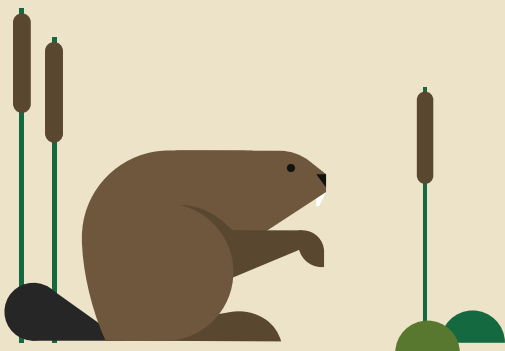


REWILDING AND CLIMATE BREAKDOWN: HOW RESTORING NATURE CAN HELP DECARBONISE THE UK



rewilding
britain



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FOREWORD

We are at a crossroads. The breakdown of our climate is no longer a fringe concern, but is increasingly recognised by the public as an urgent existential threat to both nature and human society. The gap between our awareness of that threat and the inadequacy of our current response has become clear.

This report is a contribution to bridging that gap. New thinking and practical action is urgently needed if the UK Government is to meet its legally-binding commitments to combat the catastrophic effects of climate change.

Taking a different approach to the way land is managed is as important as high-tech solutions to address climate breakdown. The UK has an opportunity to become a world leader in natural climate solutions. This report outlines how we can support land use change to reduce carbon emissions and remove carbon from the atmosphere as well as stop the ongoing loss of the UK's biodiversity.

Those who manage our land play a pivotal role and should be supported to come together to deliver major carbon reductions. We offer a costed proposal for how existing EU agricultural subsidies can be replaced with additional dedicated funds raised using a polluter-pays levy. This would mean diversifying land uses in response to the climate emergency in a way that also sustains a vibrant, resilient future for rural communities. This future should be tailored to each context and guided by local leadership, using credible and non-bureaucratic ways to measure the outcomes for communities and the environment.

Our proposals build on existing indications of a change of approach – for example the increasingly accepted 'public money for public good' principle for recognising good stewardship of the land and sea, and the National Farmers' Union (NFU) commitment to reach net zero emissions by 2040. We show that they can be achieved without the significant loss of high quality, productive farmland.

Meanwhile we are learning at amazing speed about the role that living systems play in our shared prosperity, and how nature can bounce back, if we let it.

Rewilding cannot solve climate change on its own but it could play a pivotal role. What we are calling for is more public debate around how our countryside is managed into the future and how we balance sustainable farming with ensuring local people can make a viable living.

Rebecca Wrigley,
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SUMMARY

- We must radically change the way we manage our land, sea and other natural assets if the UK is to meet its legally-binding climate targets and stop the ongoing loss of our biodiversity.
- Reducing carbon emissions alone will not be enough to keep the heating of the planet below 1.5°C. Large amounts of carbon also need to be removed from the atmosphere.
- Rewilding and other natural climate solutions can draw millions of tonnes of carbon from the atmosphere by restoring and protecting our living systems. Evidence suggests they could provide over a third of the greenhouse gas mitigation required globally between now and 2030¹. Yet so far they have attracted only 2.5% of funding for mitigation², and far too little political attention.
- The rewilding of peatlands, heathland, native woodlands, saltmarshes, wetlands and coastal waters in the UK can all make a significant contribution to carbon sequestration. Additional benefits include flood mitigation, water quality improvement, increased health and wellbeing, enhancement of biodiversity and landscape amenity value.
- Brexit and the replacement of the EU Common Agricultural Policy (CAP) subsidy system provides a once-in-a-generation opportunity to promote a transformational change in land use that protects our climate and allows both people and wildlife to thrive.
- Those who work and manage the land play a pivotal role. They should be rewarded for delivering carbon reductions as part of a mosaic of land uses that sustains thriving rural communities.
- This report outlines how a new subsidy system could, through a rewilding-based approach, financially support farmers and other landowners to increase carbon sequestration on their land and restore damaged and degraded ecosystems.
- This new system could make a substantial contribution to achieving the UK's commitments under the Climate Change Act as well as supporting the land use sector to meet the targets set by the NFU of net zero emissions by 2040.
- If £1.9 billion of the £3 billion currently spent on CAP payments were allocated to supporting native woodland re-establishment, the restoration and protection of peatbogs and heaths, and species-rich grasslands over a total of 6 million hectare (ha), this could sequester 47 million tonnes of CO₂/year. This is more than a tenth of current UK greenhouse gas emissions. This compares to the UK Government's current commitment of £50 million to help plant new woodlands through the Woodland Carbon Guarantee and only £10 million towards peatland restoration³.
- Rewilding Britain is calling for the UK and devolved governments to make a bolder financial and political commitment to nature's recovery. We are asking them to:
 - » Integrate carbon sequestration into any new 'public money for public goods' mechanisms to incentivise large-scale natural climate solutions. We propose a model of payments that values carbon sequestration and biodiversity enhancement in different restored ecosystems, particularly focused on less productive and marginal landscapes to minimise the impact on opportunity costs for food production. Our indicative annual standard payments would support restored peat bogs and heathland at £292/ha, woodland at £512/ha, species-rich grassland at £144/ha, saltmarsh at £322/ha, ponds and lakes at £204/ha and offshore ecosystems at £161/ha per year. Land holdings that come together to form contiguous zones of recovering, protected and restored ecosystems could attract enhanced payments.
 - » Establish a mandatory economy-wide carbon pricing mechanism linked to carbon emissions to raise dedicated revenue to help fund natural climate solutions. This should incentivise emissions reductions whilst providing additional funds to support carbon sequestration activities in the agricultural and land use sectors.
 - » Support locally-led partnerships to coordinate action across landholdings to ensure natural climate solutions are designed and brokered locally within each ecological, economic and cultural context.

1. SETTING THE SCENE

Global climate context

Global warming of 1°C has already taken place since the pre-industrial period, almost entirely due to human emissions of greenhouse gases. We are now seeing the devastating consequences of this increase, including disappearing coral reefs, heavier and more extreme rainfall, prolonged droughts, intensified wildfires and a dramatic decline in Arctic sea ice extent.

We have little time to address the crisis. The 2018 report from the UN's Intergovernmental Panel on Climate Change (IPCC)⁴ states that restricting global warming to 1.5°C above pre-industrial levels would require a 45% reduction in net human-caused emissions of CO₂ by 2030, global carbon net neutrality by mid-century, and then the removal of billions of tonnes of atmospheric carbon dioxide for the rest of the century. The IPCC also stated that we have less than 12 years to make the necessary changes.

