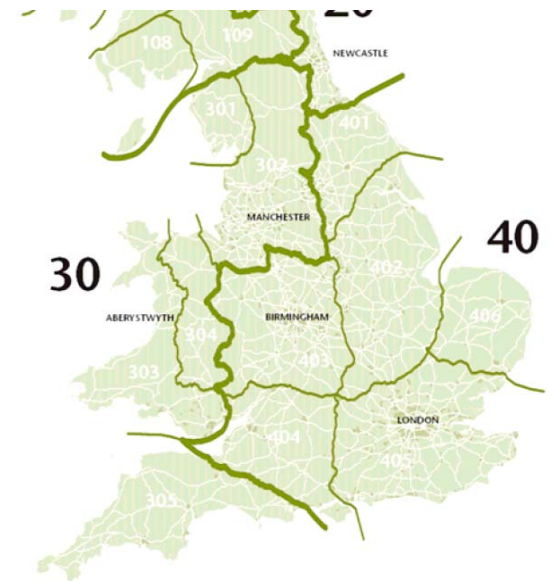


# FEE Pines

## UK provenance zones to determine origin/provenance of seed used

Scots pine	Pinus sylvestris
Lodgepole pine	Pinus contorta
Maritime pine	Pinus pinaster
Macedonian pine	Pinus peuce
Monterey pine	Pinus radiata
Weymouth pine	Pinus strobus



Corsican pine cannot be used because of red band needle blight.

Lodgepole pine is restricted to Kielder and NYM

New pines to be used initially at small operational scale, until more knowledge is gained

	<b>Use as normal where appropriate</b>
	<b>Use, monitor and review</b>
	<b>Do not use</b>



# Scots Pine Category A

## Native range

Native to north Scotland, and widespread in Europe from Scandinavia to central Spain. This wide distribution means that careful thought needs to be given to provenance choice.

## Site requirements

A light demanding pioneer species that grows well on acid to neutral, light soils of low fertility. Is better suited to drier soils but will colonise and grow slowly on peat. Does not tolerate alkaline soils. Will grow vigorously when planted on more fertile sites, but stem form is often poor. The species is frost hardy, drought tolerant and windfirm but suffers from exposure. A traditional afforestation species because of its ability to survive and grow under difficult conditions, and it can be a useful nurse for more demanding species.

## Pests and pathogens

*Heterobasidion annosum* (Fomes) causes root and butt rot. It affects pine plantations growing on mineral soils, and soils of high pH (above 6) present the greatest risk from this disease. Apart from causing decay and root rot, on high risk sites pines of all ages can be killed by *H. annosum*. There are a number of common and potentially serious shoot and needle diseases of Scots pine caused by fungi. These include *Lophodermium*, *Brunchorstia* and, more recently, red band needle blight (*Dothistroma septosporum*). Scots pine can also be affected by *Peridermium* rust resulting in perennial cankers which can distort and girdle branches.

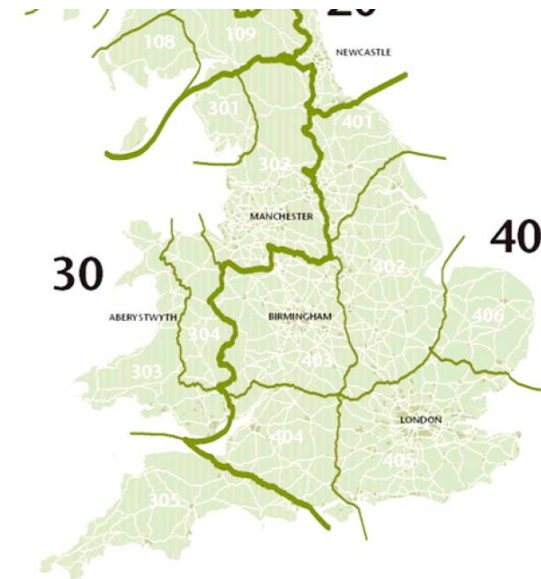
In 2006, pine-tree lappet moth was discovered in Britain. This moth has caused severe defoliation of Scots pine trees on many occasions in Eastern Europe. An initial assessment of the potential impact of the moth in Britain is that it presents a significant threat to the pine forests of northeast Scotland – and further afield if allowed to spread.

