

Wilder Carbon – Written evidence (NSD0043)

EXECUTIVE SUMMARY

What is the potential scale of the contribution that nature-based solutions can make to decarbonisation in the UK?

Modelling undertaken by Wilder Carbon sets out the potential of unlocking the climate benefits of large-scale nature restoration across the UK. **The initial headline figures show that delivering native habitat restoration across the UK as a major Natural Climate Solution (NCS)¹ at the, highly achievable, scale suggested within the detail below, would lock up a minimum of 857,836,964 tonnes CO₂e over the next 30 years.**

This carbon lock-up would double over the following 30 years, and many habitats would continue to sequester more carbon beyond that. Plus, the scale of sequestration suggested as possible in this report is only based upon using “low-cost” areas of land and sea. We can, and should, go beyond this given the state of natural emergency we are now in.

And vitally, **this carbon sequestration value could be monetised through sale of genuine ‘removals offsets’, i.e. each tonne of carbon locked up being matched to an equivalent real-world carbon reduction action, suggests that £173,602,663,355 could also be generated to fund this major strategic endeavour** by harnessing private capital that would otherwise go abroad.

The potential for native habitat restoration as a major Natural Climate Solution therefore clearly needs to be fully recognised and mainstreamed across multiple domestic policies here in the UK. In doing so we would be providing a blueprint for what’s necessary across the rest of Western Europe.

We can no longer just think in terms of simplified tree planting or restoration of small areas of upland peat. We have much more to gain by applying native habitat restoration across all applicable geographies and scales. NCS must not be under-valued, or unnecessarily simplified in a way that comprises its effectiveness.

There are, of course, barriers that need to be overcome to do this, beginning with the opportunity for supportive legal and financial structures that positively incentivise landowners to make long-term commitments in favour of managing

¹ Natural Climate Solutions

Natural climate solutions are conservation, restoration and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands. They harness habitat restoration via natural processes including ecosystem engineer species to facilitate biodiverse, abundant and climate resilient land/seascapes.

their land for carbon and biodiversity uplift. This is required to unlock the substantial sums of private capital to deliver NCS at the scale and speed required.

When we talk about “Nationally Significant Infrastructure Projects” large-scale restoration of nature through schemes like Wilder Carbon is what we should be thinking about first rather than road building. Nature is the infrastructure on which we all rely. It’s time to restore nature for the sake of our species as well as those species we live alongside.

Wilder Carbon is an initiative borne from within the Wildlife Trusts with a simple proposition, to ensure that large-scale restoration of native ecosystems across the UK as a major weapon in our arsenal in combating climate change.

Our full and finalised report setting out the workings of our modelling is due release this Autumn and is a first attempt to model what restoring nature at this scale could mean in terms of carbon reduction, as well as how we can use this to fund something we’ve not so far been able to achieve.

We believe this all adds up to something that makes large-scale restoration of nature into an urgent strategic imperative from a climate standpoint: a Nationally Significant Infrastructure Project – in governmental terms.

There are, of course, a huge number of technical complexities around this issue. The authors fully recognise this. None-the-less, Wilder Carbon is in a good position to take a holistic view of what’s needed based on 18 months of conversation with scientists, governmental and conservation agencies, potential investors and financiers, sustainability experts, and landowners.

There is lots to learn still but we don’t have time to prevaricate, and we can work with the information we have to deliver action that will benefit us all. It’s about learning by doing and improving along the way.

Call for Evidence – Key Questions

Which ecosystems are most relevant to the UK for nature-based solutions, and which have the largest potential to sequester carbon or reduce emissions?

We welcome the use of ‘ecosystems’ in this question. Individual habitats like woodlands, peatlands, coastal and inland wetlands, scrub, species rich grasslands, and the seabed all have a vital role for nature based solutions in providing wildlife rich, climate resilient landscapes that can lock up carbon for the long term if restored to full ecological functionality.

But, we need to be able to stitch what would, in the global context, be seen as small NCS projects into a cumulative programme of action with significant domestic benefits as a contribution to larger global efforts to scale-up ‘in nature’ carbon removal programmes e.g. the creation of oceanic sea pastures, to which the UK can also contribute.