We want to see the heating of the planet kept below 1.5°C. For this to happen it is clear that reducing emissions alone will not be enough. Carbon needs to be removed from the atmosphere too.

Aiming below 1.5 or 2°C?

Climate science and policy has looked at a number of potential pathways for lower levels of global temperature change. Some have focused on keeping within 1.5°C of warming and some 2°C. We support efforts and policies aimed at keeping global warming below 1.5°C, but in this document we sometimes refer to evidence that focuses on a 2°C target.

UK context

The UK has long-term, legally-binding targets for reducing its emissions. The Climate Change Act 2008 requires that net carbon emissions are 80% lower than the 1990 baseline level by 2050, and sets a series of five-year carbon budgets as milestones along the way. More recently the Government's Climate Change Committee (CCC) has proposed a 'net-zero' target for 2050, which would be reflected in new legislation to update the 2008 Climate Change Act⁵.

Thanks largely to the rapid decline of coal in the power sector, the first budget's requirements were exceeded, and the UK is on track to meet its commitments on the second and third. But from 2023 the numbers look far more challenging, and the CCC stated in its latest progress report to Parliament that the UK is not on course to meet the legally-binding fourth and fifth carbon budgets.

The agricultural sector is itself a large contributor to greenhouse gas emissions. In 2016 agriculture emissions were 46.5 million tonnes of CO₂ equivalent (the impact of different greenhouse gases expressed in terms of the amount of CO₂ that would create the same amount of warming), accounting for 10% of UK total emissions. Without urgent action to decarbonise, agriculture will be one of the largest-emitting sectors by 2050⁶.

Much of the early reduction has been made with relatively straightforward steps, such as switching from the most carbon-intensive forms of energy production like coal towards gas and renewables. Further reductions will require more profound measures across the whole economy.

2. REWILDING AS A 'NATURAL CLIMATE SOLUTION'

Overview

In 2017 an international team of conservationists and climate experts published a paper in the journal PNAS that proposed a new approach to reducing greenhouse gases in the atmosphere by the use of what they called 'natural climate solutions'. These were 20 conservation, ecological restoration and improved land management strategies that increase carbon sequestration (removal) or avoid emissions across forests, wetlands, grasslands and farmland worldwide. These natural climate solutions could provide over a third of the CO₂ mitigation required by 2030 to keep to a likely 2°C pathway, the experts suggested⁷, and could be a powerful and effective supplement to decarbonisation of the economy.

These proposals have now been taken up by a global campaign asking governments to support natural climate solutions with an urgent programme of research, funding and political commitment⁸. Currently it is estimated that only 2.5% of the money spent on climate mitigation is directed towards approaches that work to improve natural ecosystems⁹. Natural climate solutions, such as rewilding, can achieve negative emissions in a way that works with nature and benefits human societies rather than threatening the wellbeing of both through the diversion of large areas of land to forestry-based 'Bio-Energy with Carbon Capture and Storage' (BECCS, see Box).

The natural climate solutions approach is particularly important given the May 2019 report from the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES), which found that 1 million species "already face extinction, many within decades, unless action is taken to reduce the intensity of the drivers of biodiversity loss"¹⁰. It is vital therefore that climate mitigation promotes ecosystem restoration together with carbon sequestration.

BECCS: The dark side of carbon reduction

Reducing carbon emissions alone will no longer be enough to address climate change. Billions of tonnes of carbon need to be removed from the atmosphere in order to avoid dangerous levels of warming. However, some forms of carbon reduction risk disastrous side-effects for human wellbeing and biodiversity.

Bio-Energy with Carbon Capture and Storage (BECCS) means growing biomass (organic matter used as a fuel) in plantations, burning it in power stations to produce electricity, capturing carbon dioxide from the exhaust gases and burying this liquified stream of waste gas underground in rock formations.

According to scientific analysis, deployment of BECCS on even a moderate scale could take up over a billion hectares (three times the land area of India) of the world's most productive agricultural land, or imply the removal of over half the world's natural forests¹¹.



2. REWILDING AS A 'NATURAL CLIMATE SOLUTION' *Cont.*

What rewilding can offer

Rewilding is the large-scale restoration of ecosystems and the reinstatement of natural processes. It enables nature to take care of itself and encourages a balance between people and the rest of nature where each can thrive. Rewilding is fast emerging as one of the most powerful, cost-effective and life-affirming ways to rise to the challenge of climate breakdown and loss of wildlife.

The potential benefits of rewilding are exciting and varied. They include restoring higher levels of biodiversity, protecting communities at risk of flooding, creating more opportunities for human wellbeing in nature, and the economic revival of rural areas through new, nature-based enterprises. Rewilding creates a dynamic mosaic of areas where nature is left to take care of itself interconnected with areas which can sustain a range of high-nature value productive activities, such as low impact silviculture (tending, harvesting and regenerating a forest), harvesting of natural products and extensive meat production.

Any of these benefits alone might be reason enough to support more rewilding of our land and seas. But another feature of rewilding could be of pivotal importance in the next few years – the sequestering of carbon from the atmosphere.

These restoration efforts pull carbon out of the atmosphere and store that carbon in forests, vegetation and in the soil. On the land and sea, rewilding's ability to restore soils and seabeds, native plant communities and living reefs, trees and sea grass can create valuable carbon sinks.

For example, globally peatlands store more carbon than the world's rainforests. The UK has about 13% of the world's blanket peat bog, classified by the International Union for Conservation of Nature (IUCN) as one of the world's rarest habitats. These peatlands represent the single most important terrestrial carbon store in the UK¹², and yet some 80% of them have been damaged by drainage, extraction, burning and overgrazing (see box p8).

In Britain we can choose to protect and restore our internationally-rare peat bogs, which form a crucial store of the Earth's carbon. Re-wetted peatland can stop emitting carbon and transition toward becoming a net carbon sink, once peat-forming plant species are re-established.

Other precious habitats such as heathland, native woodlands, saltmarshes and wetlands can also make a significant contribution to removing carbon. Lowland fens – of which only a fraction of the original area remains in eastern England – can be strong carbon sinks, while dwarf shrub-dominated upland heath – which covers 2-3 million ha in the UK – can sequester twice as much carbon as grasslands¹⁶.

