Forestry Commission

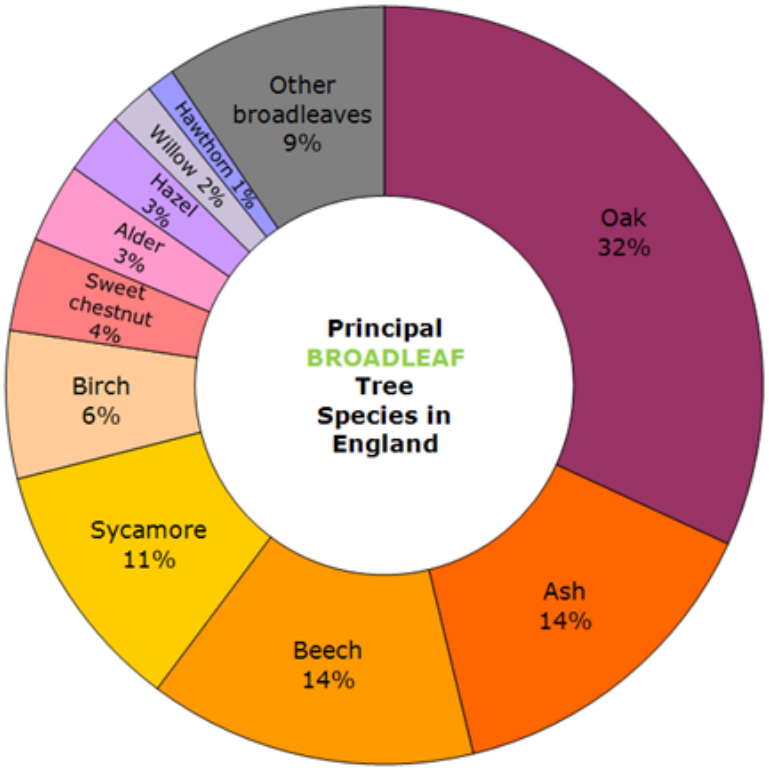
Managing England's woodlands in a climate emergency

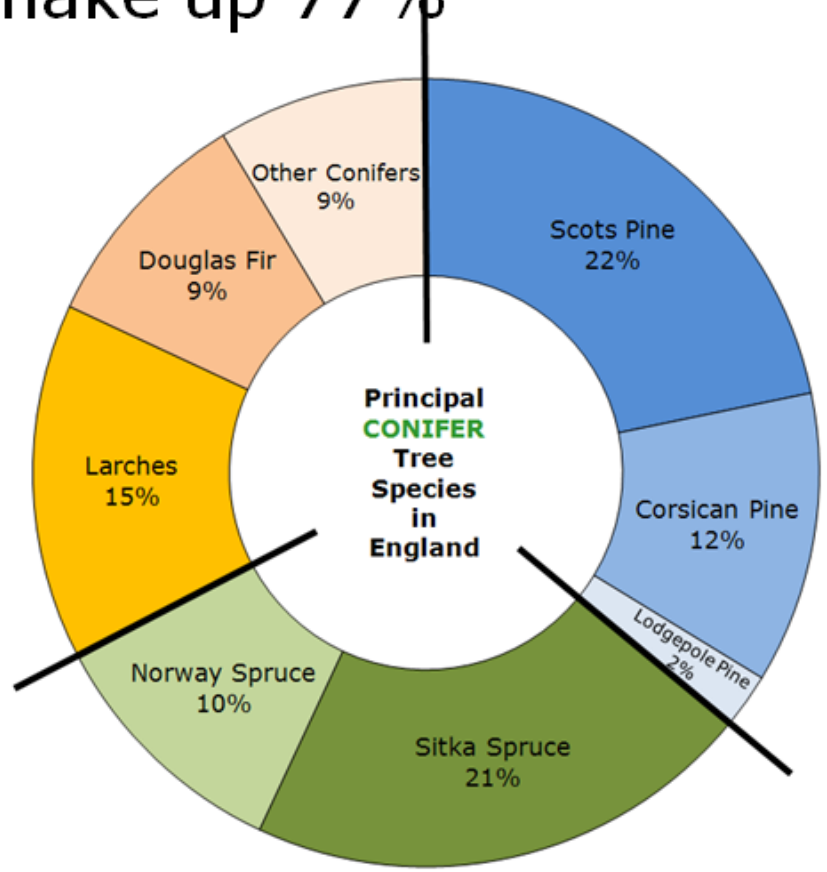
How the Forestry sector needs to respond

John Weir FICFor

Limited Species

- England: 1/3rd conifer – 6 species make up 89%
- Broadleaves – 5 species make up 77%





Species selection help

Forest Research

Enter Grid Reference (e.g. NT090950) Go Select decision support tool: Ecological Site Classification (Tree

Ecological Site Classification : Amend site/management variables below then click on map for species suitability analysis.

Input vegetation survey

Soil properties Input soil survey

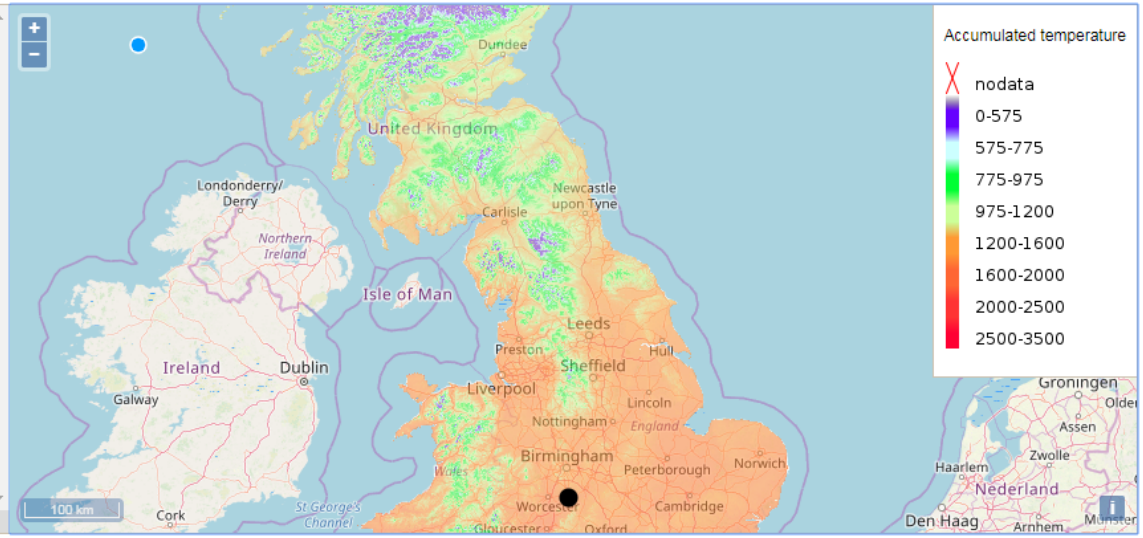
Soil Moisture Regime (SMR):
Default (modelled data)

Soil Nutrient Regime (SNR):
Default (modelled data)

Site Management [+/-]

Options [+/-]

Update Results



Download results as a CSV file | Download results as a PDF file (numeric) | Download results as a PDF file (symbols)

Adjustments	Eastings(m)	Northings(m)	Site Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser
Site defaults	406952	253448	SP069534	Baseline climate 1961-1990	Warm - Sheltered - Moist	All species	No brash present	No drainage installed	No fertiliser