Our modelling quantifies the potential carbon sequestration gains that could be made across the UK landmass and inshore marine areas by enhancing natural habitats. The general approach was to identify the extent of possible change in land uses or habitats due to Wilder Carbon, quantify the likely change in carbon sequestration these would deliver, and calculate the associated financial values.

This encompasses a great degree of variation both socially and biophysically, so the analysis has been split into five scenarios to make it more meaningful. The scenarios are:

- Protected areas. This considered the carbon sequestration benefits from reverting substantial portions of SSSIs, SPAs, national parks and AONBs to a variety of natural habitats.
- 2% reversion of agricultural land to woodland. This considered the carbon benefits from natural woodland regeneration on 2% of UK farmland. Additional co-benefits were also estimated for biodiversity, recreation, air quality, heat reduction, noise reduction and flood prevention.
 - More detailed farmland assessment. This considered the carbon benefits of allowing the most suitable areas of farmland to revert to a variety of natural habitats.
- Pop-up Knepp. Carbon benefits were calculated for taking arable land into an alternating 20-year cycle of arable cultivation and woodland regeneration.
- Marine. Carbon benefits were calculated for fully restoring Marine Conservation Zones, Marine Protection Areas and all UK inshore areas to healthy, intact habitats.

Each scenario has its own set of assumptions, approximations and estimations that are explained individually in the full upcoming report, as well as setting out the detailed approach and parameters of this work.

Which ongoing governmental plans, policies, and strategies are relevant to nature-based solutions, and can they be better coordinated? For example, are the Nature for Climate Fund and associated targets for peatland and forestry restoration designed so as to support nature-based solutions?

The Government has committed to protect 30% of land and sea to boost biodiversity. But the Environmental Audit Committee (EAC) recently declared that there is a huge gap between this rhetoric, the targets, the funding and the mechanisms to do this.

At the moment 26% of the UK's land is already regarded as protected by the government. However, analysis by Sarnes et. al. 2021 indicates that "as little as 5% of the UKs may be effectively protected for nature".

The 2019 Government-commissioned Glover Review of National Parks and Areas of Outstanding Natural Beauty (AONBs) highlights the need for "a transformed approach to recover and enhance nature, working with farmers and conservation groups to reverse years of decline and bring landscapes alive". And, the EAC

regards “the UK’s protected areas (as) poorly managed” saying that “more focus must be given to preserving and enhancing (their) quality”.

However, there is no evidence that the amount of money required for this transformation is forthcoming. Although the Government increased Natural England’s baseline funding by £11.3 million for 2020–21 and has committed to increasing this by a further £75 million, the EAC considers this “does little to provide the consistent multi-year investment required. (for its) new responsibilities for nature recovery.”

Other key agencies are similarly underfunded. As the Financing UK Nature Recovery report 2021 notes “there is no doubt that current spending is not reversing nature’s decline, and that the additional finance needed is expected to be in the billions of pounds”.

At the same time the UK Government has faced criticism regarding the lack of mechanisms and committed investment to deliver on its ambitious climate change targets, which arguably need to go even further faster. The ‘policy gap’ identified by the Climate Change Committee – the UK’s independent adviser on tackling climate change – identifies, amongst other things, a lack of thinking on climate adaptation. The House of Lords Environment and Climate Change Committee goes further asserting the need for action to boost nature internationally and mentioning the importance of the “climate change and biodiversity interface”. Both, however, fail to clarify the opportunity that restoring nature at scale in the UK holds as a key mechanism to address climate change.

Meanwhile, various major corporate initiatives are recognising exactly this. The Natural Climate Solutions Alliance regards quality NCS projects as capable of ‘delivering the Paris climate goals, as well as solutions to some of the world’s most pressing and intractable environmental and social challenges, biodiversity and forest loss, land degradation, sustainable water management and sustainable community livelihoods’.