The potential for forest regrowth is even greater. The UK has large areas of grassland which lie naturally within the broadleaved forest biome and yet are mostly devoted to extensive livestock grazing – supported largely or even entirely by agricultural subsidies – while producing little food, supporting few wildlife species and leading to soil erosion and downstream flooding.

Scientists calculate that naturally regenerated forests can sequester several tonnes of CO₂ per hectare (ha) from the atmosphere per year after they become fully established¹⁷. The re-introduction of ecosystem engineer species (organisms that profoundly shape habitats, such as beaver) – a key objective of rewilding – can also contribute to carbon absorption through the creation of new wetlands, as well as increase species richness and biodiversity in general¹⁸.

Around our coasts, rewilding also offers the prospect of restoring balance to marine ecosystems, allowing life to flourish and helping to regulate carbon levels in the seas. In contrast, repeated trawling disturbs sediments and reduces carbon storage as well as devastating sea floor ecosystems¹⁹. Protecting shelf seas (seas close to the coastline) from trawling and dredging could make a significant contribution to carbon sequestration.

2. REWILDING AS A 'NATURAL CLIMATE SOLUTION' *Cont.*

For peat's sake

Peatland is formed by an accumulation of mosses and other plants, and is one of the greatest stores of carbon in the landscape. Globally, peatlands store more carbon than the world's rainforests. And unlike woodland, which becomes saturated once it matures, peatland goes on drawing down carbon over centuries and millennia as layers of peat accumulate.

In total, peat bogs of both the blanket and raised (generally lowland) types cover around 10% of Britain's land area, with half of that being in Scotland. Peat has an important function in providing freshwater: the UK and Republic of Ireland account for 85% of global consumption of peat-sourced water¹³.

However, much of our peatland is subject to draining, burning, afforestation with plantations, overgrazing, wind farms and other developments that disrupt ecology and hydrology and strip peat of its ability to draw down carbon from the atmosphere.

Although not currently included as part of the UK's carbon accounts, damaged UK peatlands are likely releasing almost 3.7 million tonnes of CO₂ each year, equal to the emissions of 660,000 UK households¹⁴. About half of this comes from lowland fens which have been drained and converted to agricultural use: studies show as much as 30 tonnes of CO₂ equivalent per hectare per year in emissions from drained lowland fens¹⁵.

Rewilding our damaged upland bogs and mires - by blocking drainage ditches, reducing grazing pressure and helping native plants thrive there again - could make a major 'win-win' contribution to the UK's part in tackling climate breakdown. Not only would it stop the harmful effects of their current use, but it would begin to sequester significant amounts of carbon from the atmosphere in restored upland blanket bogs. When healthy peatland's contribution to the production of clean water and flooding reduction is taken into account too, the case for their restoration becomes stronger still.



3. OPPORTUNITY FOR CHANGE – A FUTURE FOR BOTH PEOPLE AND NATURE

The critical need to prevent climate breakdown makes change an immediate imperative. We must urgently consider how to deploy natural climate solutions across the UK as part of the broader need to deliver on our legal commitments to drastically reduce carbon emissions, and to sequester additional carbon from the atmosphere in decades to come.

Natural climate solutions require major changes to the way the UK manages its land. In the past, supported by agricultural subsidies, much of our farmland has been ecologically impoverished, with hedgerows destroyed, accelerated losses of topsoil, overgrazing of our uplands and ongoing reductions in wildlife from birds to amphibians to insects. Our peat bogs, which should be a global treasure, have been drained, burned, ploughed and otherwise degraded and as a result are emitting millions of tonnes of CO₂ per year into the atmosphere instead of sequestering it.

The UK's exit from the European Union would make change to the agricultural subsidy regime inevitable, and this change offers a rare and significant opportunity to design a system that improves on the CAP in delivering a more sustainable approach to food production on British farms as well as better outcomes for wildlife and broader landscape ecology. Rewilding is a major part of this opportunity.

The UK Government has already indicated that, in the event of Brexit, it will replace the EU CAP with an improved system based on the principle of 'public money for public goods'. According to the current Agriculture Bill, the transition period would begin immediately after Brexit, and continue towards a complete ending of basic payments after a transition period of seven years, starting in

2021. We see this post-Brexit restructuring of the UK's agricultural sector as a once-in-a-generation opportunity to design a new system that works in the interests of both farmers and wider society.

Encouragingly, UK Government policy is already pushing in the right direction. "We will incentivise methods of farming that create new habitats for wildlife, increase biodiversity, reduce flood risk, better mitigate climate change and improve air quality by reducing agricultural emissions...We will achieve this by ensuring that public money is spent on public goods, such as restoring peat bog and measures which sequester carbon from the atmosphere," states the Government's paper 'Health and Harmony: The future for food, farming and the environment in a Green Brexit'²⁰.

The UK Government's Brexit farming strategy is based on an earlier policy document called 'A Green Future: Our 25 Year Plan to Improve the Environment'²¹, published in 2018. This paper proposed planting woodland, increasing biodiversity and mitigating and adapting to climate change as likely candidates for any system of 'public money for public goods'. However, the carbon reduction policies proposed in this 25 Year Plan were largely piecemeal and voluntary, such as "domestic carbon offset mechanisms to encourage private sector investment and develop markets for domestic carbon reduction" and a "Forest Carbon

3. OPPORTUNITY FOR CHANGE – A FUTURE FOR BOTH PEOPLE AND NATURE *Cont.*

Guarantee scheme, using the existing Woodland Carbon Code". This piecemeal approach has been tried already, and has largely failed due to the complexity of the system and the lack of a strong market signal on carbon.

Moreover, offsetting of industrial or other emissions can only be a stopgap approach in the short term given that all emissions sources have to be cut to zero eventually. It is therefore essential that natural climate solutions are not used as a substitute for decarbonisation of the economy, but as a supplement to it. This is in line with the Government's 'Clean Growth Strategy'²² published in October 2017 as well as the work being done on reviewing targets set in the Climate Change Act on net zero emissions in line with the Paris Agreement.

Although the Scottish Government has not yet made substantive policy proposals, the Welsh Government has proposed a scheme that *"will enable farmers, foresters and other land managers to be paid for the production of goods for which there is currently no functioning market. The scheme will be outcome-based and we will often use proxy outputs to calculate payments to land managers."*²³

It states that one outcome is *"improved mitigation of climate change risk. The output proxy could be number of tonnes of carbon dioxide sequestered in new woodland on a farm (estimated based on land area and type of woodland)." In essence what we propose in Section 5 of this report shows how the Welsh Government's suggested system could work in practice.*

Our proposals mesh well with the current draft of the Agriculture Bill, which gives the Secretary of State power to give financial assistance for *"managing land or water in a way that protects or improves the environment"* as well as *"mitigating or adapting to climate change"*, among other objectives.