The pine processionary moth (*Thaumetopoea pityocampa*) is considered among the most important limiting factors for both growth and survival of pine forests in southern Europe and Mediterranean countries. In recent years, the species has shown a tendency to expand its range to more northern latitudes and higher elevations, probably because of the global warming, although it has not been found in Britain.

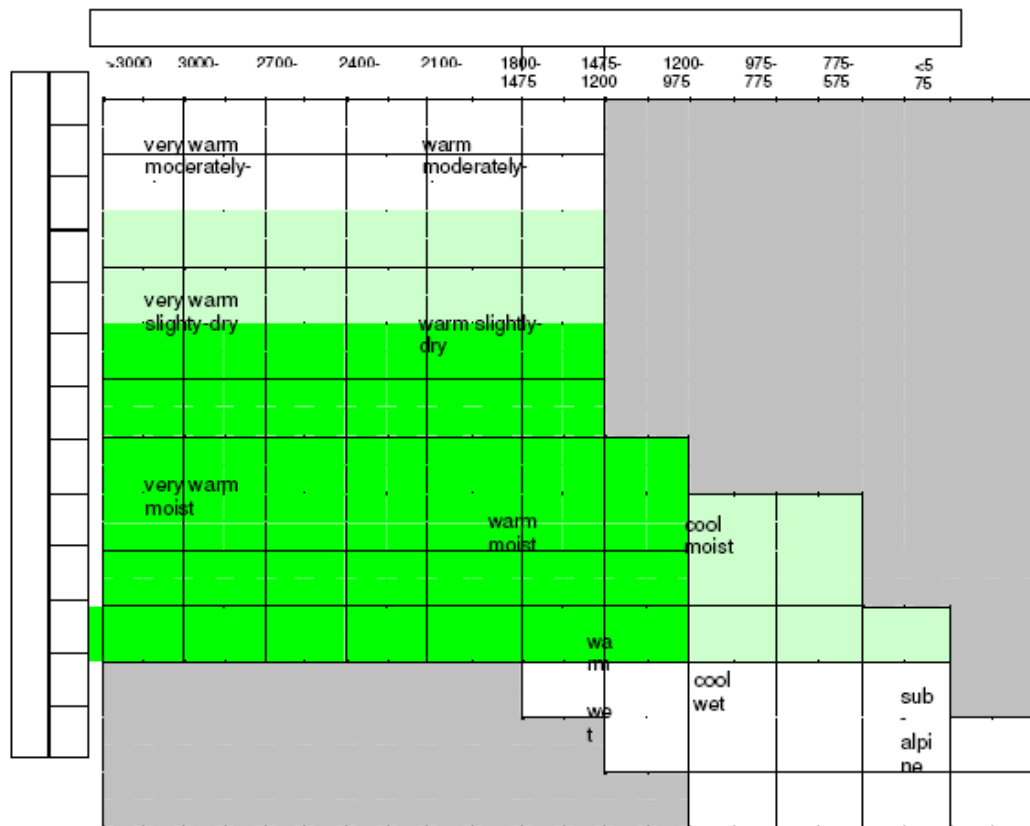
## Use

The tolerance of dry conditions makes this a valuable species for sites in eastern Britain where drought risk is likely to increase under climate change.

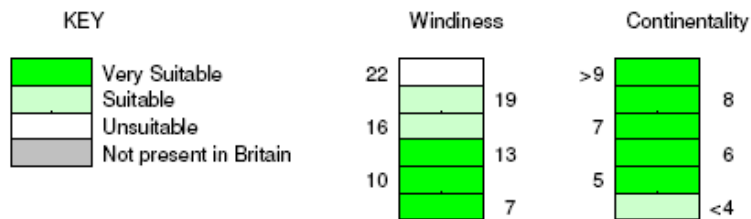
109	Kielder	KIImacurra	SP74
204	North East Lowland	SP74	SP71/72
301	Lake district	KIImacurra	SP74
302	North West	SP74	SP71/72
305	Peninsular	KIImacurra	SP74
401	Yorkshire Moors	SP74	SP71/72
402	East Midlands	PSY100	PSY-VG-002
403	West Midlands	SP71/72	SP70
404	West England	SP71/72	PSY100
405	South East	PSY100	PSY-VG-002
406	East Anglia	PSY100	PSY-VG-002
		Irish	
		English	
		French	



Scots pine - *Pinus sylvestris*



		Soil Quality					
		Soil Nutrient Regime					
		VP	P	M	R	VR	C
Soil Moisture Regime	VD	Suitable	Suitable	Suitable	Suitable	Unsuitable	Unsuitable
	MD	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	SD	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	F	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	M	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	VM	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	W	Suitable	Suitable	Suitable	Suitable	Unsuitable	Unsuitable
VW	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	



## Lodgepole pine Category A

### Native range

Native to western North America where it has an extensive natural range.