These are likely to gather pace as multiple benefit, Carbon Plus, schemes are recognised as one of the most effective, defensible, value-for-money, ways for businesses to deal with their environmental impacts.

Further momentum is being achieved through calls for the UK government to “to legislate for mandatory disclosure of nature-related impacts by businesses” off the back of 2020 established, UK government-backed, Taskforce for Nature Disclosure (TFND) and the 2021 launch of the Voluntary Carbon Market’s Initiative (VCMi).

Therefore, applying Natural Climate Solutions here in the UK presents a window of opportunity to leverage private capital and invest in nature restoration that compliments government policy, enabling a speed and scale of implementation that is otherwise going to be difficult to achieve.

How could nature-based solutions implementation contribute to the UK’s goals surrounding biodiversity, the preservation of nature, and adaptation to climate change?

AND

How do the costs and benefits (including co-benefits), of implementing nature-based solutions compare to other techniques for offsetting 'hard-to-decarbonise' sectors?

In the current absence of large-scale, affordable, and immediate carbon reduction and/or engineered carbon capture technology, we can start working on delivering significant NCS now. Doing so is key because it takes time for ecosystems to recover and lock up carbon.

Getting going now will start to increase our chances of avoiding significant ecological tipping points that will result in runaway climate breakdown and increasingly disruptive impacts on global society i.e. our climate warming by more than 1.5C which will be catastrophic for many communities in our world.

Our modelling is aimed at providing initial, high-level quantification of the cumulative impact of broadening the extent of area, the scale, and types of ecosystems we could restore through the carbon lens and the sequestration that could be achieved over a relatively limited, 30-year timeframe to find out what sort of dent this could make in UK PLC's climate mitigation and adaptation strategy.

At the same time contributing to, and providing the mechanism to pay for, restoration goals via the Nature Recovery Network, for example.

Are there good examples of nature-based solutions already being undertaken in the UK or elsewhere, and what can we learn from them?

To-date, only limited NCS solutions have been bought to bear in the UK over a limited geography, driven by relatively narrowly-focussed single habitat initiatives and policies including the restoration of peat, and – in particular – planting of trees.

Unfortunately, tree planting can be distorted into a commercial forestry agenda. Timber production will only provide long-term carbon lock-up (known as permanence) if it is linked to a transformed, low-carbon, building sector that ensures carbon locked up in timber doesn't end up back in the atmosphere within a couple of decades as the wood is burnt after use.

This long-term/strategy has yet to be formulated, let alone implemented. Plus, non-native trees sometimes increase net C sequestration due to increased risk of fire, and pests, as well as by reducing soil carbon; planting trees in non-tree'd landscapes can locally increase absorption of solar radiation; and they often have negative effects on biodiversity, economic opportunities, and water yield.

By contrast native trees and forests provide higher stability of carbon storage. Plus old, large trees continue to actively sequester carbon – sometimes faster than younger trees. And, scientists from Royal Botanic Gardens Kew confirm that natural regeneration of forests on areas that were historically forested is cheaper and more efficient whenever this is possible.

Meanwhile, current efforts and mechanisms to restore peat are geographically limited leaving large areas of lowland peat, and other upland habitat with significant potential for carbon lock-up i.e. moorlands and grasslands, out of scope. Other non-forested habitats like saltmarsh can actually lock up more carbon than forested habitats.

Taking these significant land areas into account via a more flexible carbon accounting mechanism offers up substantial additional carbon potential, whilst recognising the carbon restoration potential of a broader range of habitats is obviously important given their inherent carbon potential and the increased area that this would open up to delivering NCS.

What major scientific uncertainties persist in understanding the effects of nature-based solutions and affect their inclusion in carbon accounting, and how can these uncertainties be addressed?

AND

Which bodies should be involved in establishing an agreed evidence base to inform best-practice techniques for restoring peatlands?

There is simply not enough data from lack of practice. But there is data; and if we use the cumulative best data in the best way possible, this will give us a basis from which to take vital action now, learning as we go and improving data along the way.

The Financing UK Nature Recovery Report 2020 "Science-based standards and methodologies need to be developed which reflect the principle that lack of full scientific certainty should not be used as a reason to delay action".