There is a convergence of thinking from multiple stakeholders on the necessary direction of future policy. In a 2018 report on land use and climate change, the UK Government's CCC stated that

"using land released from agriculture for carbon sequestration and restoring natural habitats can deliver deep emissions reduction by 2050", and that this could be done without compromising on overall food production if combined with measures to improve farm productivity and encourage healthy eating²⁴. The CCC also stated that: "The key measures that have clear, multiple benefits are: afforestation and forestry management; restoration of peatlands; low-carbon farming practices; improving soil and water quality; reducing flood risks and improving the condition of semi-natural habitats."

In its Net Zero technical report, published in 2019, the CCC called on the Government to: *"Develop a post-Common Agricultural Policy (CAP) framework that incentivises the take-up of low-carbon farming practices and promotes transformational change in land use that rewards land owners and managers for deep emissions reduction and removals and delivering wider ecosystem benefits."*²⁵ This is exactly what this Rewilding Britain report seeks to do, and we hope it can assist the Government's policymaking efforts to meet the new proposed net zero carbon target.

The NFU is also aligned with this broader objective of climate mitigation in agriculture. In its February 2019 response to the CCC, the NFU stated: *"We are committed to reducing agricultural and land-based emissions, and we have a special role in creating 'negative emissions' since most of these pathways begin with the plants that we grow capturing carbon from the air."*²⁶ Their stated aim is that farming must reach 'net zero' emissions by 2040.

The following section outlines in more detail how our proposal can support all these converging objectives and use the opportunity of the replacement of the CAP to develop a vastly improved system that works in the interests of both farming and the environment.

4. WHAT REWILDING BRITAIN IS PROPOSING

We need to radically change the way we manage our land, sea and other natural assets if we are to meet our climate goals and reverse the ongoing decline in the UK's biodiversity.

This can be achieved without the loss of high quality, productive farmland or a net reduction in agricultural output. It is the least productive marginal lands, where the opportunity cost for food production is comparatively small, that provide the best options for carbon sequestration, rewilding and other ecosystem services.

To put this in context of the scale of other land uses in Britain:

- Grouse moor estates cover around 1.3 million ha in England, Scotland and Wales²⁷
- Deer stalking estates account for around 1.8 million ha in Scotland²⁸
- Blanket and raised bog peatlands cover around 2.3 million ha or 9.5% of the UK land area
- Cereal crops are grown on 3.2 million ha of the UK and oilseed crops on 590,000 ha, out of a 'total croppable area' of 6.1 million ha²⁹

We propose a system that would adequately recognise the potential for rewilding to increase carbon sequestration and contribute to meeting UK carbon targets and that could transform the level of funding available. The benefits could be significant and wide-ranging.

This is an opportunity for the UK to become a world leader in the delivery of natural climate solutions in response to the climate emergency we are facing. We are calling for the UK and devolved governments to:

- 1. Integrate carbon sequestration into any new 'public money for public goods' mechanisms to incentivise large-scale natural climate solutions**
- 2. Establish a mandatory economy-wide carbon pricing mechanism linked to carbon emissions to raise additional dedicated revenue to fund natural climate solutions**
- 3. Support locally-led partnerships to coordinate action across landholdings/marine areas for the delivery of natural climate solutions**



4. WHAT REWILDING BRITAIN IS PROPOSING *Cont.*

1. Integrate carbon sequestration into any new ‘public money for public goods’ mechanisms to incentivise large-scale natural climate solutions

We support the ‘public money for public goods’ principle and believe that this should be largely centred around a model of payments that values carbon sequestration in different restored ecosystems to deliver long-term mitigation of climate change.

Future subsidies should be used to support farmers and others managing the least agriculturally productive areas to stay on the land whilst delivering carbon reductions and transitioning towards more diverse, resilient nature-based economies. These subsidies could be layered to reflect where there are also additional contributions to public goods such as biodiversity enhancement, flood mitigation, water quality improvement, water table stabilisation and so on.

In essence, farmers and land managers would be paid a per-hectare amount based on the type of land in question and the restored natural ecosystem that it would be supporting. The specific figures proposed are outlined in Section 5 and in the table here, but in brief a specified carbon price would be multiplied by the quantified tonnage of carbon that could potentially be sequestered in the restored natural ecosystem type. This means that the payments system has a quantitative basis in science rather than being arbitrary.

Simplicity is key: bureaucracy and over-complication is one of the main reasons the CAP Pillar II (environmental) schemes were poorly utilised and unpopular among farmers. There would be a cap of around 1,000 ha for any individual landholding to avoid inadvertently benefiting the largest landowners but we propose that enhanced incentives should be given for land holdings to come together to form contiguous zones of recovering, protected and restored ecosystems.

It is obviously important to strike a balance in UK farming between food production and carbon sequestration, biodiversity, flood mitigation and other land use objectives. Therefore it is necessary that subsidy levels are not set so high as to outstrip financial returns from crop production in more productive lowland and arable systems and perversely incentivise the wide-scale abandonment of food production in UK farming.

To give an idea of cost effectiveness we estimate that if £1.9 billion of the £3 billion currently spent on CAP payments were allocated towards supporting native woodland re-establishment on rough grassland, and restoration and protection of peatbogs and heaths over 6 million ha, this could sequester 47 million tonnes of CO₂ per year, more than a tenth of current UK greenhouse gas emissions.³⁰

While existing carbon offset projects tend to have a heavy burden of monitoring and verification, it is impractical to do this over millions of hectares. Therefore it is suggested that simplified Peatland and Woodland Carbon Codes could provide the carbon accounting methodologies - with the addition of biodiversity and rewilding elements - and would be accountable to the funder in delivering the required ecological improvements. These monitoring and verification arrangements would be no more burdensome than at present. This proposal needs to be supported by a regulatory framework which should be enforced through law.

It is important to note that we do not propose that this system comprise the entirety of UK agricultural subsidies. There will no doubt be other objectives that the Government wishes to support, and ‘public payments for public goods’ may be augmented by other financial support paid to farmers. For this reason we propose below a source of funding that could be additional to continued agricultural subsidies in other areas.