### Site requirements

This is a pioneer and light demanding species which grows well on a wide range of nutrient poor soils from podsols through to peats. Its tolerance of acid peat soils explains its extensive use in upland afforestation and slower growing provenances (e.g. Alaskan LP) can be used as nurses for more sensitive species. It is resistant to winter cold, spring frost, exposure, air pollution and salt-laden winds, therefore suited to upland sites in north and west Britain. Interior provenances will tolerate dry conditions. The more vigorous and coarse coastal provenances can be seriously damaged by wind and snow.

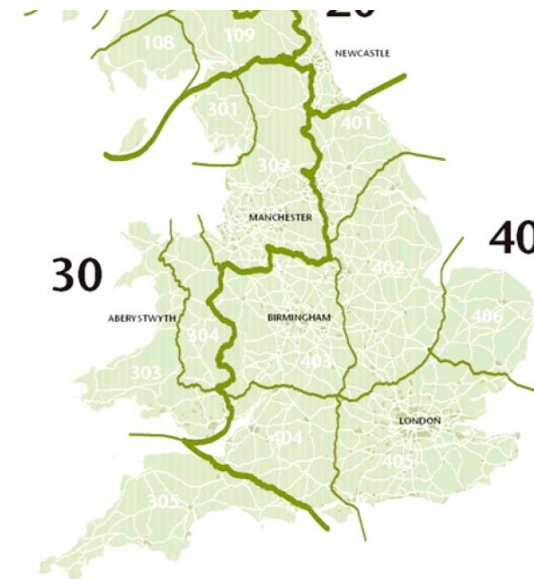
### Pests and pathogens

Like other pine species, Lodgepole pine is susceptible to *Heterobasidion* root and butt rot although losses in plantations growing on peaty soils, especially under conditions of high rainfall, are likely to be negligible. Unthinned stands have also proved vulnerable to the fungal disease red band needle blight. Some provenances are also very susceptible to the shoot pathogen, *Ramichloridium pini*, although attacks have to be repeated and severe before trees are debilitated or killed.

