

### **COST ACTION FP 0703**

Echoes: Expected Climate cHange and Options for European Silviculture

# Country Report: Major points

## <u>United Kingdom</u>

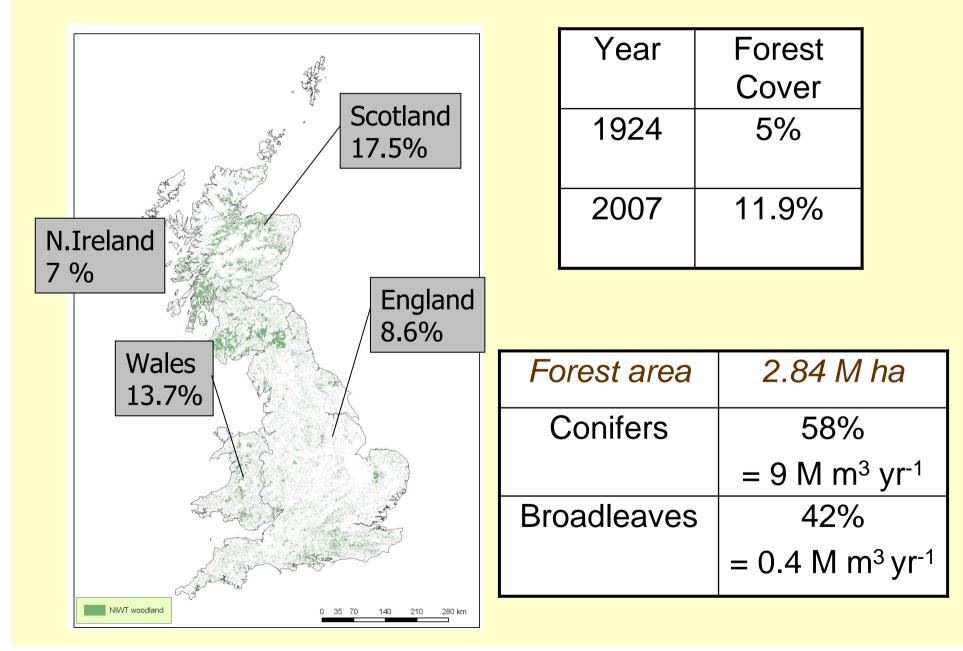
22-24 January 2009, Florence - Italy

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## Forest area of UK



## **Climate Change Publications:** 2000 to present



Modelling the Future Clim Suitability of Plantation



KEY FIND

Climate change and the future for broadleaved tree species in Britain

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ange predictions for the UK indicate a warming of between 2 and 5°C by summers and wetter winters also anticipated across the m



### Impacts of climate change forestry in Scotland – a syn spatial modelling research

#### Duncan Ray

Climate change is now one of the greatest global challenges, and research is unde on all aspects of the environment. Forestry Commission Scotland has commission how forests and forestry in Scotland will be affected by climate change. This Resea of the likely impacts, with preliminary recommendations to support development forestry in Scotland. Climate change will create many challenges and opportunitie Productivity will increase in some areas and a wider selection of species will become potential threats, including drought, increased insect and disease damage, and wir to combat these will be necessary. There are many uncertainties associated with cl on trees, management systems and forest operations. A key basis for risk planning from broadening the choice of genetic material, mixing tree species in stands, to v the timing of operations. Scotland's aspiration to expand woodland from 17% to 2 opportunity to target reforestation within habitat networks. This will reduce wood help improve the resilience of woodland ecosystems to climate change

ECRN101

### Impacts of climate change on forestry in Wales

#### Duncan Ray

Climate change is now one of the greatest global challenges, and research is under way to establish the like on many aspects of the environment. Forestry Commission Wales has commissioned Forest Research to det how forests and forestry in Wales will be affected by climate change. This Research Note provides an initial sy the likely impacts, with preliminary recommendations to support the revision of the Wales Woodland Strateg Climate change will create challenges and opportunities for the Welsh forest industry. Productivity will incre some areas and a wider selection of species will become suitable, but effects will vary spatially and by specie approaches to woodland management will be required to address potential threats of drought, increased pe disease damage, and wind damage. There are many uncertainties associated with climate change, and the lik impact on trees, management systems and forest operations. A key concept in risk planning and management diversification: from broadening the choice of genetic material, mixing tree species in stands, to varying mar systems and the timing of operations. An aspiration of the current Wales Woodland Strategy is to increase th proportion of woodlands managed using low impact silvicultural systems. This conforms with the need to ad management through species choice, promote management that has a lower environmental impact on fores and improve the overall resilience of woodland ecosystems to climate change.

ECRN301



### Climate Change and **British Woodland**

### FORMATION NOTE

MARK BROADMEADOW AND DUNCAN RAY OF FOREST RESEARCH JUNE 2005

#### MMARY

global climate is changing as a result of human activity, caused primarily by the increased concentration of carbon ide in the atmosphere. The most recent predictions for the UK suggest an increase in temperature and changes in all patterns, wind speed, cloud cover and humidity. This Information Note explains how these environmental change affect the growth of trees, including the distribution of individual species. Implications for woodland management and tice are outlined, and guidance is given on climate change adaptation

### OBAL CLIMATE CHANGE

concentration of so-called 'greenhouse' gases (GHGs) e atmosphere has been rising for more than 100 years result of human activity, particularly the burning of I fuels. The most important of these greenhouse gases rbon dioxide (CO<sub>2</sub>) which has risen from a entration of approximately 270 parts per million 1) prior to industrialisation to the current value of ppm, and is predicted to continue rising (IPCC, 2001) igure 1).