Ecosystem type	Standard payment/ha/yr
Peat bogs and heathland	£292
Woodland	£512
Species-rich grassland	£144
Saltmarsh	£322
Ponds & lakes	£204
Offshore	£161

4. WHAT REWILDING BRITAIN IS PROPOSING *Cont.*

2. Establish a mandatory economy-wide carbon pricing mechanism linked to carbon emissions to raise additional dedicated revenue to fund natural climate solutions

The UK Government has stated its intention to move towards a 'polluter pays' model to fund carbon mitigation after Brexit and the UK's consequent withdrawal from the EU Emissions Trading Scheme (ETS). Determining how this mechanism would work in a detailed sense is beyond the scope of this report, but it is clearly an opportunity to close the loop in terms of carbon mitigation if the proceeds increase the revenue available to incentivise carbon sequestration activities in the agricultural and land-use sectors.

It would make sense to have a single economy-wide price on carbon, established by the Government as part of a mandatory emissions pricing system which removes the grandfathering element of the existing EU ETS (whereby emissions permits are perversely handed out free to existing polluters). This price per tonne would be paid by emitters from all sectors of the economy from transport (including aviation and shipping) to industry to power generation. It would incentivise emissions reduction and also raise funds for carbon sequestration in restored ecosystems at a basic rate of the same price per tonne for carbon sequestered as for carbon emitted.

The current 'price floor' operated by the UK is £18 per tonne, and EU ETS prices are around 20 euros per tonne. To generate a more reliable income stream, and to reflect the real social cost of carbon, we propose adopting the revised BEIS (Department for Business, Energy and Industrial Strategy) carbon values used for UK public policy appraisal. We believe this is also a reasonable starting level for a carbon tax because if it is set too low there is insufficient incentive to drive decarbonisation of the economy.

Our proposal is to then offer a higher level of payments – double or triple basic payments – to larger contiguous land areas which can be entered into the scheme jointly as outlined in Section 5.

What levels of revenue might this yield? The UK's emissions are 460 million tonnes of CO₂ equivalent per year, so if a carbon price was applied across the economy at £40 per tonne this yields a theoretical upper limit of £18.4 billion, although in reality not every tonne of carbon is accounted for so the real figure

will be much lower. Even so, there would be sufficient revenue to cover the entire scale of our proposal, even with higher-level payments.

As it would take time for these benefits to be realised, they could be funded by an escalating economy-wide carbon price which fully reflects the higher social costs of carbon in future decades. Over the very long term, the aim of a carbon price is to incentivise the transition towards a fully net-zero carbon economy. At this point it stands to reason that yields from carbon emissions would also fall to zero, removing this source of revenue.

However we envisage that by this point, many decades hence, rural communities would be transitioning to a more diversified economic model that could ultimately operate without general support from public funds. This model is therefore proposed as a short to medium-term transition scheme rather than a permanent settlement.

According to BEIS:

"These long-term carbon values reflect the costs required to limit global temperature increases to 2 degrees centigrade above pre-industrial levels."³¹ In this report, we conservatively use the 2030 'low' value of about £40 per tonne of CO₂ equivalent, though this can be replaced with the higher values if certain requirements are met. This should not be taken to mean that we consider £40 a tonne to be an appropriate carbon price indefinitely – to avoid climate breakdown much higher prices will be needed to drive urgent economy-wide decarbonisation."

4. WHAT REWILDING BRITAIN IS PROPOSING *Cont.*

3. Support locally-led partnerships to coordinate action across landholdings/marine areas for the delivery of natural climate solutions

The best use of land to support climate change mitigation will vary across Britain depending on the local economic, ecological and cultural context. Local decision-making will be needed to determine the best approach and to coordinate actions across multiple landholdings. Achieving sufficient scale also requires decision-making at a scale larger than that of any single landholding or individual marine user. It relies on people coming together across multiple holdings and sectoral interests to collectively explore alternative ways of managing land and sea linked to contiguous zones of recovering, protected and restored ecosystems.

We therefore propose the creation of locally-led entities or partnerships to coordinate cohesive action across multiple landholdings/marine areas. These legally constituted entities, usually a combination of private landowners, communities and private sector businesses, will be able to collectively deliver greater benefits at a landscape scale in terms of carbon

reduction, wildlife populations, water quality, soil etc. In addition, they will bring collective bargaining power to broker public payments, provide a marketing/trading platform for local products and ecosystem services, offer a means of monitoring carbon reductions and ensure that benefits accrue to local communities.

Support should also be provided to these partnerships to help land managers transition to alternative uses. This includes help with skills, training and information to implement new uses of land, financial support for high up-front costs and long-term pay-backs for investing in alternative uses linked to rewilding. It should also include action to address barriers to the take-up of new nature-based enterprises and forms of production.



5. HOW WILL THIS WORK IN PRACTICE?

Rewilding Britain is already working to model in the real world how these payment systems could work at scale. Our pilot projects include O’r Mynydd i’r Môr/Summit to Sea in mid-Wales, which aims to bring together an interconnected area of at least 10,000 ha of land and 28,400 ha of sea where flourishing ecosystems support resilient nature-based enterprise. In this area we are collaborating with a broad partnership and across multiple landholdings to test how payments for public goods might work in practice.

What we are proposing for this, and other similar areas across the UK, is a system of both standard payments and enhanced or premium payments where land holdings come together to form contiguous zones of recovering, protected and restored ecosystems. A starting proposal for both standard payments and enhanced payments is outlined below. This is based on existing evidence but also highlights where further research is needed.

Standard payments – a starting proposal

Ecosystem type - Peat bogs and heathland	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£292	<p>The carbon dynamics of peatlands are complicated. Currently UK peatlands are, overall, thought to be emitting carbon due to drainage and poor management, with the CCC estimating “<i>net emissions from all peatlands sources of around 18.5MtCO₂e currently.</i>”³² Therefore the carbon-related payments for peatland restoration and recovery need to average out avoided emissions as well as sequestration on healthy peat-forming boglands.</p> <p>Estimates of carbon accumulation in peatlands also vary widely. A 2018 literature review reported 0.24 tonnes/ha/year as a long-term average for northern peatlands, with other UK estimates varying from 0.18 to 2 tonnes/ha/year³³. Estimates of the carbon sequestration potential of heather-dominated heathlands in the literature vary from 0.6 tonnes/ha/year³⁴ for a restored ecosystem to 3.45 tonnes/ha/year for existing upland areas in Scotland³⁵. The latter paper concludes that heather moorland sequesters double the carbon of grasslands, and states that “<i>the potential rate of [carbon] sequestration by upland heath is comparable to that of woodland</i>”.</p> <p>Accordingly we select a mid-level estimate of 2 tonnes of carbon/ha/year. Converted to CO₂ equivalent (by multiplying by 3.66) and multiplied by a £40/tonne carbon price, this gives a figure of £292/ha/year for heathlands and peatlands.</p> <p>To qualify for payments, land managers would have to invest capital and ongoing management costs in blocking drains, to maintain a sufficiently high water table for peat formation to resume. Vegetation might also need to be restored, especially with the major peat-forming sphagnum moss species, and grazing would need to be absent or strictly limited to native herbivores. Studies have shown that the exclusion of large herbivores from upland heathland can increase carbon storage potential, although this is complicated by nitrogen dynamics.</p> <p>To avoid any perverse incentives (i.e. to degrade and then restore) we propose that intact areas of bog should attract the same support. Peatland hydrology must not be disturbed by access roads for grouse shoots or windfarms, and no peat must be removed from the landscape.</p>