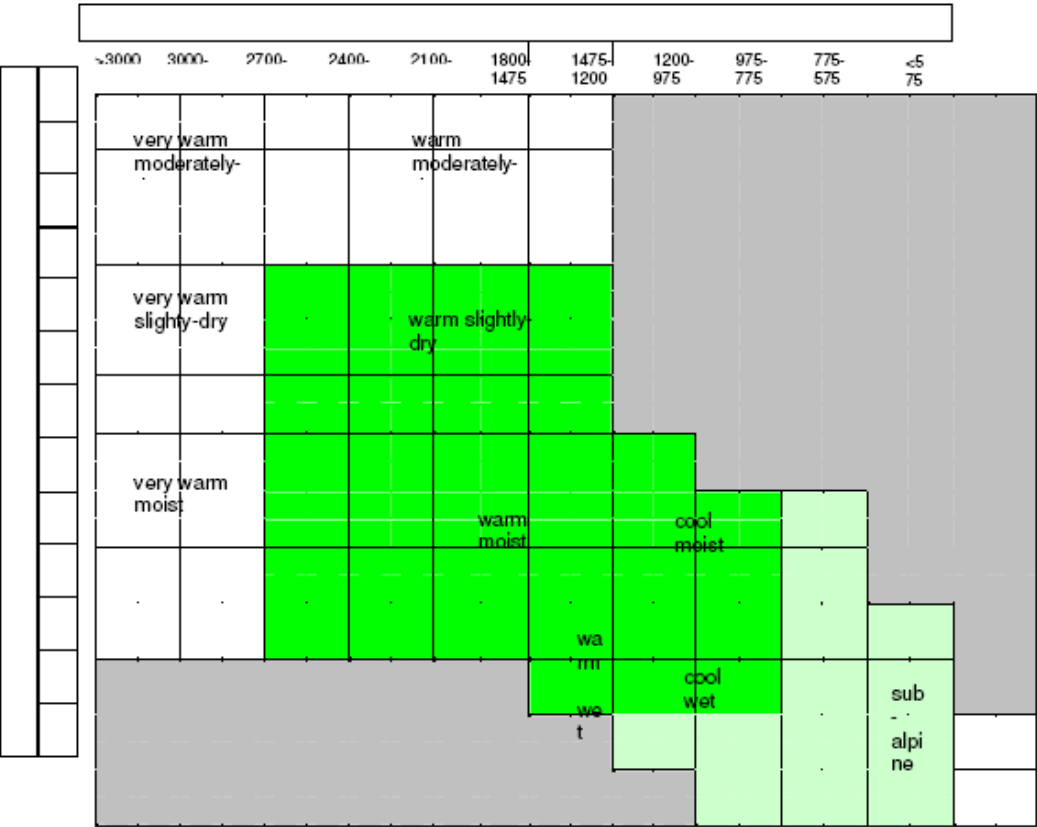
### Use

It is unlikely to be a major species in the future but the tolerance of poor soils and extensive natural regeneration mean that mixtures with other species are likely to develop on many sites.

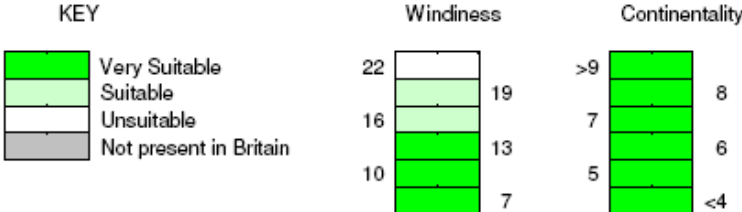
109	Kielder	Skeena valley
204	North East Lowland	
301	Lake district	
302	North West	
305	Peninsular	
401	Yorkshire Moors	Skeena valley
402	East Midlands	
403	West Midlands	
404	West England	
405	South East	
406	East Anglia	
	No England source	There are orchards



# Lodgepole pine



		Soil Nutrient Regime					
		VP	P	M	R	VR	C
Soil Moisture Regime	VD						
	MD						
	SD						
	F						
	M						
	VM						
	W						
VW							



## Maritime pine

## Category B

### Native range

Native to southern and south-western Europe and extensively planted on the Atlantic coast of south west France.

### Site requirements

Although planted in Britain since 1600s, sensitivity to cold and exposure restricted its use to southern and coastal regions. A light demanding pioneer species adapted to acid poor or medium fertility soils and of moderately dry to moist soil moisture status. Only suitable on sites in southern Britain where it can grow faster than Corsican pine. It does not tolerate peat or wet gley soils and is not suited to alkaline sites. Seems not to withstand temperatures below -18°C and is only moderately tolerant of exposure.

### Pests and pathogens

It is quite susceptible to red band needle blight and is likely to be affected by *Heterobasidion* (Fomes root and butt rot), especially on dryer sites with mineral soils. Infection by pine wilt nematode, which has established in Portugal, can also result in high mortality rates for pine species such as maritime pine

### Use

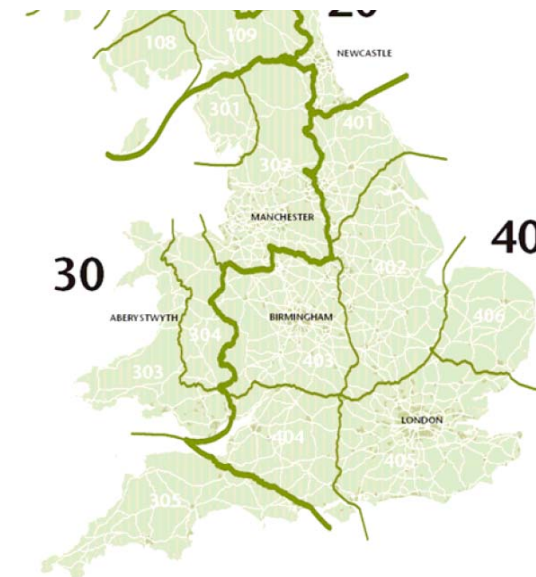
This is a species which could play a larger role in forests in southern Britain and coastal regions with climate warming if improved varieties were used.