Site Description

The site has a warm, sheltered and moist climate. The soils are moist moisture status and rich nutrient status. Coarse branching and poor stem form may affect certain pine species and birch due to the presence of rich

Modifications	Accumulated Temperature(AT)?	Continentality(CT)?	Exposure(DAMS) ?	Moisture Deficit (MD)?	Soil Moisture Regime (SMR) ?	Soil Nutrient Regime(SNR) ?
None	1762	10	12	176	4(Moist)	4(Rich)
Final	1762	10	12	176	4(Moist)	4(Rich)

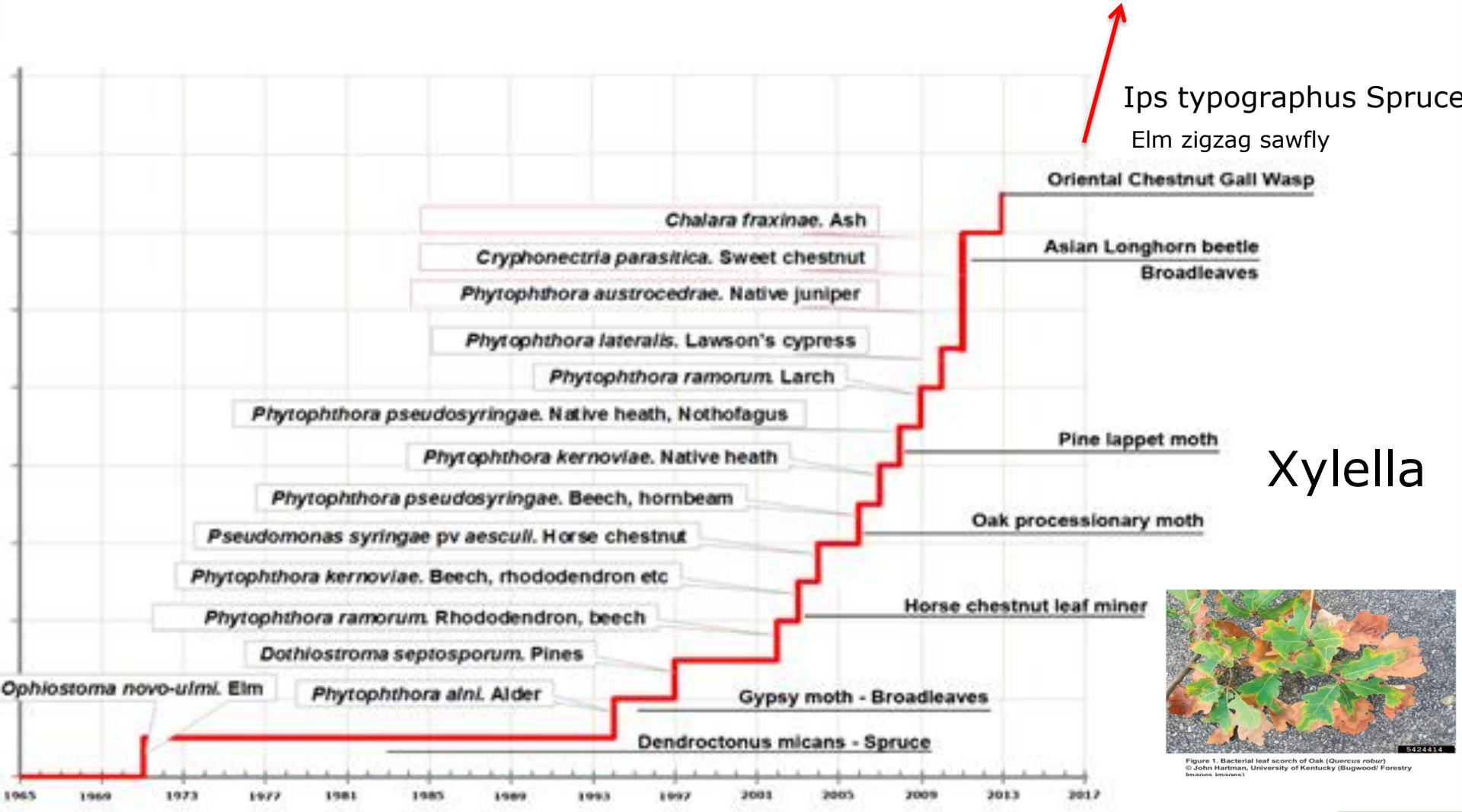
Suitability key Very Suitable (0.75-1.00) Suitable (0.50-0.74) Marginal (0.30-0.49) Unsuitable (0.0-0.29)

[species name] = species with pest/disease constraint

Common name	Species Code	Suitability		YC	Lim	AT	CT	DAMS	MD	SMR	SNR	Suit.	AT	CT	DAMS	MD	SMR	SNR	Version (Rating)	Suit. Charts
		Ecological	Timber																	
Corsican pine	[CP]	0.92	0.92	18	SMR	1	1	1	1	0.92	1								3.3(A)	download chart(csv)
Lodgepole pine	[LP]	1	1	14	AT5	1	1	1	1	1	1								3.1(A)	download chart(csv)
Macedonian pine	MCP	1	1	14	AT5	1	1	1	1	1	1								3.1(C)	download chart(csv)
Maritime pine	MAP	0.69	0.67	9	SMR	0.97	0.74	0.96	1	0.69	1								3.1(C)	download chart(csv)
Monterey/Radiata pine	RAP	0.65	0.48	10	CT	0.74	0.65	1	1	0.84	0.97								3(C)	download chart(csv)
Scots pine	SP	0.93	0.93	13	SMR	1	1	0.98	1	0.93	1								3.3(A)	download chart(csv)
Weymouth pine	WEP	0.5	0.5	7	SMR	1	1	0.96	0.83	0.5	1								3(C)	download chart(csv)
Norway spruce	NS	0.94	0.94	22	MD	1	0.98	0.96	0.94	1	1								3.3(A)	download chart(csv)
Oriental spruce	ORS	0.9	0.9	20	DAMS	1	1	0.9	1	0.99	1								3(C)	download chart(csv)
Serbian spruce	OMS	0.86	0.86	19	DAMS	1	1	0.86	1	0.97	1								3(B)	download chart(csv)
Sitka spruce	SS	0.6	0.6	17	MD	1	0.86	1	0.6	1	1								3.4(A)	download chart(csv)
Sitka spruce (Imp.)	Imp.SS	0.6	0.6	18	MD	1	0.86	1	0.6	1	1								3.4(A)	download chart(csv)
Douglas fir	DF	0.7	0.7	18	SMR	1	1	0.87	1	0.7	1								3.1(A)	download chart(csv)
Hybrid larch	[HL]	0.91	0.91	14	MD	1	1	1	0.91	0.99	1								3(A)	download chart(csv)
Japanese larch	[JL]	0.68	0.68	9	MD	1	0.82	0.96	0.68	1	1								3(A)	download chart(csv)
European larch	[EL]	0.72	0.72	9	SMR	1	1	0.84	0.87	0.72	1								3(A)	download chart(csv)
Western red cedar	RC	0.85	0.85	20	DAMS	1	0.87	0.85	1	1	1								3.1(A)	download chart(csv)
Japanese red cedar	JCR	0.67	0.67	16	MD	1	0.8	0.77	0.67	1	1								3(B)	download chart(csv)
European silver fir	ESF	0.81	0.81	18	MD	1	1	0.88	0.81	1	1								3(B)	download chart(csv)
Grand fir	GF	0.65	0.65	20	CT	1	0.65	0.86	0.87	1	1								3(A)	download chart(csv)
Noble Fir	NF	0.25	0.25	6	MD	1	0.65	1	0.25	1	1								3(A)	download chart(csv)

Pests and diseases

Xylella, Long horn beetles, Spruce bark beetles, Pine processionary moth, Birch borer, Pine nematode, etc, etc.