Standard payments – a starting proposal

Ecosystem type - Woodlands	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£512	<p>There is a pressing need for large-scale native woodland regeneration in the UK, particularly on rough grassland that does not have organic (peat) soils. While naturally-regenerating forest in the shrub phase may only store 0.6 tonnes of carbon/ha/year, this rises to 2.4 tonnes/ha/year by 2050 as woodland becomes established³⁷, and 4.1 tonnes/ha/year thereafter³⁸. Maximum sequestration rates in fast-growing British forests can be as high as 6-10 tonnes/ha/year, though this is more likely to be in lowland woodlands.</p> <p>Although natural regeneration is slower to accumulate carbon in tree biomass than planting trees, we believe the carbon price payable per ha should be the same across the board to account for the ecological benefits of natural regeneration, such as minimised disturbance to the ground. This should incentivise natural regeneration as costs of establishing woodland in this way are much lower than with more intensively-managed approaches.</p> <p>Therefore we propose an immediate mid-level assumption of 3.5 tonnes/ha/year. To convert to CO₂ this needs to be multiplied by 3.66, and then multiplied by our carbon price of £40 per tonne, which yields an overall figure of £512/ha/year.</p> <p>As with peatlands, we propose that this should be payable to owners and managers of old-growth native forests in order to remove any perverse incentive to deforest and restore. Commercial conifer plantations should not be eligible, except where they are removed and replaced with native woodland. In addition, scrub and bracken should not be seen as a negative presence on the landscape, but as a useful succession phase to more established woodland.</p>

Standard payments – a starting proposal

Ecosystem type - Species-rich grassland	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£144	<p>A recent paper found that UK grasslands hold as much as 2 billion tonnes of carbon, a substantial store, and that less intensive management (in terms of fertiliser added and grazing/cutting regime) results in more carbon being stored³⁹.</p> <p>On average European grasslands are thought to be a small sink of carbon, of about 0.15 tonnes of carbon/ha/yr⁴⁰. However, estimates vary by an order of magnitude or more⁴¹. Even though they may hold substantial carbon in soils and leaf litter, grasslands do not accumulate carbon in perpetuity as do peatlands and some forests. Therefore unless a change of management regime encourages more carbon sequestration, annual carbon payments are not merited⁴².</p> <p>A beneficial change of management regime might be reducing grazing, or switching from sheep to cattle or other native-equivalent herbivores. For example, a 2014 study on Glen Fingas estate in Scotland concluded that <i>“no sheep and low-intensity sheep grazing are better upland management practices for enhancing plant and soil C sequestration than commercial sheep grazing”</i> and that ungrazed grassland vegetation holds double the carbon of grazed⁴³.</p> <p>Although there is again a notable paucity of scientific data, it also seems likely that species-rich grasslands sequester more carbon than monocultures. One recent study⁴⁴ found that <i>“high-diversity mixtures of perennial grassland plant species stored 500% and 600% more soil C and N than, on average, did monoculture plots of the same species”</i>⁴⁵. Similarly, a study in northern England found a species-rich hay meadow (with clover added in seed) sequestered as much as 3 tonnes of carbon/ha/yr, while other plots which were fertilised and had lower diversity even lost carbon⁴⁶.</p> <p>We assume an annual carbon sequestration/avoided emissions rate of 1 tonne of carbon/ha/year for grasslands. This is 3.6 tonnes/ha/year in CO₂ equivalent terms, meaning that with a £40 carbon price, managers of restored peatlands could be paid £144/ha/year. We propose that this would only be payable where a reduction/cessation in grazing and/or an increase in biodiversity in cut meadows can be clearly demonstrated.</p> <p>This lower carbon price (as compared to woodlands and peat bogs for example) reflects not only the science but the fact that an economic return from livestock and vegetation removal (hay) can still be earned, perhaps to support premium value extensive meat production in a dynamic mosaic of natural/grazed/cut areas.</p>

Standard payments – a starting proposal

Ecosystem type - Saltmarsh	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£322	<p>Saltmarshes and other coastal ecosystems can sequester very large amounts of carbon in sediments, as well as being important for fisheries, biodiversity and coastal protection. In addition, in order to adapt to rising sea levels, we need to incentivise managed coastal retreat and allow transformation of existing agricultural land that is no longer viable into saltmarsh.</p> <p>Recent estimates in the scientific literature yield a figure of 2.2 tonnes/ha/year⁴⁷. Multiplied by 3.66 to convert to CO₂ equivalent and with a carbon price of £40/tonne this means saltmarshes would be eligible for payments of £322/ha/year.</p> <p>It has been shown that grazing dramatically reduces carbon accumulation in saltmarshes, so removal of grazing pressure is vital under this scheme⁴⁸.</p>

Ecosystem type - Ponds and lakes	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£204	<p>There is a less extensive literature on the carbon accumulation rates of lakes and ponds. One recent study suggested average rates of 1.4 tonnes/ha/year⁴⁹. Multiplied by 3.66 to convert to CO₂ equivalent and with a carbon price of £40/tonne this means ponds and lakes would be eligible for payments of £204/ha/year.</p> <p>Land managers would need to provide detailed maps of their holdings in order to qualify, but this already applies with the current subsidy system of Basic Payments and any additional 'greening' payments. It is worth noting that under the current system ponds and lakes are classed as 'permanent ineligible features', so farmers are given an incentive to destroy rather than safeguard them⁵⁰. We would also include wetlands in this category.</p>

