Nature must be at the heart of woodland expansion

Nature-based climate solutions are the ways that nature can help us lock up carbon and adapt to climate change. **Woodland expansion is a potential nature-based solution but must be planned with nature as a priority**. We have mapped where new woodlands could potentially go.

Our recent analysis shows:

- **Semi-natural woodlands** managed for conservation can **store more carbon** over 100 years than Sitka spruce plantations under standard productive management
- There is **just enough lower climate risk soil** in the UK to meet the Committee on Climate Change's high ambition woodland expansion targets
- However, woodland expansion is currently **unbalanced across the four nations** and often focused on soils that are a higher risk for climate change. This could lead to carbon emissions and nature degradation.
- Ensuring that carbon emissions from higher-risk soils are minimised will require a strategic, UK-wide approach **with nature at its heart** to minimise negative trade-offs and ensure new woodlands are genuine nature-based solutions

Nature is vital in the fight for a safe climate

The climate and nature emergencies are urgent issues of our time. The RSPB calls for **ambitious action to reduce emissions**, alongside **reviving nature** for its role in the climate crisis and for a thriving living world.

Maps we published previously show where the most nature-rich areas are in the UK and how much carbon they contain. In total, it's around 545 million tonnes of at-risk carbon in the vegetation and top 30cm of soil– equivalent to four times the UK's annual greenhouse gas emissions. These nature-rich landscapes play a vital role in storing carbon as well as supporting the UK's plants and animals .

Nature is therefore vital in the fight for a safe climate, and it is important that our nature-rich areas are protected as part of our efforts to reduce emissions and mitigate climate change. It is not, however, enough to just protect nature. **We also need to restore it to good health**. RSPB's recent analysis of UK peatlands found that due to their degraded condition, our **peatlands currently emit the equivalent of 5% of our greenhouse gas emissions** every year. This habitat must be restored.

Our **trees and woodlands** are another striking example of nature's role in the climate crisis: they can provide rich and diverse habitat for wildlife, whilst sucking up carbon dioxide from the air and storing it safely.

With only 13% woodland cover, the UK is one of the least wooded countries in Europe, well below the average of 38%. Our landscape is lacking trees: expanding our woodlands in line with the **'right tree in the right place'** principle will be necessary both to fight climate change, and to restore living habitats that help nature recover.

The Committee on Climate Change (CCC) has suggested almost 2 million hectares of new woodland by 2050 in its recent "Widespread Engagement" scenario in the 6th Carbon Budget.[1] This is a significant increase on current rates and suggests substantial changes in land use across the UK as land is taken out of one use, such as agriculture, and assigned to woodland creation instead. A summary of our new analysis of CCC woodland creation scenarios can be found in an annex at the end of this briefing.

Substantial land use change requires careful thought

An expanded woodland area in the UK could be good for wildlife and for carbon. However, the last time we saw woodland creation at these levels, there was a rush to plant non-native conifer plantations in inappropriate places such as the Flow Country in northern Scotland, damaging the deep peat soils and releasing carbon. The RSPB and governments across the UK have spent the last couple of decades trying to reverse such damage done in areas now recognised as important areas for nature and carbon.

It is crucial that we maximise the positive impacts and minimise the negative impact of this sort of land use change. Our new analysis looks to address where it might be appropriate to plant new trees, and what sort of woodland will deliver the greatest benefits for wildlife and carbon.

Where could new woodlands go?

There are places where new trees will **enhance nature and sequester carbon**, but there are also places where they could **damage habitats and degrade carbon rich soils**, like peat. There are also places where we value the **open habitats and species** they support or that are important for **food production**.

There are already major pressures on land in the UK. For example, we need the land to produce food, but much of the area that is potentially available for planting is currently classed as low-grade agricultural land. Some farmland may be freed up for planting if there is a change in diets to less and better meat, reducing the area needed for livestock, alongside enhancing on-farm woodland planting within and alongside established agricultural systems. However, these aspects are outside the scope of this analysis.