The modelling approach that underpins the Wilder Carbon report was developed through a review of all published UK carbon sequestration, storage, and habitat change data undertaken by the Wilder Carbon Team in 2020 in collaboration with, and incorporating thinking from, experts across the Wildlife Trusts, Natural England, and elsewhere in the UK conservation sector.

Our in-house Carbon + habitat tool - provides a method of quantifying the impact of habitat restoration projects in terms of carbon sequestration, carbon emissions reductions and enhancements to biodiversity. It is designed to cover a wide range of UK habitat types where we can reliably predict positive carbon results.

This has enabled the generation of conservative minimum estimates from this data for all key habitats implied through the modelling herein. Carbon sequestration potential is divided into soil and above ground biomass components, and further itemised according to estimates for carbon sequestration at 10-year intervals until maximum sequestration is achieved. In this case a 30-year period was selected as the end point.

The tool also has a facility for estimating biodiversity uplift via integration of the DEFRA biodiversity metrics, and project costs including both initial capital works at the beginning of the project, and long-term management costs. Neither of these uses has however been applied to the modelling detailed in this report.

The data used in the tool will be iteratively updated as more evidence becomes available, whilst the Wilder Carbon initiative, working through its community of practice – including independent researchers – begins to supply some of this data as pathfinder and research and development projects progress, thereby supplementing data that emerges from wider academic literature.

How much of the UK’s ‘hard-to-mitigate’ emissions can be offset by nature-based solutions? How much of the UK’s land and exclusive economic zone (EEZ) coastal areas would need to be managed to achieve this, and what level of investment would be required?

Below is the initial summary conservative estimate (subject to change pending finalised report Autumn release) of how much carbon could be locked up as a minimum by implementing NCS at scale in the UK by restoring a range of carbon stable and carbon sequestering native habitats.

The scenarios modelled are taken as mutually exclusive and therefore, again to err on the side of conservatism in terms of carbon and financial values resulting, the total 30-year values have been generated by adding all scenarios to one another with the exception of 3.1, which can be seen as a potential subset of 3.2.

Summary of cumulative carbon potential of UK across terrestrial and marine environments

	ha	tCO2e/30 years	£/30 years
Scenario 1: Wilder protected areas (30% of terrestrial sites)	1,406,947	514,426,937	£23,149,212,158
Scenario 2: 2% Restored farmlands (arable/grazing)	345,000	11,975,400	£538,893,000
Scenario 3: 20-year restorative agriculture rotation (pop-up Knepp concept) (20yr figures)	399,275	1,304,298	£58,693,392
Scenario 4: Wilder Protected areas (marine)	2,449,601	330,130,329	£14,855,864,805
Total	4,241,473	857,836,964	£38,602,663,355

How reliable are the estimates of the quantity of greenhouse gas emissions reduction or sequestration by nature-based solutions, as well as the duration and reliability of storage?

Good-practice guidance produced by the Greenhouse Gas Protocol suggests the following with regards conservative use and interpretation of evidence:

“Conservativeness: Use conservative assumptions, values, and procedures when uncertainty is high. GHG reductions should not be overestimated. Where data and assumptions are uncertain and where the cost of measures to reduce uncertainty is not worth the increase in accuracy, conservative values and assumptions should be used. Conservative values and assumptions are those that are more likely to underestimate than overestimate GHG reductions.”

This is exactly the approach we have taken, extending to the way it uses the scientific evidence around values of estimated sequestration rates by explicitly using the lowest value from the range of possibilities suggested by the available science into account.

We cannot let perfect be the enemy of the good and we have to use the best available data in the best way possible to take action, supported by MRV to constantly improve what we know.

Duration and reliability of the storage can be achieved through ensuring permanence. Wilder Carbon believes permanence should be defined as 99 years, which is a commonly accepted definition of perpetuity in the UK. To realise this, it will require ensuring that once land is restored, it continues to be protected and managed in its intended state, through the reinstatement of natural process.

