

## UK Forestry and Climate Change

Climate change caused by greenhouse gas emissions largely due to the burning of fossil fuels and deforestation, has now been fairly widely accepted by many as an “inconvenient truth”. Carbon dioxide emissions grew exponentially between 1970 and 2004 by approximately 80%. The global impacts of this could see average global temperatures rising by 2-3 degrees Celsius. Predictions for the effects of this rise for the UK climate could include; a greater risk of winter flooding or sudden and intense weather events such as heavy rain events in summer and wind storms, a likelihood of spring and summer droughts and late spring frosts.

Rising temperatures will have direct impacts on UK forestry and are likely to be; earlier leafing enhancing the risk of frost damage, effects on chilling requirements for plant dormancy and germination, tree species suitability and changes for woodland species, composition and structure of woodlands in the future.

Foresters will need to consider and incorporate management techniques that will help them adapt to and mitigate the changes with regard to harvesting, extreme weather events, fire, pests and diseases and biosecurity. Since the Read report “Combating Climate Change – A Role for UK Forests” (2009) was published, we have possibly been witnessing the emergence of a series of biotic effects of climate change over the last few years – i.e. tree diseases such as *Phytophthora ramorum*, *Chalara* affecting ash etc. Foresters will also be required to plan for the potential risk of abiotic disturbances as well, such as the likelihood of an increase in forest fires, particularly in the south of England, caused by drought, extreme flooding events especially during winter and spring and an increase in the incidence of windthrow. In the period 1950-2000, an annual average of 35 million cubic metres of wood within the Eurozone was damaged by natural disturbances. Storms were responsible for 53% of the total damage and fire 16%. Future scenarios predict an increase in these kinds of disturbances. A more pro-active and informed response will be required due to the “lag effect” (the long response rates of trees and forests to affect change). Fortunately, the opportunity needs to be seized upon now as many areas of UK conifer forests are due for felling in the next 10-20 years as they come to the end of their rotations. Greater use of more southerly provenances and more mosaic mixtures will be required as a replacement for most of the major conifers, as well introducing structural transformation through silvicultural techniques such as Alternatives to Clearfelling (ACF) and Continuous Cover Forestry (CCF) management as these systems are considered to be more wind-firm, have lower carbon losses during harvesting and maintain higher humidity levels. We need to increase the resistance and resilience of existing broadleaved woodland by stressing to owners of unmanaged woodland the importance and benefit of management intervention, which could include thinning to increase structural and age diversity, underplanting and gap planting with intimate mixtures appropriate for the site, as well as encouraging natural regeneration so as to increase biological diversity. Forest management will need to take into account that sites with a marginal soil moisture requirement at the moment, are likely to prove vulnerable as a result of flooding which could cause injury to plants especially during the growing season, cause inhibition of seed germination and mortality and add to the threat from established diseases, such as *P. ramorum* and Invasive Non-Native species, e.g. rhododendron, as well as new pests and pathogens.

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