Xylella

Figure 1. Bacterial leaf scorch of Oak (*Quercus robur*)
© John Hartman, University of Kentucky (Bugwood/ Forestry Images image)

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Biosecurity

Non Government Organisations

Action Plan for Climate Change Adaptation of forests, woods and trees in England

Climate change is having far-reaching impacts on the health of our trees and woods. Forest,

UK Government

Tree health resilience strategy 2018

This strategy explains how the government will work with others to protect England's tree population from pest and disease threats.

GOV.UK

UK Government

UK Plant Health Information Portal

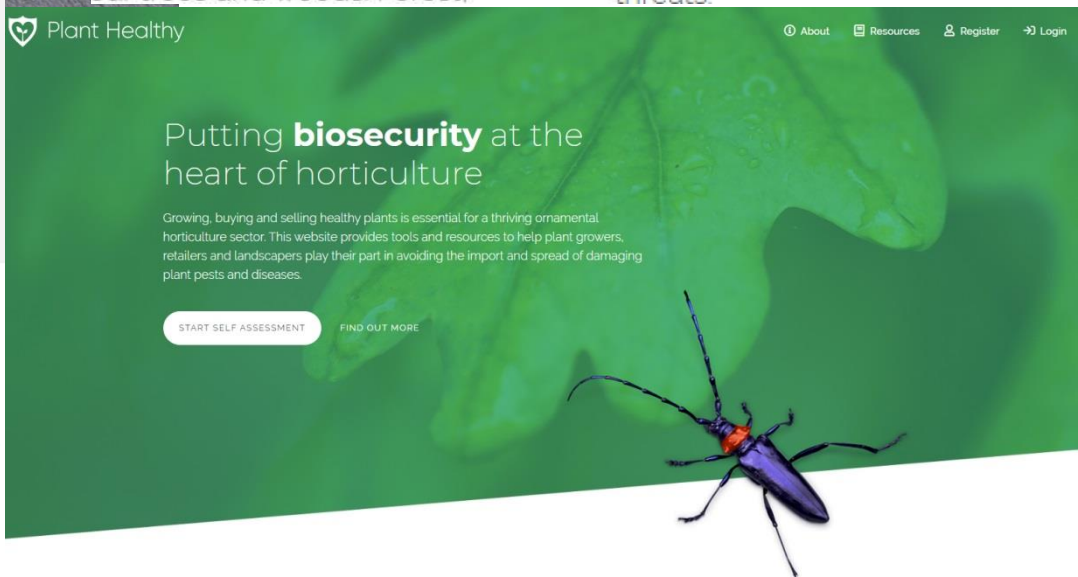
An online hub for plant health information, data and resources.

Department for Environment Food & Rural Affairs

UK Government

UK Plant Health Risk Register

An online register that records and rates risks to UK crops, trees, gardens and ecosystems from plant pests and pathogens.



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Increasing mammal











Could we? Dare we?

Do we know enough about what the impacts could be?

Would society accept a future need to cull?

Forestry Commission

And then Climate Change

England's woodlands and forests have **developed in a stable and predictable climate.**

For the past 8,500 years, the **English Channel** has acted as a **natural barrier** to species migration.

Winters are predicted to become **wetter, and summers drier,** with more **frequent and severe** periods of summer drought and intense rainfall events.

These changes are predicted to be **more severe** in the east and south.

With the current projections[4], global warming is projected to **increase by a further degree** within the next two decades. However, global temperatures could **rise to 4°C** above pre-industrial levels by the end of the century, and summer maximum temperatures could **rise by up to 10°C** in parts of England.

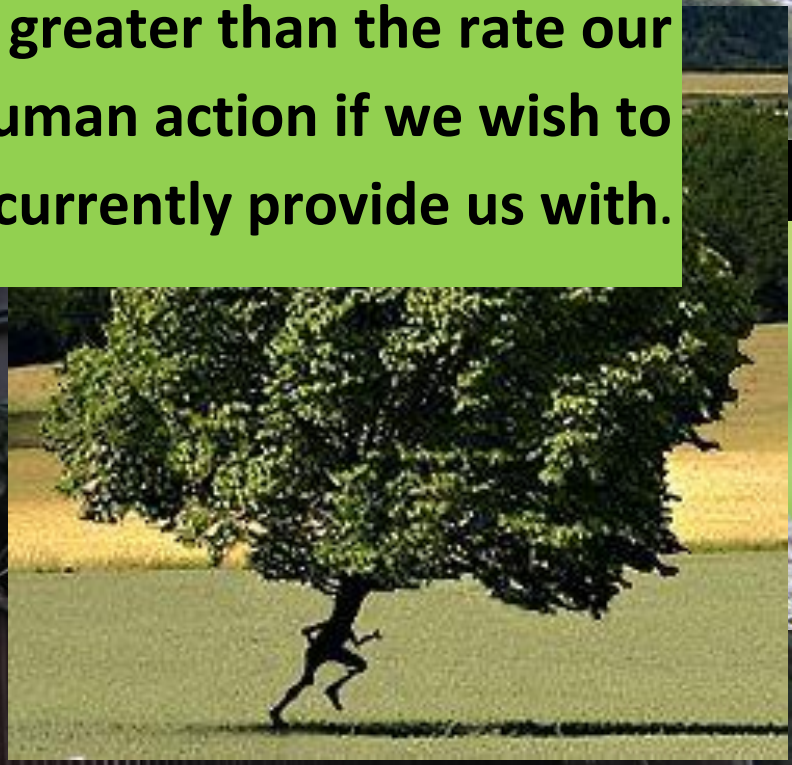
Because the earth's climate system responds slowly to past emissions, **we are locked into a level of climate change** over the coming decades, regardless of future emissions.

Global emissions are currently tracking close to **some of the more extreme projections** that have been published.

It is probable that the rate of change is **greater than what our woodlands can adapt to** without human action.

The speed of climate change

The speed of this change in climate is unprecedented since at least the last ice age and is probably greater than the rate our woodlands can adapt without human action if we wish to retain the ecosystem services they currently provide us with.