109	Kielder		
204	North East Lowland Lake district		
301	North West		
302	Peninsular	PPA-VG-007	PA100
305	Yorkshire Moors		
401	East Midlands	PPA-VG-007	PA100
402	West Midlands	PPA-VG-007	PA100
403	West England	PPA-VG-007	PA100
404	South East	PPA-VG-007	PA100
405	East Anglia	PPA-VG-007	PA100
406	No UK		

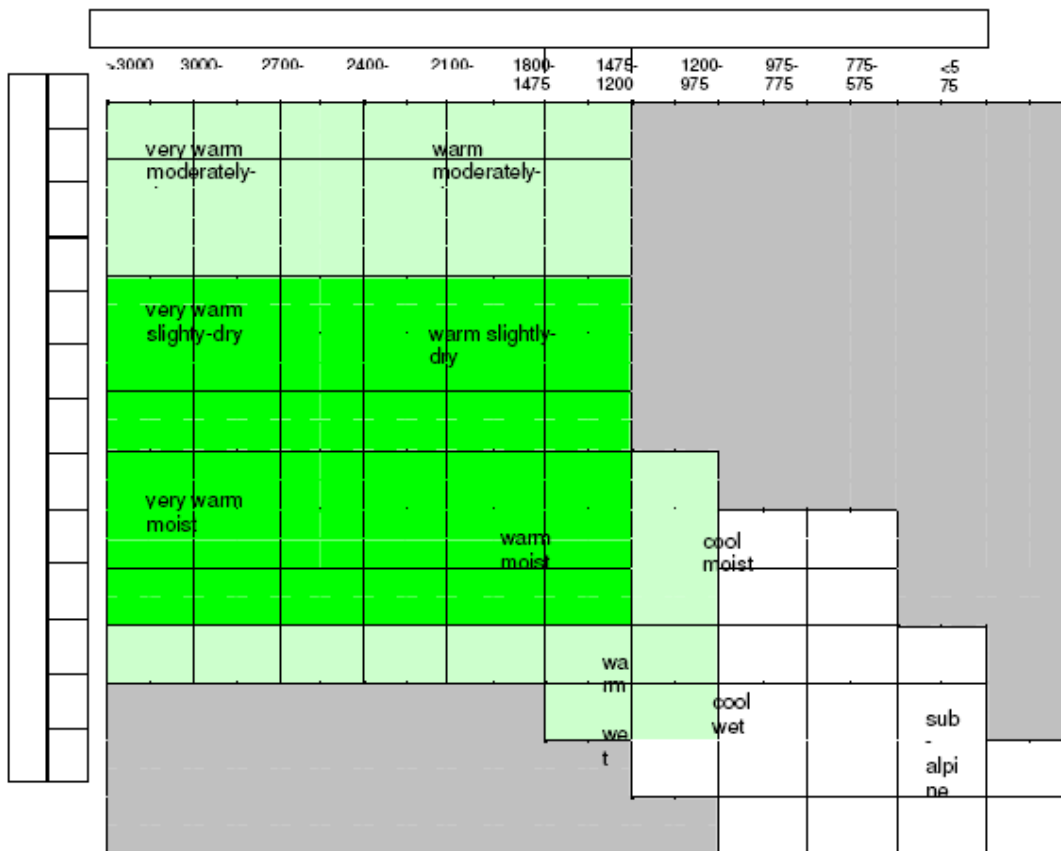
### Forest use

PPA-VG-007 ST AUGUSTIN VF2

Polycross seed orchards (equivalent clones). A rigorous selection within the seed orchard allows a gain in volume (20-30 %) and a reduction of basal sweep (20-30 %).



### Maritime pine - *Pinus pinaster*

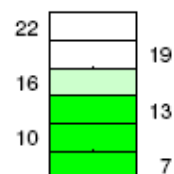


		Soil Quality					
		Soil Nutrient Regime					
		VP	P	M	R	VR	C
Soil Moisture Regime	VD	Suitable	Suitable	Suitable	Suitable	Unsuitable	Unsuitable
	MD	Suitable	Suitable	Suitable	Suitable	Unsuitable	Unsuitable
	SD	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	F	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	M	Suitable	Very Suitable	Very Suitable	Suitable	Unsuitable	Unsuitable
	VM	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
	W	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
VW	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	

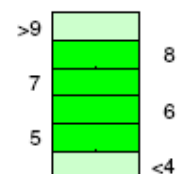
#### KEY

Very Suitable
Suitable
Unsuitable
Not present in Britain

#### Windiness



#### Continentality





## Macedonian pine

## Category B



### Native range

A five-needled pine native to the mountains of the southern Balkans in northern Greece, Albania, Bulgaria and Macedonia.