We have sought to identify areas where significant woodland expansion **might be feasible**.[2] To identify these areas we have avoided **important open non-woodland habitats, highly productive farmland, existing woodland, deep peat soils, and towns and cities**.[3]

We have identified the areas, shown on the map below (Figure 1), where significant new woodlands could potentially be created. Within these areas, we looked at soil type to assess the climate risks of woodland creation. Higher-risk organo-mineral soils, rich in carbon, are shown in red. Although new woodlands could be created here, there is a danger that we could lose more carbon from the soil than new trees would absorb, at least over the first few

[1] https://www.theccc.org.uk/publication/sixth-carbon-budget/
[2] Methodology can be found here
[3] Trees can and should be planted in urban and peri-urban areas for many co-benefits, but minimal sequestration potential and hectarage meant this type of planting was excluded from our analysis

decades. Mineral soils, shown in blue, have lower levels of carbon, so new woodland expansion here poses a lower risk for the climate.

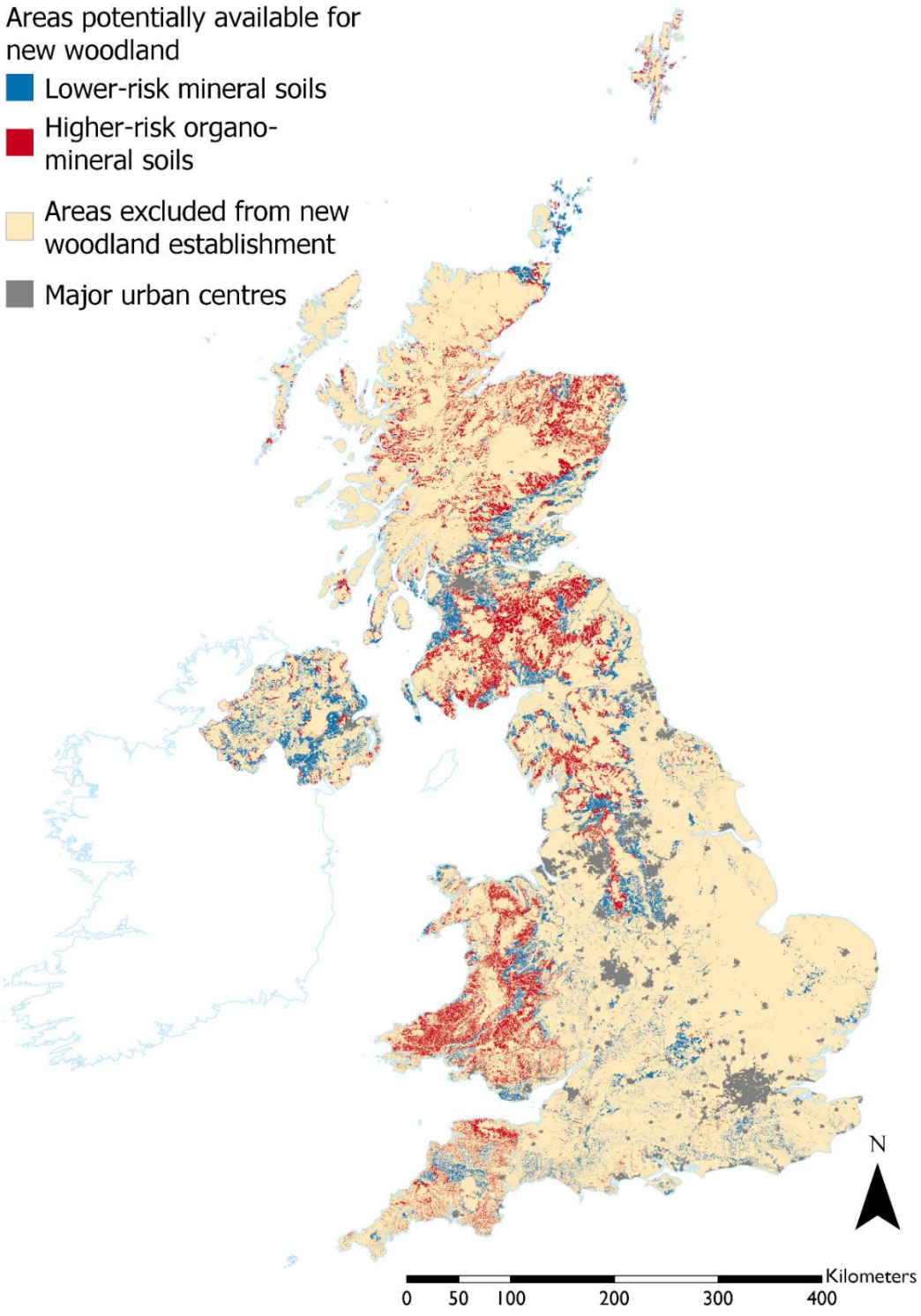

Figure 1: Woodland opportunity map, based on climate risk from soils.

There is just enough lower-risk soil in the UK to accommodate the CCC's most ambitious woodland expansion targets. However, ensuring that carbon emissions from higher-risk soils are minimised during woodland expansion will require a strategic, UK-wide approach to identify the best places for new woodlands. Currently woodland expansion is unbalanced across the four nations and often focused on these higher-risk soils in Scotland and Northern England. This could lead to carbon emissions and nature degradation.

Our woodland opportunity map is **indicative, rather than prescriptive**: it shows where potential exists for woodland expansion after removing inappropriate areas. Full and proper surveys for soil suitability and sensitive species will always be required to determine if tree planting is appropriate.

It's important to remember that woodland expansion can have a **major impact on valuable priority species**. We haven't excluded the ranges of priority species from these maps due to data constraints. It is also the case that new woodlands can be created in areas that are also valuable for species such as curlew, but they need to be the right sort of woodland – native, low density and appropriately sited. More plantation forestry in these areas will further squeeze these declining species, and given the prevalence of higher-risk organo-mineral soils in areas important for breeding waders, such as the Southern Uplands and Pennines, could lead to negative outcomes for climate change too.

