir was also installed, and it will be interesting to compare the benefits of these two approaches.

Blocking up field drains in the southern fields will cause rainwater and spring water to accumulate in enormous quantities. Both these actions will create seasonal wetlands. The map below shows the approximate extent.

There is the potential for an exciting second stage of works on the River, supported by the Environment Agency, which would involve lifting the river out of its current bed, and reintroducing it to the floodplain. The purpose of these works would be habitat restoration significant all the way down to the sea.



Seasonal wetland restoration areas

In the last 50 years, Britain has lost ...

98% of its species-rich grasslands

Timetable

Year	Actions	Outcomes	Costs
2021	Plant oak trees in paddocks in home farm and protect them from livestock.	Shade for livestock Habitat and food source for wildlife Reduce soil poaching	Staff time already covered and materials already on site.
	Bring new a field into use for goats in the spring, and new access to scrub in the summer.	Improved wellbeing of the livestock	Electric fencing: c.£120 Staff time: c.£130
	Repurpose the stable for chickens, enabling better rotation of animals	Improved wellbeing of the livestock Reduced impact on the soil	Materials: c.£500 Staff time: c.£100 <i>both grant funded</i>
	Vaccinate the goats against foot-rot and introduce them into Zone 4 in the autumn and winter	Conserve the rare grassland habitat by browsing scrub. Improved welfare of the goats, enabling them to stay out over winter.	c.£60
	Enact the river habitat works agreed with the environment agency – a matrix of woody debris in the river increasing sedimentation and flooding	Improved water quality downstream Increased habitat in the river as it passes through Magdalen Farm. Creation of an exemplar conservation project to be used for education	£45,000 <i>Fully grant funded</i>

Year	Actions	Outcomes	Costs
2022	Cut silage / haylage / hay in all the pastures in which new habitats are to develop. Use contractors for this and sell the hay.	Reduce soil fertility to a level more conducive to encourage biodiversity.	<i>Approximately £2500 income from sale of silage & hay cropping rights</i>
	Cut hay on Maypole close	Provide a feed-source for the livestock while in barns, including cattle for c. 4 weeks in December – January	£500
	Dig trial pits to establish the abundance, location and depth of groundwater	to inform detailed design for new wetland creation	£2000
	Install new stock proof fencing and handling pens, then introduce pigs temporarily into the fields once the second hay cut is done in the summer. Move the pigs between fields as required	Open the sward to enable natural succession.	Broadcasting seed: £9500 (grant funded)
	Carry out baseline surveys – (botanical and lepidoptera surveys already in place)	Establish baseline data throughout the site	£3,850 and staff time
	Monitor the results of works in the river Axe	To inform wider river-management and the potential for a second stage of river restoration work	<i>No cost anticipated, monitoring done by EA</i>
	Plug up field drains in Springhead and Long common in the autumn	Water retention leading to reduced soil loss down the field drains.	staff time.
	Purchase 8 steers, and install a locking yoke for TB testing etc.	To enable conservation grazing of the wider farm zones 1-5, and to maintain short grasses in the heart of the farm and mid-floodplain for the benefit of our visitors	c. £8,900
	Apply for planning permission for ponds and river works		<i>Not quantified</i>

Year	Actions	Outcomes	Costs
2023	Begin the pulse-grazing regime in the wider farm,	Improved habitat for winter migrant birds	<i>Not quantified</i>
	dig scrapes and ponds	Habitat development and habitat diversity	<i>to be subsidy-funded</i>
	Further enhancements of home farm (to be determined)	Combination of benefits to wildlife, visitors and livestock.	<i>Not quantified</i>
	Block 2 culverts to enable stream water to inundate the floodplain	Wetland creation	£650 plus staff time
	Excavation of initial new ponds	Wetland and open water habitat creation	£2,800 <i>and additional costs with associated grant funding</i>
	Make and install nest boxes	Increased wildlife habitat	£650
	Tree planting – copses and large parkland trees	More diverse habitat created	£26,423
	<i>Funding permitting – commission the hydrological modelling and design for reintroducing the river back into its paleochannel</i>	<i>Improved river habitat, improved connectivity between river and floodplain, improved water quality downstream</i>	<i>Not quantified</i>
2024	Continue with the management regimes as above, and purchase of c.3 Exmoor ponies	Enhanced conservation grazing.	Exmoor ponies: £3,000 estimated
	Make and install nest boxes	Increased wildlife habitat	£650
	Tree planting – copses and large parkland trees	More diverse habitat created	£26,423
	<i>Funding permitting – reintroduce the river into the paleochannel</i>	<i>Improved river habitat, improved connectivity between river and floodplain, improved water quality downstream</i>	<i>Not quantified</i>