### Site requirements

A species with slow early growth and intermediate shade tolerance, but which is capable of sustained growth over many years. Cold hardy and frost tolerant and withstands moderate exposure. Not known to be particularly drought sensitive. Trials have shown good growth on a wide range of soil moisture from flushed peats through to podsoles and sand dunes and from poor to medium soil nutrient regimes.

### Pests and pathogens

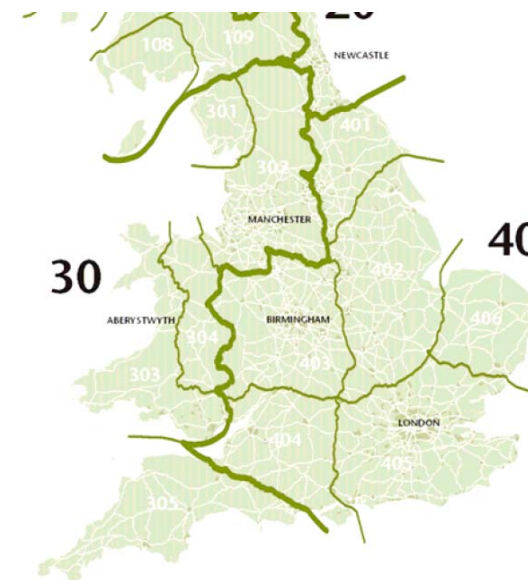
Appears to be resilient to a number of pests and pathogens including pine beauty moth, red band needle blight and, most significantly, white pine blister rust (*Cronartium rubicola*) which affects North American 5-needle pines. Like other pine species, Macedonian pine is likely to be affected by *Heterobasidion* root and butt rot, especially on dryer sites with mineral soils.