Climate Matching

TREES 4 FUTURE

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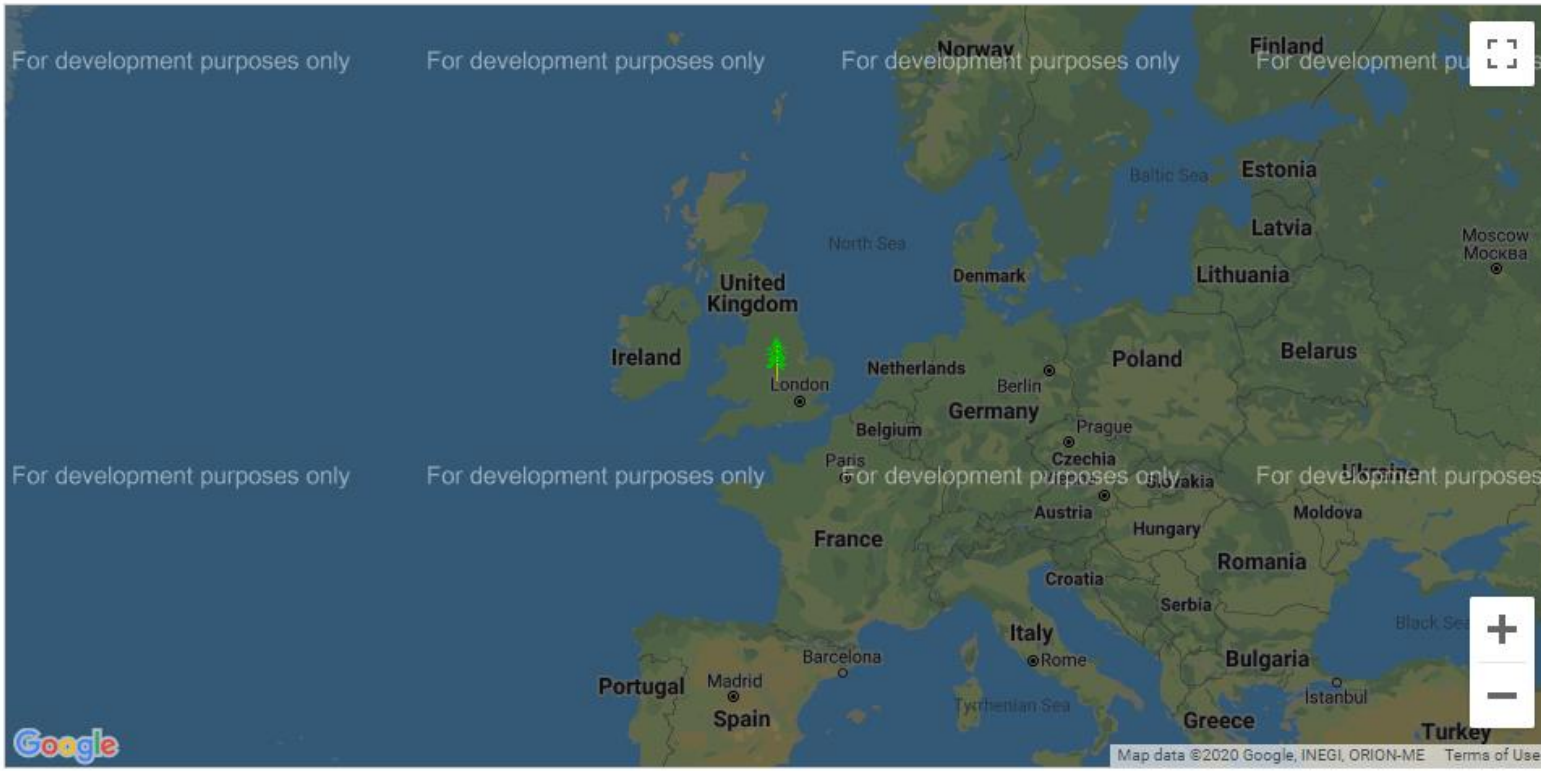
Trees4Future in brief

Theme: Research infrastructures for forestry research
Duration: 4 years
Budget: app. 9 Mill EUR
Funder: EU 7th Framework Programme (FP7)
Partners: 28 organisations

Download the T4F brochure (pdf)



Options for the tool:

Lon: -1.313		Calculate!
Lat: 52.017	☐ Growing season	
Model:	SRES	Year
◉ Baseline	◉ A1B	◉ base
○ HadCM3	○ A2	○ 2050
○ ECHAM5	○ B1	○ 2080

Layers:

☐ Available water content

Moisture deficit ◉ None
Base: ○ MD200 ○ MD250 ○ MD300
2050: ○ MD200 ○ MD250 ○ MD300
2080: ○ MD200 ○ MD250 ○ MD300

nothing to download
Available water capacity
The available water capacity (AWC) layers (*Panagos et al 2012*) are based on

Climate Matching Curr

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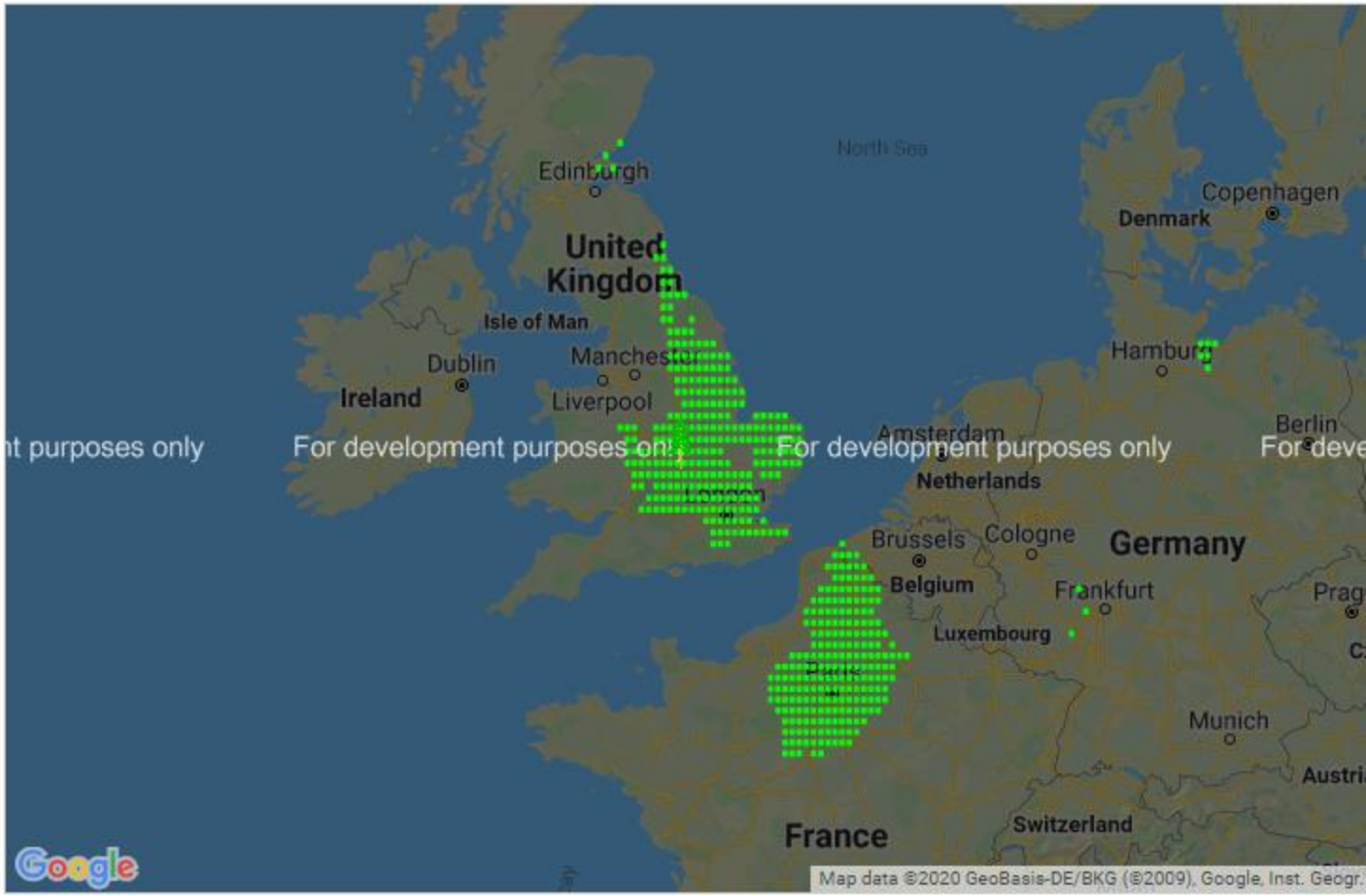