Costings

The costs listed below are those currently planned for, with outline costs established. Other works are currently being costed and funding being secured; for greater wetland creation, more fencing infrastructure and for access improvements.

	Year: 2022	2023	2024
Cattle and pony purchase	£6,900		£3,000
Race & locking yoke	£2,000		
Maintenance to infrastructure	£500	£1180	£500
Stock fencing & handling pens	£22,000		
Wildflower seed introductions	£9,500		
Hay cutting	£600	£600	£600
Trial pits for to wetland creation	£2,000		
Surveying for baseline data	£3,850		
Trees for planting, and tree protection		£26,423	£26,423
Wildlife nesting boxes		£650	£650
Pond excavation		£2,800	
Veterinary costs		£2,414	£2,414

The risk of bovine tuberculosis is unquantifiable. The figures above assume TB is present in the herd, and we have to follow TB testing regimes, for half the time period.

Annexe – Advice and case studies

Natural England and the Environment Agency

We are working closely with Natural England to ensure our actions meet best practice guidance and to ensure we can provide maximum benefit to wildlife.

Our approach to habitat restoration in the river is informed by, and driven by, the Environment Agency. These two agencies are our most significant partners.

SNCI botanical advice

Our SNCI has been inspected recently, and the report (which focuses on botany) is very encouraging. The implication is that the management regime of our nature hotspots is working well. This survey was carried out at the behest of the Dorset Wildlife Trust.

Rewilding advice

We have taken advice from two ecological consultants: Greenwoods and EcoLogic. They have given general encouragement and pieces of specific advice when asked about individual features.

The Knepp Estate is a great nature conservation success story – probably the most famous example in the UK of a farm being given over to nature, (and still retaining an income from the sale of meat). However the Southern Block at Knepp, (which as a developing wood pasture has relevance to our ambitions), is 10 times larger than Magdalen. That said, Knepp demonstrates great potential benefits both to wildlife and in terms of education. A delegation of Magdalen staff have benefitted from training on-site at Knepp in the principles and practices used there, and how they can be translated to our smaller site.

Powerstock Common

The Powerstock Common reserve demonstrates a landscape reverted from farmland to nature reserve. There are elements of the reserve which would be highly desirable at Magdalen in terms of habitat quality, and in terms of the education programme. On our board of trustees we have some direct experience of this process: Martin Biss was involved in the creation of the reserve.

Butcherlands Farm

Butcherlands Farm is probably the best case study we have.

It was purchased by the Sussex Wildlife Trust in 2001 because it lies adjacent to Ebernoe Common, a nature reserve of great importance. Butcherlands is similar in size and geology to Magdalen, and in many ways is directly comparable. The main difference is, Magdalen's flora is better than we believe Butcherlands' was when the Wildlife Trust bought it.

The advice given to us by the ecologist who has planned and controlled the development at Butcherlands is to create different zones, and to pulse-graze them. That is, not to establish a single long term grazing regime for particular fields, but to create different habitats by changing the grazing every couple of years. A field may be grazed fairly low for a year or two to remove the thatch of dead grass and to let light down to the soil, then not grazed for a while to allow trees to establish. Key to the success at Butcherlands is to encourage only slow change. For instance - don't protect trees from grazing animals, let them become stunted and grow slowly, keeping light available at ground level. The trees will get away eventually. Butcherlands also demonstrates that sooner or later, if flower-rich, open, scrubby wood pasture is the desired outcome, bramble cutting will become inevitable, though it might take 20 years. The invertebrate population at Butcherlands, even in areas which have become poor in flowers through overgrazing, is very strong indeed. It has achieved the desired *biomass* mentioned above.