Standard payments – a starting proposal

Ecosystem type - Offshore ecosystems	
Suggested standard payment for carbon benefits (ha/yr)	Notes
£161	<p>Offshore habitats, particularly seagrass meadows, are also large carbon stores and sinks. However, carbon can be rapidly released when they are damaged by trawling or other human activities. We would propose that payments incentivise the restoration and protection of coastal shelf ecosystems against the damage inflicted by trawling fisheries, particularly where community-led.</p> <p>However, the carbon sequestration potential is too uncertain to set a clear price at present, and it is worth noting the potentially vast aggregate area under consideration here. One recent estimate is that seagrass ecosystems accumulate about half as much carbon as saltmarsh⁵¹, giving an indicative price of £161/ha/year. This may well be more than the value of these ecosystems realised by repeated trawling, and could thereby incentivise their full protection as no-take marine conservation zones.</p>

5. HOW WILL THIS WORK IN PRACTICE? *Cont.*

Enhanced payments for greater benefits

We propose that the BEIS mid-level carbon price of £80 be payable for land areas which are able to achieve a minimum cluster of 5,000 ha in total area (known as Nature Recovery Networks). We do not propose this for offshore shelf as the area is too large to be financeable. An even higher incentive, such as the top level BEIS carbon price of £120 per tonne, should be payable once highly valued and ecologically crucial native species are shown to be permanently present in the Nature Recovery Network zones, creating highly rewilded ecosystems. These species might include beaver, lynx, osprey, pine marten and so on.

Nature Recovery Network payment at £80/year carbon price		Highly rewilded ecosystems at £120/year carbon price	
Ecosystem type	Suggested enhanced payment for carbon benefits (ha/yr)	Ecosystem type	Suggested full payment for carbon benefits (ha/yr)
Peat bogs and heathlands	£584	Peat bogs and heathlands	£876
Woodlands	£1024	Woodlands	£1536
Species-rich grassland	£288	Species-rich grassland	£432
Saltmarsh	£644	Saltmarsh	£966
Ponds and lakes	£408	Ponds and lakes	£612

5. HOW WILL THIS WORK IN PRACTICE? *Cont.*

Costings and feasibility

How do these figures compare with the current subsidy regime? In the UK, £3.1 billion was spent in the last year on agricultural subsidies under the CAP, with only £400 million of that being for agri-environment schemes. Most of the remainder is 'basic payments' paid by hectare, benefiting the largest landholders and contributing little to environmental protection. Estimates for the national average of basic payments are around £230 per ha in 2017, well below most of the enhanced figures above.

Since this includes arable land, perhaps the best comparator is with non-moorland upland SDA ('Severely Disadvantaged Areas' – this is a land productivity rather than a social/economic designation) which received 178 euros (£155) in 2017 and upland SDA moorland which received 50 euros (£43) with small 'greening' supplements payable for both⁵².

However, if our proposed 'public money for public good' system seems generous compared with CAP subsidies, consider that some of the 'Countryside Stewardship' payments available from public funds are very much comparable: for example, £640 per ha is payable for planting winter food for seed-eating birds, £511 for a nectar flower mix for pollinators and £524 for nesting plots for curlew and lapwing⁵³.

To compare this with the financial returns from more productive arable systems, the gross margin for feed wheat was reported at £744 per hectare in 2018, and for winter oilseed rape it was £662.⁵⁴ Unlike our proposed payments for rewilding, these take costs into account, and are significantly higher than most basic ecosystem restoration payments. Even so, as stated earlier this report does not claim to propose an entire replacement agricultural subsidy system and the government may wish to support food production in other ways, such as through price volatility support, incentivising productivity growth and trade tariffs.

Another test of viability might be an overall costing. Allowing natural forest regeneration on 2 million ha of land currently used for low species-diversity grassland would, under the lowest tier of our proposed payment system, cost about £1 billion per year, a third of current CAP spending overall. Adding the majority of the UK's peatlands and heaths, covering about another 2 million ha, would raise the cost by another £584 million. Adding also 2 million ha of species-rich grassland would add another £288 million to the annual cost. **This totals £1.9 billion, about two thirds of the current CAP system.**

It is important to note that this would be for a drastically improved environmental outcome: all three land types in this example are frequently degraded and losing both carbon and biodiversity. And the public subsidies currently paid often act to damage rather than restore them. This £1.9 billion would support the sequestration of 25.6 million tonnes of CO₂ equivalent per year in new native woodlands, 7.2 million tonnes of CO₂ equivalent per year in species-rich grasslands and 14.6 million tonnes of CO₂ equivalent per year in peatlands and heaths. (These figures are derived by multiplying the hectares above with the carbon sequestration figures assumed for each ecosystem and used to calculate the payable subsidies.) Together these represent 47.4 million tonnes of CO₂ equivalent per year of carbon sequestration potential⁵⁵ – just over a tenth of current UK emissions⁵⁶ – for roughly two thirds of the price of the current CAP system.

Moreover, the proposed carbon pricing system would provide a new dedicated source of additional funding that would be more than sufficient to cover the entire scale of our proposal, even with higher-level payments. In contrast, current CAP payments come out of general taxation and so have to compete with other social and political objectives.

5. HOW WILL THIS WORK IN PRACTICE? *Cont.*

How do our proposals compare in geographical scale to the proposals of both the UK Government and the CCC in terms of ambition? The Government has proposed 500,000 hectares for the Nature Recovery Networks it plans to develop⁵⁷. It also proposes 480,000⁵⁸ – 800,000⁵⁹ hectares of new woodland by 2050, and the restoration of only 5,851⁶⁰ hectares of peatland. However, so far it has only committed £50 million to help plant new woodlands through the Woodland Carbon Guarantee and £10 million towards peatland restoration⁶¹. The CCC proposes a ‘high ambition’ scenario which would see 1,500,000⁶² hectares of new woodland by mid-century, and the protection/restoration of all 2 million hectares of peatland⁶³.

While this report does not claim to propose an entire new subsidy regime and could sit within the newly proposed Environmental Land Management Scheme (ELMS), we do envisage the abolition of the basic payments scheme (BPS). The BPS has given billions in public money to large landowners – a highly inequitable and regressive system. In order not to replicate the inequities of the BPS we

propose a cap for subsidies of 1,000 ha per holding where land holdings are substantial – such as on large upland estates. This should ensure that the scheme is more equitable and does not incentivise land speculation or disproportionately benefit the largest landowners. We also propose that in tenanted systems the payments should go to tenants rather than landowners as is currently the case.