Options for the tool:

Layers:

Climate Matching Mid Century

TREES 4 FUTURE

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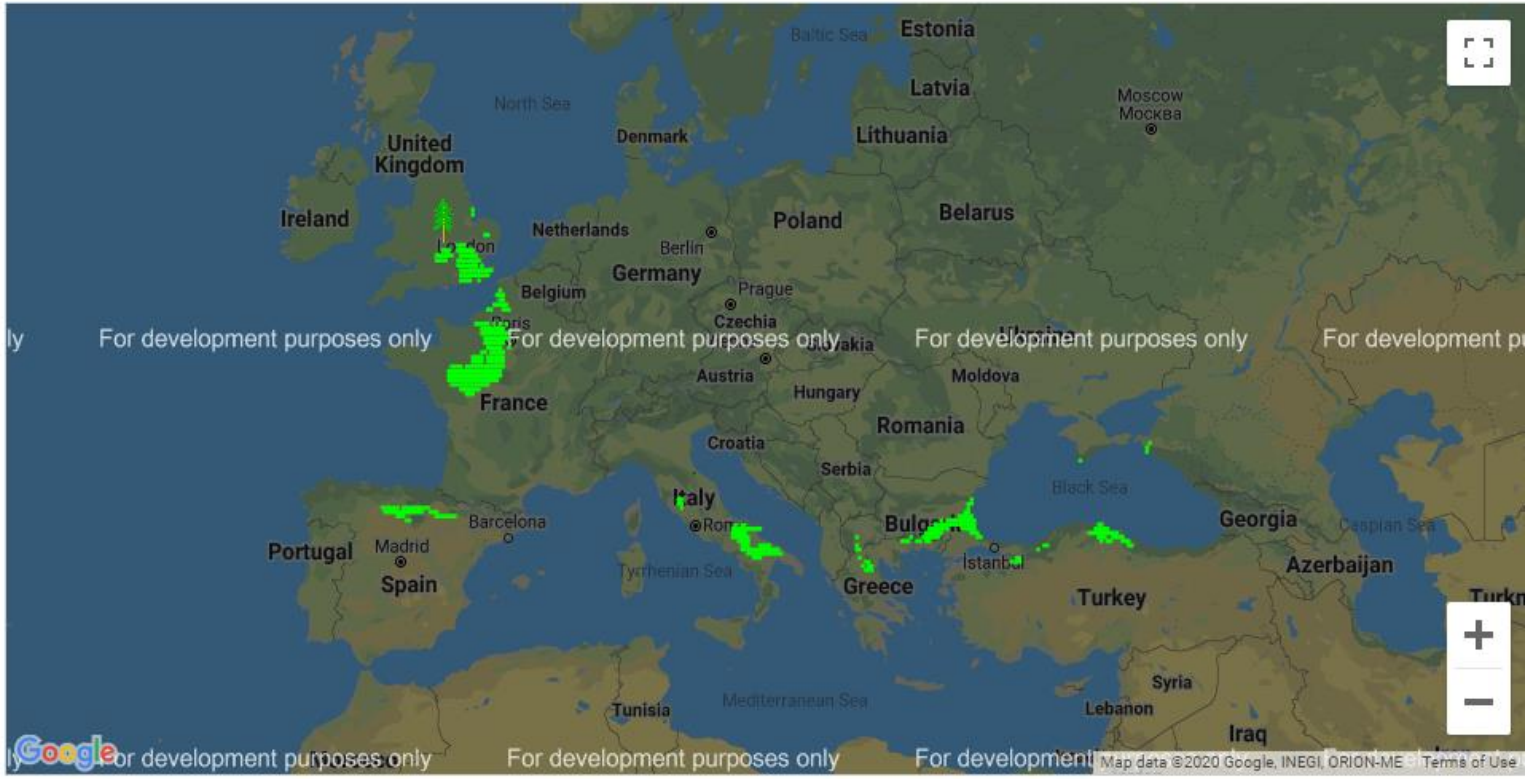


Options for the tool:

Lon: -1.313		Calculate!
Lat: 52.017	Growing season	
Model:	SRES	Year

Layers:

Available water content

Moisture deficit None
Base: MD200 MD250 MD300
2050: MD200 MD250 MD300
2080: MD200 MD250 MD300

Results for the point: *-1.313 , 52.017*
Model: *HadCM3*

HadCM3 A1B 2050

Thinking outside the pot

Native distribution of oak

Forest Research "Seed from central and eastern European sources is not recommended and it would be better to delay planting rather than use such material".

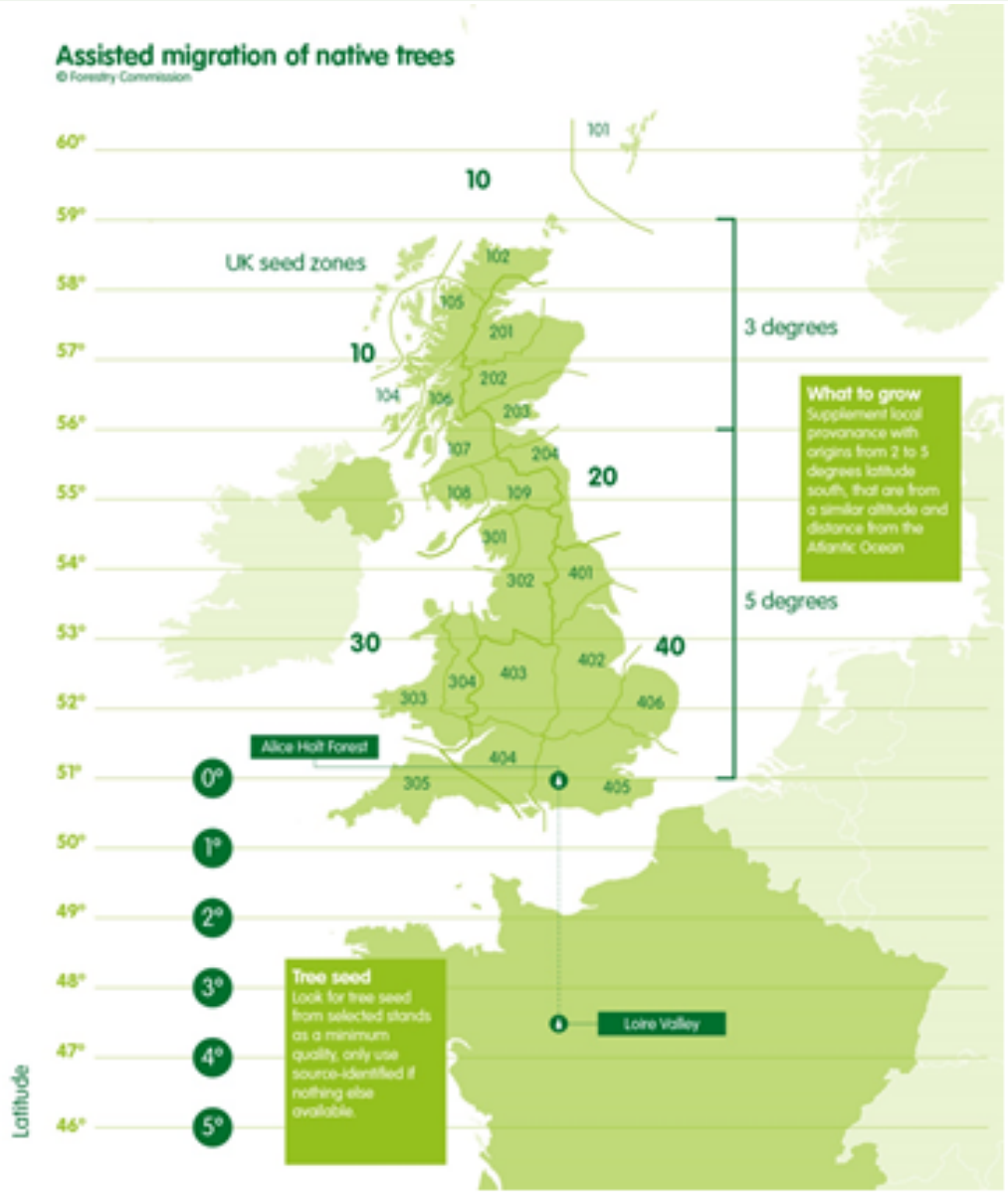
Current tree species of Europe including plantations