#### re 1

ENVIRONMENT

POLITICS

Forest Res

rved atmospheric CO2 concentrations (ppm) from 1200 e present day together with a range of predictions to 2100 2, 2001). The blue and red lines represent the B1 and A1FI vios of IPCC (2000), respectively, equivalent to the Low High emissions scenarios of UKCIPO2 (see page 2).

The increase in greenhouse gas concentrations causes the atmosphere to trap a larger proportion of radiant energy from the sun. As a consequence, global surface temperature are gradually rising, and the ten warmest years in the instrumented temperature record (1861-the present day) have all occurred since 1990. The gradual warming of the earth's climate also results in changes to other climatic variables such as rainfall, humidity and wind speed. Weather patterns and the seasonality of weather may also be affected. Models predicting future global climatic conditions have been developed and scenarios for change to temperature and precipitation are now available Predictions of climate change at a global scale are for a warming of some 3-5°C over the coming century. This agnitude and rate of change has not occurred since before the last ice age. The implications of this level of temperature change are further highlighted by the observation that, during the last ice age, mean northern hemisphere. temperatures were only 5-6°C colder than they are now.





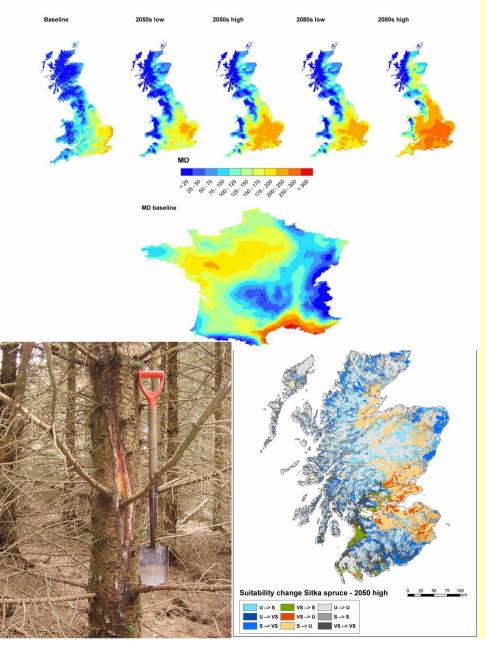
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### Impacts

- Milder winters Warmer summers – Inc. CO2
  - Earlier budburst later bud set
  - Increased growth in warmer and wetter summers
- Wetter winters Drier summers
  - Winter water logging, summer drought – abiotic damage, reduced growth in dry summers
  - Biotic damage, reduced growth + increased mortality
  - Reduced tree stability
  - Increased incidence of fire
  - Slope stability, soil erosion, water quality
- Changing suitability Ecological Site Classification
  - Biophysical suitability model
  - Main drivers being drier summers and wetter winter soils

Moisture Deficit comparison between France baseline climate and UKCIP02 scenarios for Britain



## Adaptation

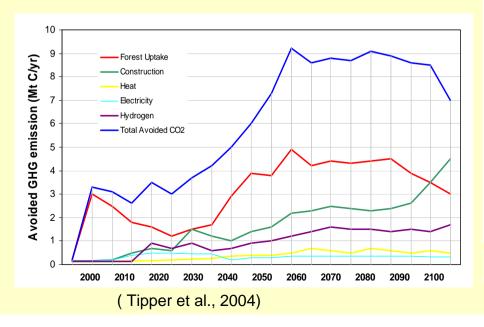
- Spread risk and increase resilience of existing stands
  - Greater use of mixtures;
  - More dynamic silviculture;
  - More diverse stand structures
- Adopt shorter rotations
  - Accelerated tree breeding;
  - More deployment of improved (conifer) genotypes;
  - Timber products from trees with more juvenile wood.
- Improved support tools
  - Better growth and yield models;
  - Decision support systems.

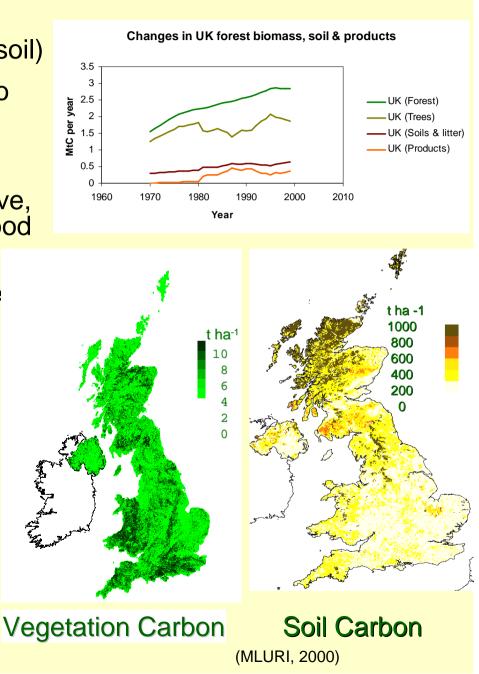




## Mitigation

- Maintaining/increasing C pools (also soil)
- Reforestation & forest management to enlarge CSS
- Short rotation forestry
- Using wood for fuel: C neutral, effective, reliable, sustainable & cheap (1m<sup>3</sup> wood used instead of coal avoids 0.2tC)
- Wood products: 1m<sup>3</sup> timber to replace V of bricks/concrete avoids 1-2 tC emissions





## Conclusions

- Need for continuing and consistent knowledge transfer;
- Closer research-policy-practice interface;
- Practical guidance and decision tools;
- Understand foresters' perceptions of climate change;
- Appreciate foresters' time horizons and their willingness to act;
- Design effective incentives for adaptation/mitigation;
- Consider an appropriate regulatory structure.