### Use

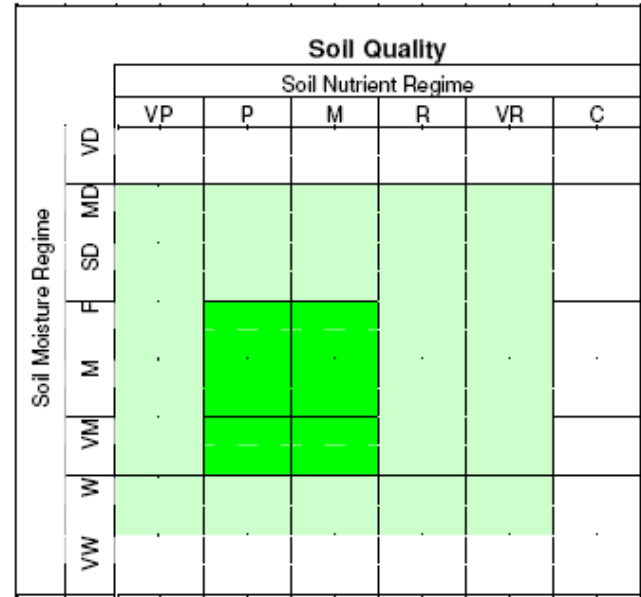
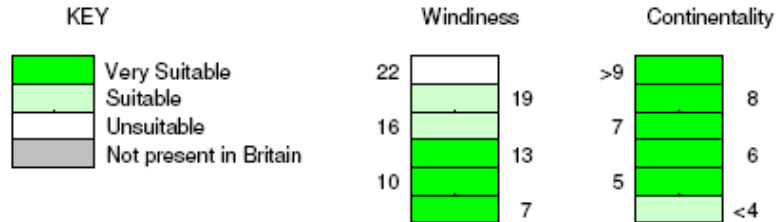
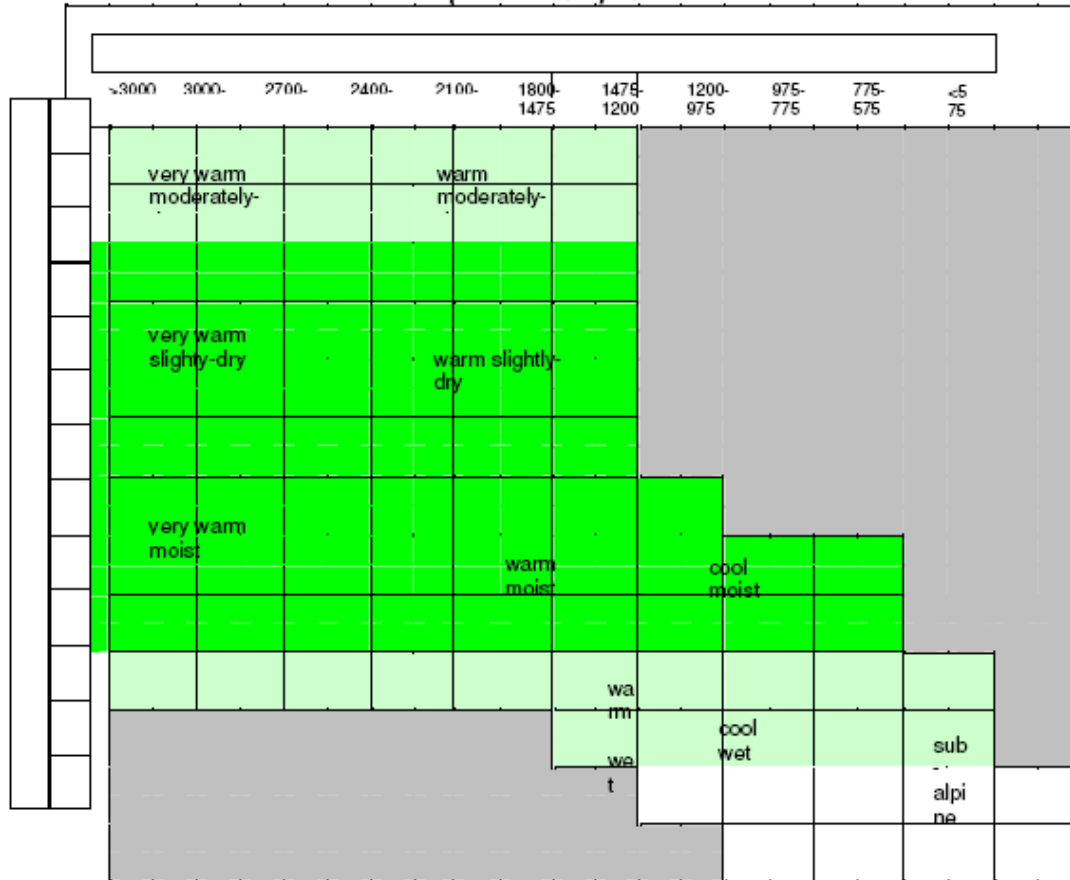
A species which could increase in importance with climate change, not least if other pine species are affected by disease.

109 Kielder  
204 North East Lowland  
301 Lake district  
302 North West  
305 Peninsular  
401 Yorkshire Moors  
402 East Midlands  
403 West Midlands  
404 West England  
405 South East  
406 East Anglia  
4,000 stems a hectare

No UK  
No French



### Macedonian pine - *Pinus peuce*



## Weymouth pine Category C

### Weymouth pine (WEP)

#### *Pinus strobus*

#### Native range

Native to eastern North America as far north as Newfoundland.

#### Provenance choice

No provenance testing has been carried out in Britain; seed sources from the native range from New England northwards should be suitable. The species is adapted to a cool, humid climate and is of intermediate shade tolerance when young but then requires full light for good growth.

#### Site requirements

It can be grown in mixture with Scots pine, birch and other broadleaved species. Grows on poor to rich sandy or sandy loam soils of moderately dry to fresh soil moisture. Not suited to very poor soils or to peats and does not tolerate alkaline soils. Appears to be cold hardy throughout Britain but has no more than moderate tolerance of exposure.

#### Pests and pathogens

The continuing risk from white pine blister rust (*Cronartium rubicola*) which is extremely damaging to this pine species means that it should only be planted on a small scale and preferably in mixture.