Breeding waders and new woodlands

The UK is home to globally important species of waders such as curlew. Inappropriate woodland creation is one of the main reasons for their decline in the uplands, due to direct habitat loss and high rates of predation. However, new woodlands can be incorporated into our uplands, if we adopt a focus on native, low density planting in the right places. This will often be down to field level decisions, and therefore highlights the need for better data, and timely site surveys when planning all new woodlands in these areas.

New woodland emerging at RSPB Geltsdale in the North Pennines, with breeding wader habitat (in-bye grassland) to the right of the image

Species must be considered as a top priority in decision making about where new woodlands go, informed by site surveys, better data and a robust approach to Environmental Impact Assessment (EIA) regulations.

We must avoid damaging planting on peat

We know we need to **avoid planting on deep peat** - indeed current forestry practice includes a presumption against new planting in these sites. This is because planting in such places can result in an **overall release of carbon from the peat**. Similarly, if planting on organo-mineral soils[4] results in losses of carbon that are only balanced by sequestration

[4] Organo-mineral soils are defined here as "not deep peat histosols, but soils with substantial proportion of organic matter". These include so-called 'shallow peats', which will often not be appropriate for new woodlands, through to predominantly mineral soils that may be suitable for woodland.

after, for example, several decades, the effect in the short-term is to increase emissions at a time when we are trying to achieve net zero emissions. Site assessments should always accurately account for carbon and nature outcomes.

The evidence base on the net carbon balance of planting on shallow peat sites is still expanding, but it is a vital issue when considering where to plant trees. Some types of woodland, for example through natural regeneration, may be appropriate on shallow peat soils, although this may still entail a loss of carbon. However, in many instances, shallow peats are hydrologically linked to deep peats, and the drainage and cultivation often associated with plantation forestry can lead to significant carbon emissions. Determining whether shallow peats can be included in woodland creation schemes will therefore come down to on site surveys, but we would encourage a presumption against in most cases.

This reinforces the need for a strategic approach, to balance our needs from the land whilst securing benefits for climate change mitigation and nature.