This will require multi stakeholder commitment and a standard by which to be upheld.

To what extent do we understand the capacity of the oceans and coastal ecosystems to sequester greenhouse gases through nature-based solutions?

Of the four scenarios in our report this is the one for which the least data is available and which, conversely has the greatest potential for carbon storage and biodiversity/bio-abundance restoration.

These include Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) with marine components, SPAs with marine components, Nature Conservation MPAs and national MPAs in Scotland.

These sites have been designated with no consideration of their carbon sequestration potential. In fact, the vast majority of them continue to be exploited in a way that prevents ecosystem recovery and therefore biodiversity and carbon uplift.

The UK has 163,302 km² of inshore and inter-tidal habitats largely comprising of high sequestering habitats types including saltmarsh.

All of this area is potentially restorable - with proper enforcement of byelaws to protect MPAs, the implementation of no-take zones to control damaging fishing practices and the protection of intertidal habitats impacted by industrial and recreational activities.

Furthermore, careful balancing of decision making around areas of coastal managed retreat have the potential to not only create greater areas of wildlife habitat but also high sequestering intertidal and marshland habitats. Given the fragility of coastal communities to the impacts of climate change restoration, the creation of more coastal wetland areas is a fundamental Natural Climate Solution in these areas.

The potential levels of investment driven by the carbon storage potential of our marine sites presents a significant opportunity to protect them. This can be achieved through compensatory mechanisms to marine industry and to also fund large-scale restoration of key habitats including sea grass, kelp beds and saltmarsh.

How should a hybrid public-private financing model be regulated? How should any carbon offsetting markets be regulated to ensure that they prioritise and support well-designed and effective nature-based solutions?

AND

What can be learned from the implementation of the Woodland and Peatland Codes for the regulation and financing of nature-based solutions?

AND

How can we ensure that the carbon accountancy is science-based, robust, and consistent across nature-based solutions?

With growing international consensus that offsets can no longer be used as a way of delaying carbon reduction action - as per the launch of Voluntary Carbon Markets Integrity (VCMI) initiative earlier this month - and agreement that high quality removal offsets need to be linked to concrete delivery on carbon reduction it is still clear that private sector finance via offsets will need to be part of getting to net zero by 2050 and/ or carbon positive as we seek to reverse current locked in climate change.

However, whether it is via this type of investment, or other emerging green finance mechanisms including potential governmental sources, the value of the carbon that is modelled as feasible to lock-up through restored native UK habitats can be made to pay for this restoration in a hitherto unaffordable manner. In doing so it can help lift the UK off the bottom of the international biodiversity ratings, whilst helping addressing the Climate Crisis. But, we must broaden our thinking about how we can feasibly deliver NCS here in the UK. It cannot all be about tree planting or other isolated habitats. We need a broadened, landscape NCS approach.

Wilder Carbon have been developing Standards for NCS carbon projects in the UK that could be part of bringing this market to bear in restoring native habitats. Working with multi sector stakeholders this could achieve;

- A recognised benchmark for native habitat restoration projects that address the Nature and Climate Crisis at the same time.
- Filling a void for multi-habitat schemes where using multiple habitat codes would be over-complex.
- Applicability at all scales from national to regional; from Local Authority landholdings to farms, rewilding projects, protected areas, and urban greenspace.
- Changing the landscape of green investment and leverage financing to restore nature at a previously impossible scale in a truly defensible manner.

And, we have the workforce to do it in the form of our world-class land management and nature conservation sectors here in the UK. This is what Wilder Carbon is trying to catalyse.

Forward-thinking UK companies we consulted want to buy credits from high-quality, local provenance, tangible carbon projects here at home.

They recognise 1. that these are – at least initially – going to be more expensive than those currently available abroad; 2. that, given the carbon price is almost certainly going to continue to rise they would be wise to invest early, even at a premium price; as well as 3. acknowledging that doing this through a Standard linked to their own carbon reduction strategy as well as the quality of the project – the latter being assured through the association with trusted conservation organisations with a track-record of holding land into perpetuity, all mean that this type of project is highly desirable.

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