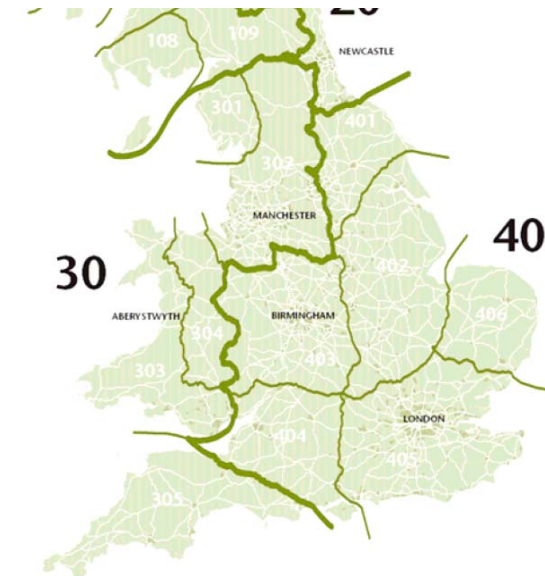
#### Use

Planted on some scale in Britain until the end of 1800's when plantations were severely attacked by white pine blister rust and the use of the species was discontinued.

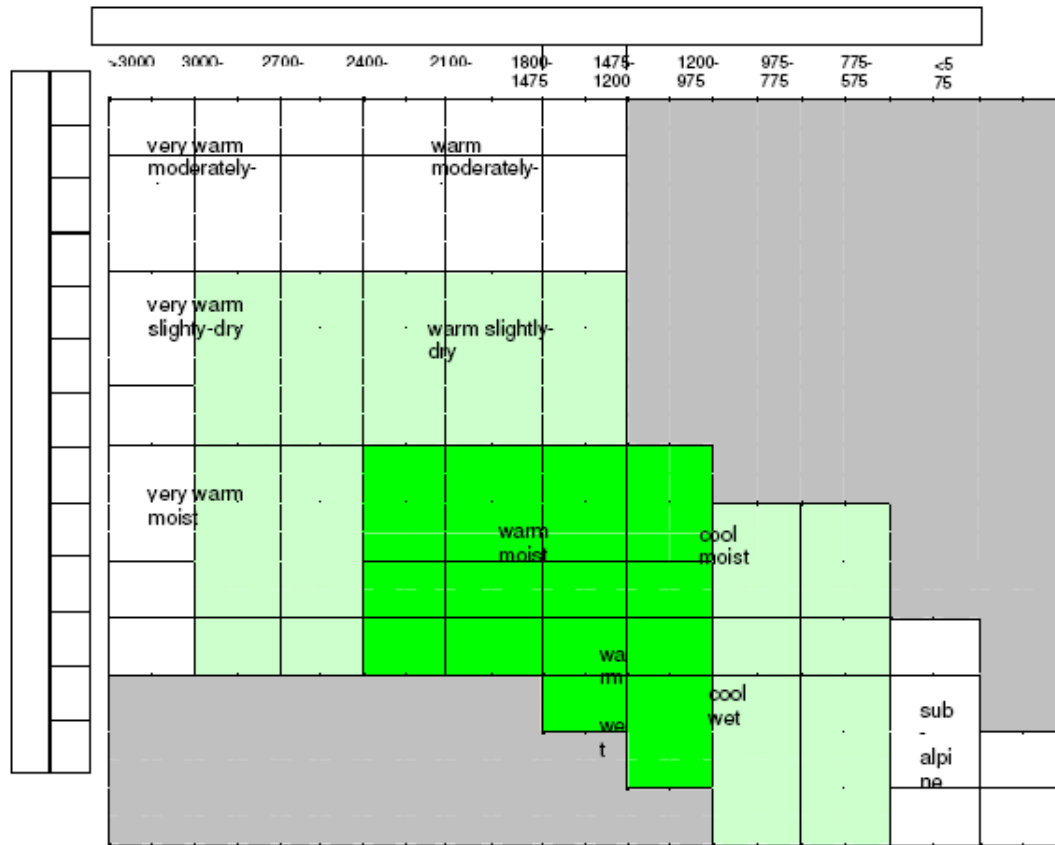
#### Tree species and provenance

Information on species that are either widely grown in British forests at the present time or which could play an increasing role in the future.

109	Kielder
204	North East Lowland
301	Lake district
302	North West
305	Peninsular
401	Yorkshire Moors
402	East Midlands
403	West Midlands
404	West England
405	South East
406	East Anglia



### Weymouth pine - *Pinus strobus*



[http://en.wikipedia.org/wiki/Eastern\\_White\\_Pine](http://en.wikipedia.org/wiki/Eastern_White_Pine)