Coherent networks to help revive nature

Many species and habitats can benefit from woodland expansion, but only if this is carefully thought out and well implemented. What the map shows is that we need to think carefully about where we expand our woodlands, and if **well designed we can meet multiple objectives relating to climate and nature**. Failing to consider both carbon and nature when planning woodland expansion would be a missed opportunity.

Priority species: Whinchat

Inappropriate planting on semi-natural grasslands could squeeze whinchat out. In these areas, promoting natural regeneration as part of a mosaic of habitats to maximise early successional woodland edge may help mitigate this.

We need a new **coherent network of woodlands and other habitats across the country**, for carbon, nature and wellbeing. Joining up habitats is key: important species including willow tit and marsh tit need good habitat connectivity to be able to move through the landscape and access different woodland patches. Pied flycatcher, wood warbler, spotted flycatcher, and heath fritillary will all benefit from planning woodlands for nature, where new woodland extends, buffers and protects existing woodland.

These networks must also protect and restore a mosaic of valuable open habitats such as heathland, peat bog, and species rich grassland.

What sort of woodlands would we like to see?

A rush to take advantage of government-funded tree planting schemes **could result in damage to climate and nature**. It is crucial to avoid a scramble to plant trees with negative consequences for nature, climate and the wider landscape. We therefore examined how different woodland types performed for carbon.

We found that **semi-natural woodlands managed for conservation can actually store more carbon over 100 years than Sitka spruce plantations under standard productive management (Figure 2)**.

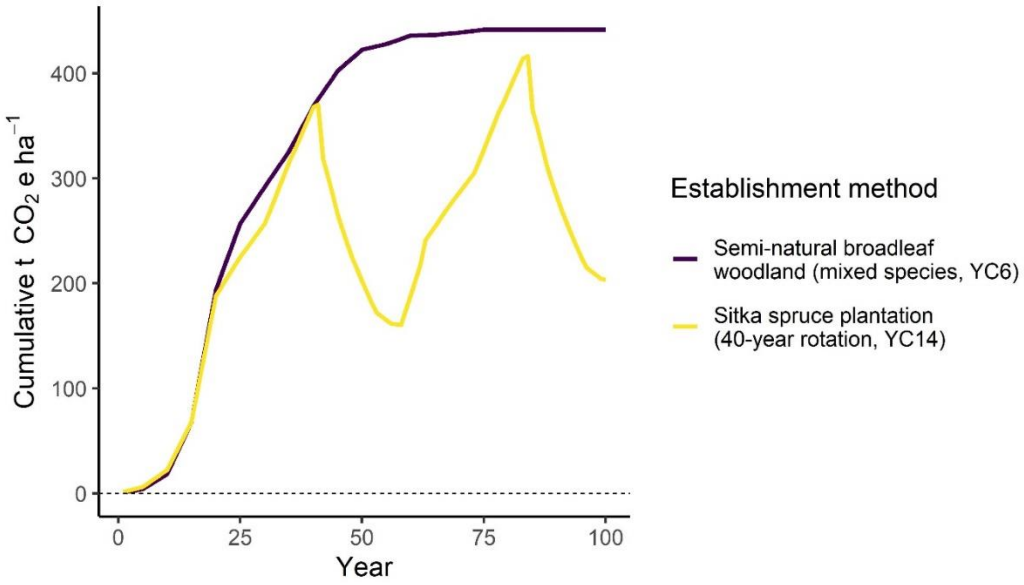

Figure 2: Comparison of mixed broadleaf vs. Sitka spruce, cumulative CO_2e sequestration per hectare over 100 years

The amount of carbon that different types of woodlands remove from the atmosphere depends on what soils the woodlands are created on, the establishment techniques used, and the ways that woodlands are managed. Our assumptions follow widely applied approaches, explained in our methods document.[5]

This comparison shows the long-term value of native woodland for climate change mitigation. Although forestry and timber production is important, and commercial forests can provide benefits for wildlife, it is important that any new woodland justified on carbon grounds delivers genuine benefits.

Tree planting as a 'nature-based climate solution'

We need to plant more trees, but this analysis shows that we need to think carefully about what we plant and how and where we plant them in order to maximise the benefits.