There is ongoing consideration of how the scheme might apply to commons, which exist across Britain and are subject to differing access and grazing regimes. Many commons have different owners and graziers, where the latter exercise grazing rights under law. Any reduction in grazing or change in management to benefit carbon storage and biodiversity needs to be incentivised by financially rewarding current graziers, and we propose any payments are proportional to current grazing rights where these are exercised. This is a complex area, however, and proposals require refinement and consultation.



GLOSSARY OF TERMS

Amenity value	The idea that something has worth because of the pleasant feelings it generates. This value is often used in cost-benefit analysis to determine the worth of natural resources that will not be harvested for economic gain.
BECCS	Bioenergy with Carbon Capture and Storage
BEIS	Department for Business, Energy and Industrial Strategy
BPS	Basic Payments Scheme
CAP	Common Agricultural Policy
Carbon sequestration	The long-term storage of carbon in plants, soils, geologic formations and the ocean
CCC	The Committee on Climate Change is an independent, statutory body established under the Climate Change Act 2008 to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.
CO ₂ equivalent	Carbon dioxide equivalent or CO ₂ e is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO ₂ e signifies the amount of CO ₂ which would have the equivalent global warming impact.
ELMS	Environmental Land Management Scheme
ETS	Emissions Trading Scheme
IPBES	The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services is an independent intergovernmental body, established by member states in 2012. The objective of IPBES is to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human wellbeing and sustainable development.
IPCC	The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.
IUCN	International Union for Conservation of Nature
Natural climate solutions	Conservation, ecological restoration and improved land management strategies that increase carbon sequestration or avoid emissions across forests, wetlands, grasslands and farmland.

GLOSSARY OF TERMS

NFU	National Farmers' Union
Paris Agreement	An agreement signed in 2016 at the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse gas emissions mitigation, adaptation and finance. It is a landmark environmental accord that was adopted by nearly every nation to address climate change and its negative impacts. The deal aims to substantially reduce global greenhouse gas emissions in an effort to limit the global temperature increase in this century to 2°C above pre-industrial levels, while pursuing efforts to limit the increase to 1.5°C.
Rewilding	Large-scale restoration of ecosystems and the reinstatement of natural processes which allow nature to take care of itself and encourage a balance between people and the rest of nature, where each can thrive.
Shelf seas	Shallow sea close to the coastline
Siviculture	The process of tending, harvesting and regenerating a forest.

CREDITS

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FURTHER INFORMATION

For further information on this report, visit <https://www.rewildingbritain.org.uk> or contact communications@rewildingbritain.org.uk

APPENDIX

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⁵²'Farmers set for increased payments as the Rural Payments Agency confirms BPS 2017 entitlement and greening rates', DEFRA & Rural Payments Agency, 2017. <https://www.gov.uk/government/news/farmers-set-for-increased-payments-as-the-rural-payments-agency-confirms-bps-2017-entitlement-and-greening-rates>

⁵³'Mixed Farming Offer: Countryside Stewardship', Gov.uk, 2019. <https://www.gov.uk/government/publications/mixed-farming-offer-countryside-stewardship>

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⁵⁴'Greater Farming Profits Expected in 2018', FarmBusiness, 2017. <http://www.farmbusiness.co.uk/business/greater-farming-profits-expected-in-2018.html>

⁵⁵It is worth restating however the wide degree of uncertainty regarding the carbon accumulation potential of highly variable ecosystems and situations, so this figure should be taken as indicative rather than definitive.

⁵⁶'2017 UK Greenhouse gas emissions, provisional figures', BEIS, 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/695930/2017_Provisional_Emissions_statistics_2.pdf

⁵⁷'A Green Future: Our 25 Year Plan to Improve the Environment', DEFRA, 2018. <https://www.gov.uk/government/publications/25-year-environment-plan>

⁵⁸The Government states in its response to our petition (see footnote below) an ambition to increase the wooded area of the UK from 10% to 12% by 2060, which we calculate as adding another 0.48 million ha, given a UK land area of 24.1 million ha (excluding inland water bodies – this figure comes from ONS, UK Natural Capital Land Cover in the UK. <https://www.ons.gov.uk/economy/environmentalaccounts/articles/uknaturalcapitalandcoverintheuk/2015-03-17>). Currently there are 1.4 million ha of broadleaved and 1.4 million ha of coniferous woodland in the UK.

⁵⁹According to the CCC, "England and the DAs have an ambition to increase woodland creation, which if achieved, would deliver annual planting of 20,000 hectares by 2020 and 27,000 hectares from 2025". This delivers roughly 0.8mha by 2050 of new woodland. See 'Net Zero Technical report', Committee on Climate Change, May 2019. <https://www.theccc.org.uk/publication/net-zero-technical-report/> p.211

⁶⁰This figure is for restoration of degraded peatlands and does not include current natural state peat bogs. DEFRA, Government response to a Rewilding Britain parliamentary petition (<https://petition.parliament.uk/petitions/254607>) states: "We have committed to publishing an England Peatland Strategy. The strategy will set out our vision to reverse decline in peatlands and restore them, which is in line with the Government's commitment to be the first generation to leave the natural environment of England in a better state than we found it. Work is underway on four large-scale peatland restoration projects across England, to which we have allocated £10 million, and will restore 5,851 ha of degraded peatlands."

⁶¹See Government response to a Rewilding Britain parliamentary petition: <https://petition.parliament.uk/petitions/254607>

⁶²The Committee on Climate Change suggests "high ambition could achieve 50,000 hectares of new woodland per year", which x30 years from 2020 to 2050 is 1.5 million ha. Presumably this includes coniferous plantations too; however our proposals are to financially support native broadleaved and other species (like scots pine and yew) only. See 'Net Zero Technical report', Committee on Climate Change, May 2019. <https://www.theccc.org.uk/publication/net-zero-technical-report/> p.211. For comparison only, 9000 ha of new trees were planted last year.

⁶³Centre for Ecology & Hydrology and Rothamsted Research, 2018: 'Quantifying the impact of future land use scenarios to 2050 and beyond – Final Report', Final report for the CCC. <https://www.theccc.org.uk/publication/quantifying-the-impact-of-future-land-use-scenarios-to-2050-and-beyond-centre-for-ecology-and-hydrology-and-rothamsted-research/>. This is peatland restored by 2050, which involves changing the vast majority of 'unimproved grassland' on peat soils to fully rewetted peat. See p.43, Table 19.