Quercus robur & Quercus petraea

Migration route post last ice age

Grown in Britain

Genetics within species



For all new woodlands it is vital that material is drawn from a broad genetic base.

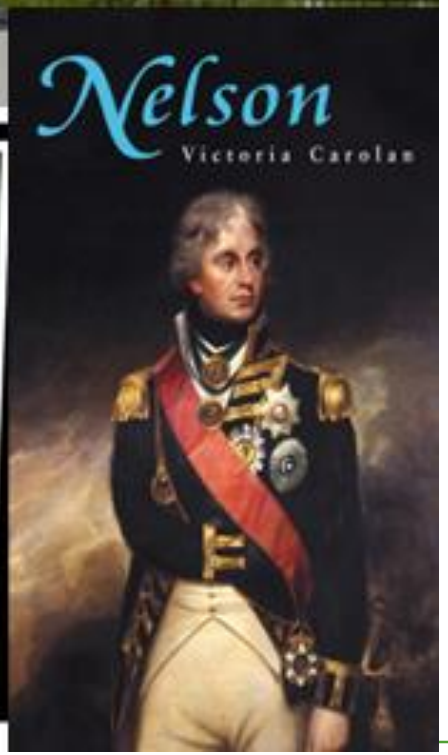
When planting native species and native woodlands it is generally best to use well-adapted local or regional origins from similar elevations.

Consideration can also be given to planting a proportion of other origins from areas with conditions that are well matched to the predicted future climate at the planting site, in situations where climate change projections indicate that it may be necessary to do so.

Advice on suitable origins for planting of native species can be obtained from country-specific policies and guidance.

With our past history is the tree native and local?

"Get your hands off my husband."



Climate Matching End of Century

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Trees4Future in brief

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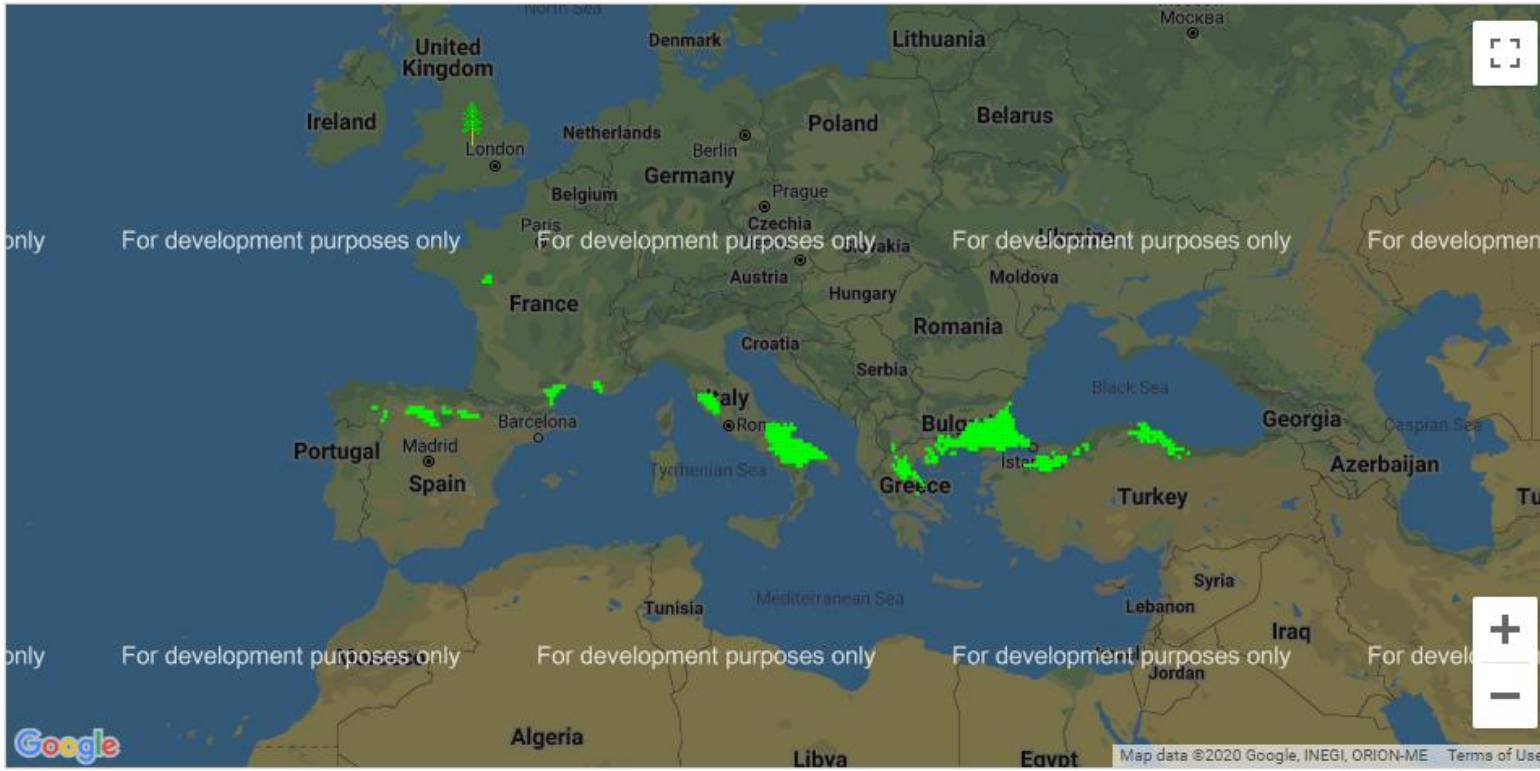
Download the T4F brochure (pdf)



Options for the tool:

Lon: -1.313		Calculate!
Lat: 52.017	Growing season	
Model:	SRES	Year

Layers:

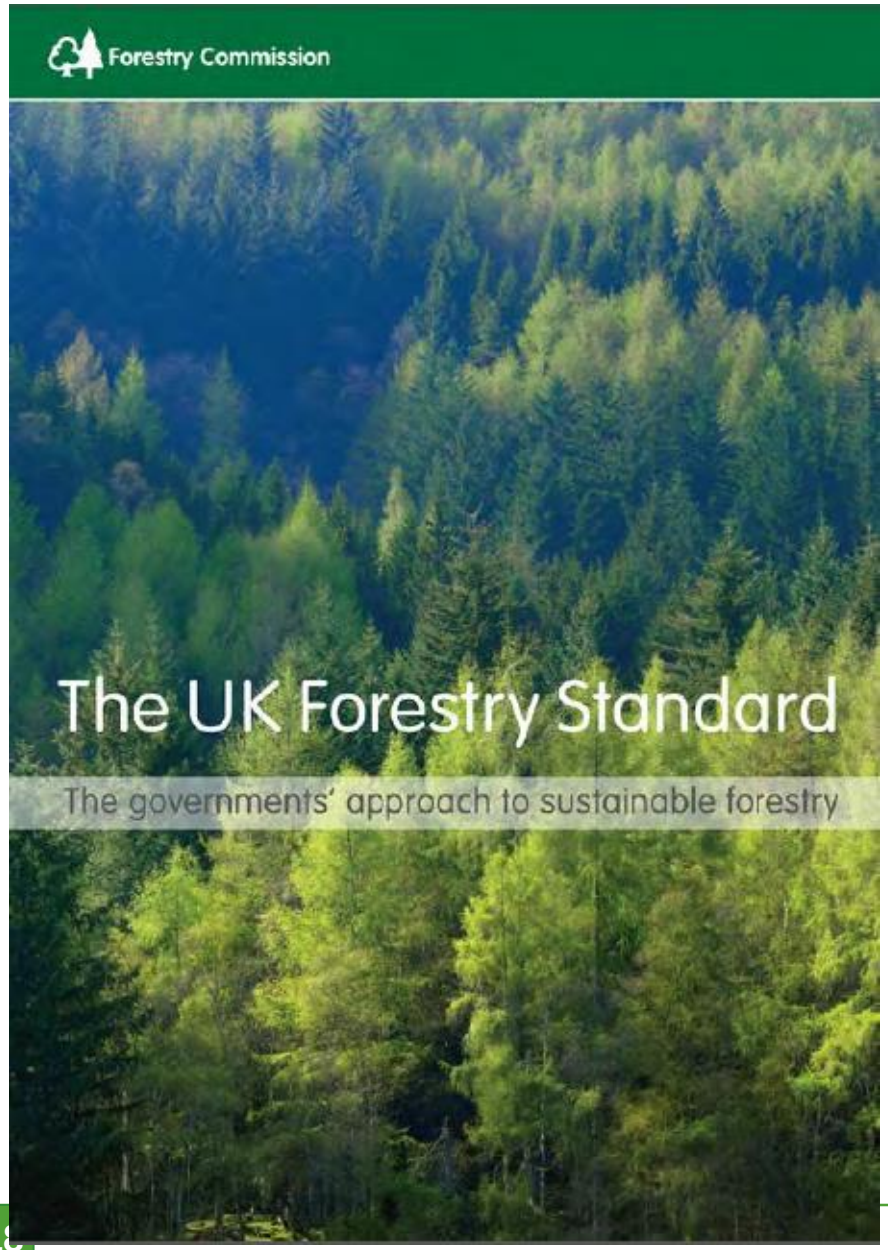
Awailable water content

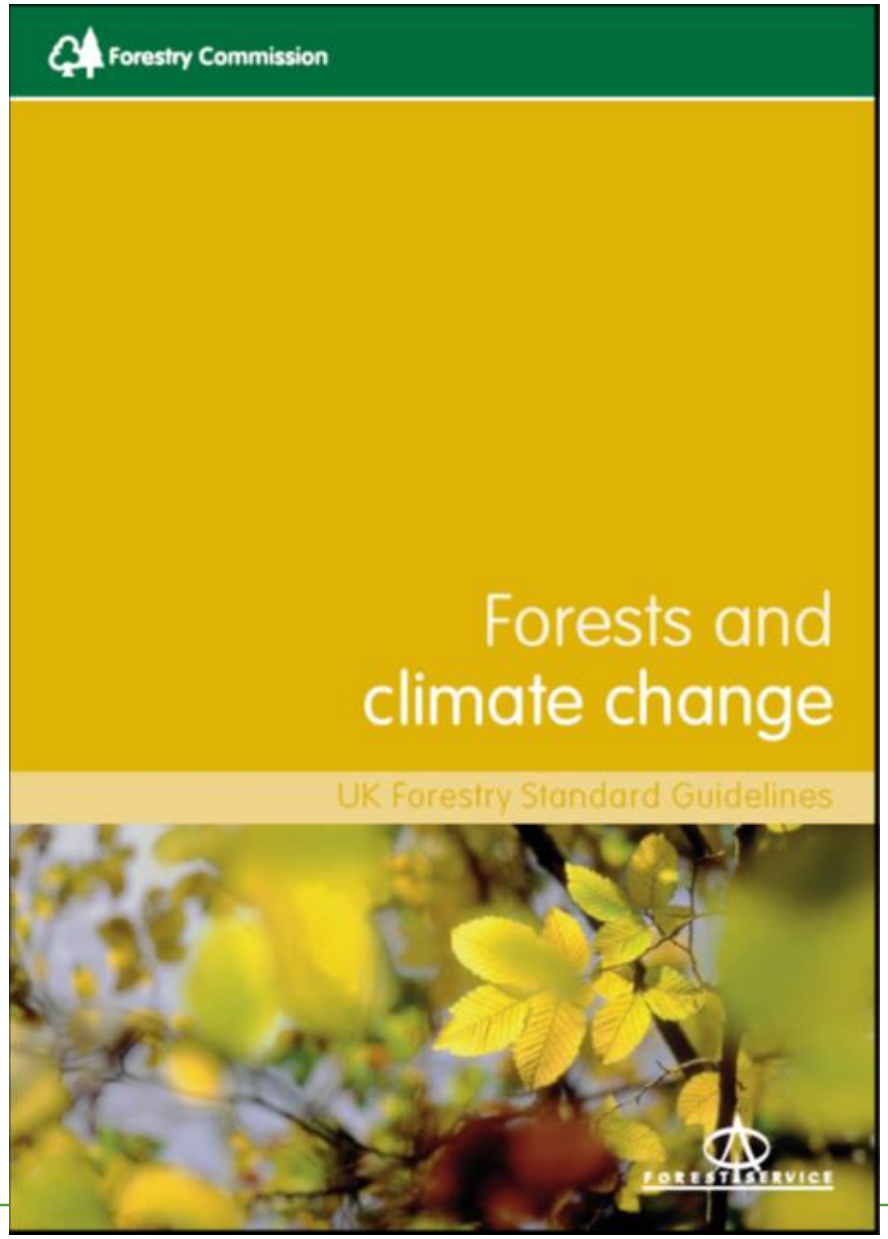
Moisture deficit None
Base: MD200 MD250 MD300
2050: MD200 MD250 MD300
2080: MD200 MD250 MD300

Results for the point: *-1.313 , 52.017*
Model: *HadCM3*
Year: *2080*

HadCM3 A1B 2080

The UKFS


Forestry Commission
The UK Forestry Standard
The governments' approach to sustainable forestry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Forests and climate change
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Forestry Commission

2019 Position Statement

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Correspondence

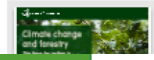
Climate change and forestry: position statement

Read the Forestry Commission's statement on planting resilient trees in response to the climate emergency and get practical advice for landowners.