We do not believe that conventional commercial forestry dominated by Sitka spruce maximises the benefits for both carbon and nature. **True nature-based solutions must prioritise nature**: with a balance of rich, biodiverse native woodlands, and well-managed, sustainable forestry to meet our needs.

When we plan significant long-term changes in the way we use our land, like woodland expansion, they must deliver the whole range of potential benefits for nature, climate, and people.

[5] Methodology can be found here

Woodland creation must follow nature-based solutions principles including:

1. The protection and/or restoration of a wide range of naturally occurring ecosystems on land and in the sea.
2. Sustaining, enhancing and supporting biodiversity.

Policy recommendations

A strategic approach to woodland expansion

- Ensure the 'right tree in the right place', undertaking mapping and environmental assessments, including at the site level, to protect species, habitats and soil carbon and maximise the benefits of new woodlands.
- Embed woodland expansion plans in overall objectives for nature, contributing to a network of diverse and connected habitats

Prioritise native woodland

- Focus public money on expanding native woodland habitats to secure multiple benefits for nature, climate and people
- Provide long-term funding for restoration and enhancement of existing habitats, including Ancient and Semi-Natural Woodlands, woodland protected sites, and open habitats.

Protect our peat

- Continue to prevent tree planting on deep peat and restore afforested peatlands
- Only undertake tree planting on organo-mineral soils such as shallow peat if nature and carbon benefits can be demonstrated

High standards for all woodlands

- Enhance the UK Forestry Standard to maximise biodiversity benefits in commercial forestry for timber, nature and climate outcomes and get more woodlands into the UK Woodland Assurance Standard.[6]
- Take a robust approach to implementing environmental regulations and consultation to ensure woodland expansion delivers genuine benefits for climate and nature.

For more information, contact: Neil Douglas neil.douglas@rspb.org.uk

[6] The UK Woodland Assurance standard is an independent certification standard for verifying sustainable woodland management in the UK used for Forest Stewardship Council and the Programme for the Endorsement of Forest Certification.

Annex – Analysis of Climate Change Committee woodland creation scenarios

The Climate Change Committee recently published its 6th Carbon Budget, including updated woodland creation scenarios. A welcome development was a greater emphasis in some of these scenarios on the role that woodland can play to recover nature, as well as mitigate climate change. These scenarios are summarised in Table 1 below.

Table 1 – CCC woodland creation scenarios[7]

Scenario	Broadleaves : Conifer ratio	% open ground	Total area required (ha)
Headwinds	~50:50	15%	897,000
Balanced Net Zero	67:33 W & NI 80:20 England 50:50 Scotland	15%	1,431,750
Widespread Engagement		20%	1,992,042
Widespread Innovation	33:67 E, W & NI 25:75 Scotland	10%	1,438,250
Tailwinds	~50:50	10%	1,909,040

The Balanced Net Zero pathway is the CCC's central scenario. Of these, the RSPB supports the Widespread Engagement scenario given its greater focus on biodiversity alongside climate change mitigation.

Table 2 below sets the land identified in the RSPB analysis as potentially available for woodland creation against the highest total land required by the these CCC scenarios ("Widespread Engagement").

Country	Highest CCC ambition	Potential area, lower climate risk (ha)	Potential area, higher climate risk (ha)
UK	1,992,042	2,059,105	2,588,716
Scotland		549,595	1,358,122
Wales		161,075	606,243
England		1,029,076	553,248
Northern Ireland		319,359	71,103

The CCC do not provide UK country breakdowns for their woodland creation scenarios. However, looking at the balance of lower and higher risk areas based on our analysis, it is clear that a higher proportion of the total in Scotland and Wales is weighted toward higher climate risk, organo-mineral soils. This has significant implications for woodland creation plans, reinforcing the need to take a strategic approach to new woodland creation. It is undoubtedly the case that the economics of land values (often lower in areas dominated by these higher-risk soils) and existing forestry infrastructure is already driving new planting into these higher risk areas in southern Scotland, northern England and parts of Wales.

[7] These have been taken from the 6th Carbon Budget methodology report