Published 5 September 2019
Last updated 5 November 2019 — see all updates
From: Forestry Commission

Applies to: **England (see publications for Northern Ireland, Scotland, and Wales)**

Documents



Managing woodland: position statement

Forestry Commission

There is now a convincing body of evidence that we are facing a climate emergency. Planting and managing trees, forests and woodlands so that they are fit for the future must be part of our nation's response.

Growing trees removes carbon dioxide from the air, and stores the carbon in wood products throughout their life. Trees can also help to manage the risk of flooding, and provide shade and cooling benefits. They are a renewable source of energy today, and a sustainable raw material for the future bio-economy.

But trees can only help reduce the negative impacts of a changing climate if they are resilient to those challenges themselves. As one of many signatories of the **Climate Change Accord**, we know that we must take urgent action.

Our action involves making significant changes to the species composition, structure and management of our woodlands now, to give them the best chance to survive and thrive in 50 years' time, when we know our climate will be quite different.

Many species that are currently less common in British woodlands may be better adapted to future conditions. That is why we are planting a wider range of tree species in the nation's forests. We also need to plan for some species suffering more from tree health issues, as the changing climate makes them more vulnerable, or the conditions more favourable, to pests and diseases.

We recognise that different woodland management objectives require different adaptation strategies and timescales. Adapting our woodlands to the future climate cannot be a one-size-fits-all approach, and diversity will be needed at the landscape level, as well as within woodlands, to mitigate risks.

The Forestry Commission has a key role to play, and we will continue to work closely with our Climate Change Action Plan partners and all parts of the tree, woods and forestry sector to protect our woodlands for future generations.

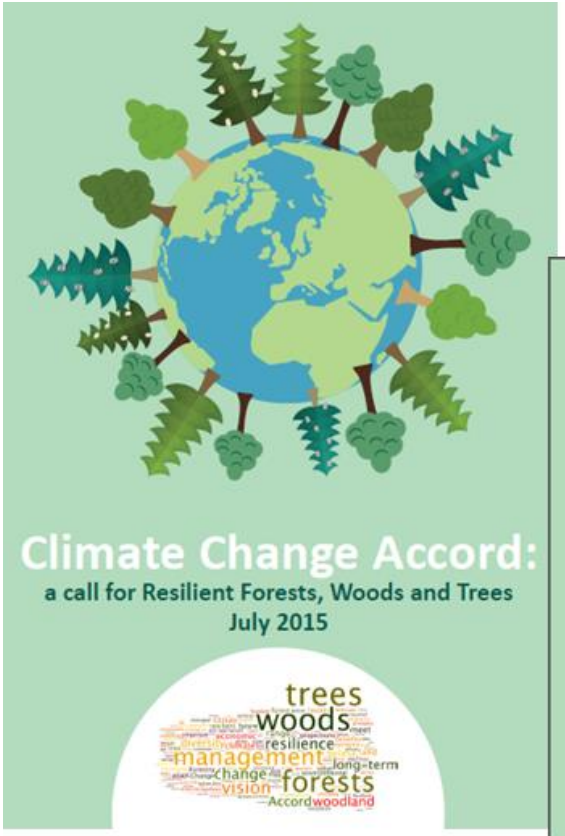
We will:

- Lead by example, making the woodlands we look after more resilient.
- Provide advice and support to landowners and managers so they can make changes now.
- Keep learning through research, monitoring and the exchange of knowledge.

www.gov.uk/forestrycommission
@ForestryComm

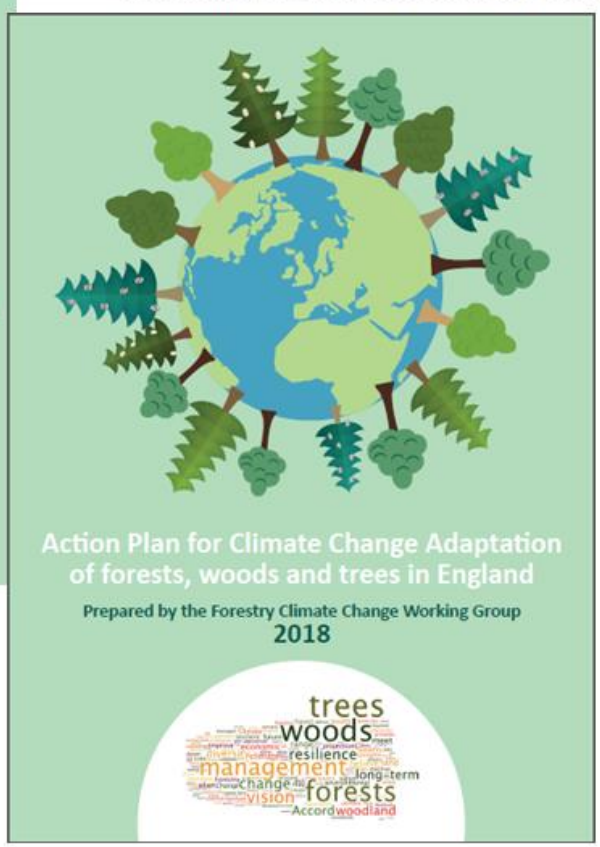
www.gov.uk/government/publications/managing-englands-woodlands-in-a-climate-emergency

Forest Industry Action



Climate Change Accord: a Call for Resilient Forests, Woods and Trees

We believe that it is necessary to act now to provide a secure future for our forests, woods and trees, that significant changes are required to widely-accepted and practiced systems of management to make them resilient, and we are committed to help realise the vision set out in this Accord.



Key issues to be addressed

The action plan is based on 11 issues identified as the major gaps that need to be addressed.

They are

I. Not enough woodland is being planted to enhance resilience at a landscape scale.

II. Lack of management in many woodlands is hindering implementation of adaptation measures e.g. opportunities for natural regeneration (which can assist adaption) are being reduced by deer browsing and the closed canopy structure of many woods.

III. New tree planting is not using sufficient quantities of genetically-diverse and/ or appropriate stock, potentially limiting adaptive potential.

IV. Nurseries are not providing a wide enough range of tree species of sufficient and appropriate genetic diversity.

V. The sector is not embracing contingency planning.

VI. Low level of restocking is hindering implementation of adaptation measures.

VII. Limited uptake of continuous cover approaches to management.

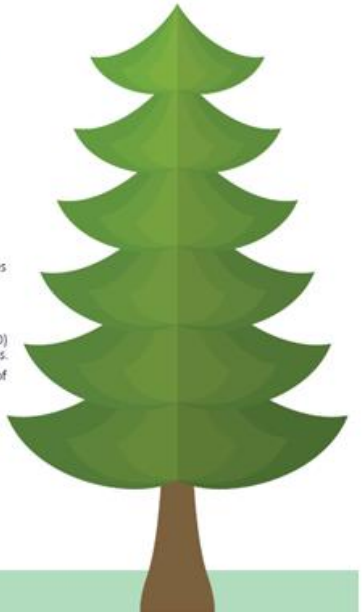
VIII. Forest planning and design is not taking account of climate change impacts and projections.

IX. Lack of clarity on what adaptation measures are available and appropriate.

X. Lack of knowledge sharing of adaptation practices.

XI. Continuous Professional Development (CPD) opportunities difficult to identify and access.

Each action in the plan addresses one or more of these gaps.



Thanks for listening

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@johnweirfc