



“There is new and stronger evidence that most of the warming observed over the

Living with climate change
and its effect on trees and woodland in the **East of England**
Tree and woodland managers

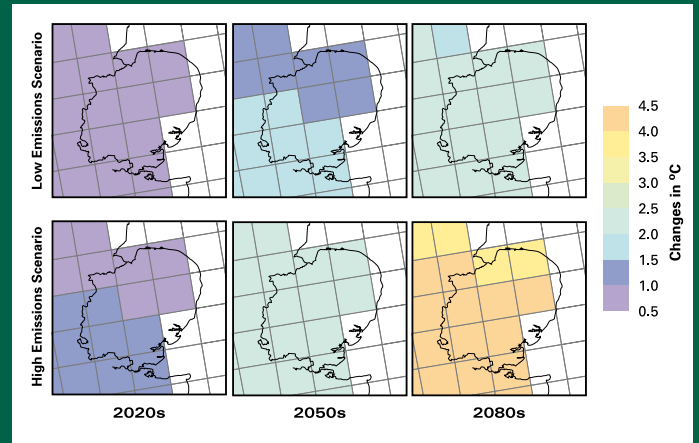
last 50 years is attributable to human activities”

Is the climate in the East of England changing?

"There is new and stronger evidence that most of the warming over the last 50 years is attributable to human activities.¹"

Our climate is changing and will continue to change over this century and beyond. The East of England will experience:

- * Hotter and drier summers
- * Milder and wetter winters
- * More extreme climate events
- * Increased risk of flooding in some areas
- * Rising sea levels, increasing the risk of coastal flooding and erosion.



Predicted changes to annual mean temperature

These climate changes are likely to impact on woodland productivity, composition and condition. This leaflet summarises a study undertaken by Forest Research, an agency of the Forestry Commission.

Ref: UK Climate Impacts Programme, UKCIP02 Scenarios.



How is the East of England Region responding?

the East of England is at the forefront of developing regional climate change adaptation guidance

In response to the pressures and opportunities created by climate change, several organisations have come together to produce guidance on 'Living with climate change in the East of England'. The intention is to support living with, rather than fighting against, climate change.

This leaflet provides an outline of the guidance for tree and woodland managers.

Full guidance is available on the Sustainable Development Round Table's website www.sustainability-east.com and on the Regional Woodland Strategy website www.woodlandforlife.net



Environment Agency

Areas of land at risk of flooding in the East of England

different areas face different impacts

The East of England is particularly vulnerable to the impacts of climate change. The region is low-lying which puts it at risk of flooding, particularly after heavy rainfall in winter. In contrast, some areas are prone to water deficiencies, especially the south. It is also well placed to take advantage of some of the impacts of climate change.

This guidance concentrates on planning for adaptation in order to minimise the adverse impacts of climate change and to take advantage of the opportunities created.



Adaptation and mitigation

Responses to climate change should involve **mitigation** against the causes of climate change and **adaptation** to the impacts of climate change. Both are very important.

This guidance concentrates on planning for adaptation in order to minimise the adverse impacts of climate change and to take advantage of the opportunities created.



Mitigation

- Use of wood fuel bioenergy on a wide scale.
- Reduction in levels of some air-borne pollutants through tree planting.
- Wildlife corridors provided by riparian woodland.
- Woodland cover may have alternative land use in areas liable to flooding.
- Woodland cover as a stabilising influence on river banks and peak flows.
- Salt-tolerant tree species cover in areas subject to saline ingress.
- Urban woodland providing cooling and shading effect and visual improvement to the environment.
- Shelter belts to prevent soil erosion from drought and wind.
- Possible revenue generation from carbon trading schemes in the future.

Adaptation

- Where a species is already on the limit of its moisture range, it should not be planted.
- Changes to grant schemes offered by the Government may be necessary.
- Mixed planting of native species should be encouraged to increase success of continuing woodland cover.
- Aspiration of planting only native species should be considered carefully if it is not critical on conservation grounds.
- Consideration to the use of more southerly provenances of native species in appropriate circumstances.
- Habitat Action Plan targets for beech/yew native woodlands will not be actively pursued in the East of England.
- Species must be matched to site conditions now and in the future.

Why take account of climate change?

our climate is already changing and it will continue to change throughout this century

Extreme weather events such as the flooding in the autumn and winter of 2000 have shown that climate can have a big impact on our society, with associated financial costs.

The impacts of climate change are likely to become increasingly evident in the coming decades. The combined effects of rising temperature, falling summer rainfall, lower relative humidity and a longer growing season will affect the growth of trees and woodland.

Because of the long-term nature of tree growth and woodland management, it is vital to take climate change into account when planning for the whole of the 21st century and beyond.



Climate Climate predictions for the UK are:

- An overall rise in temperature of 2 to 4.5 degrees
- A longer growing season, advancing spring flushing of trees by up to 30 days
- No dormant season
- A fall of up to 60% in soil moisture levels in summer
- An increase of up to 20% in winter rainfall
- A fall in humidity of up to 15% and less cloud cover.

The impacts of climate change are likely to become increasingly evident in the coming decades and will affect all aspects of woodland management. For example, individual tree species may fail to flourish, habitats may change and demand for woodland products may alter. If woodland managers do not plan for and respond to these pressures appropriately, costly remedial action which could have been avoided is likely to be required.

If resilience to change can be incorporated into decisions taken today, woodland managers will be better prepared for the future. It is in the interests of managers to act now to find sustainable solutions that allow for climate change.



Impact of climate change on tree species

the nature and character of native woodland is likely to change and the current National Vegetation Classification (NVC) system may need amending

- Coniferous woodland generally uses more water than other land uses; this may limit where it is deemed an acceptable land cover.
- The best-suited conifer will be Corsican pine across the whole region and Douglas fir in parts of the region.
- Scots pine will decrease in suitability.
- Norway spruce is unlikely to be commercially viable
- Of the commercially planted broadleaves, only Pedunculate oak is likely to remain commercially productive across much of the region.
- Beech is most likely to be adversely affected.

Impact of climate change on tree pests and diseases

while it is reasonable to assume that most insect pests have the potential to become more damaging as a result of climate change, the pests' natural enemies may also increase, making the overall effect less predictable

As pests and diseases respond to climate change, their impact on trees and woodland also changes.

There is likely to be :

- An increase in the population density of mammalian pests, especially deer, rabbit and grey squirrel, as a result of milder winters.
- An increase in the activity of pathogens and insect pests.
- The possible establishment in the region of more exotic pests such as the Asian long-horn beetle
- An increase in the incidence of phytophthora root infection and of red band needle blight in Corsican pine.

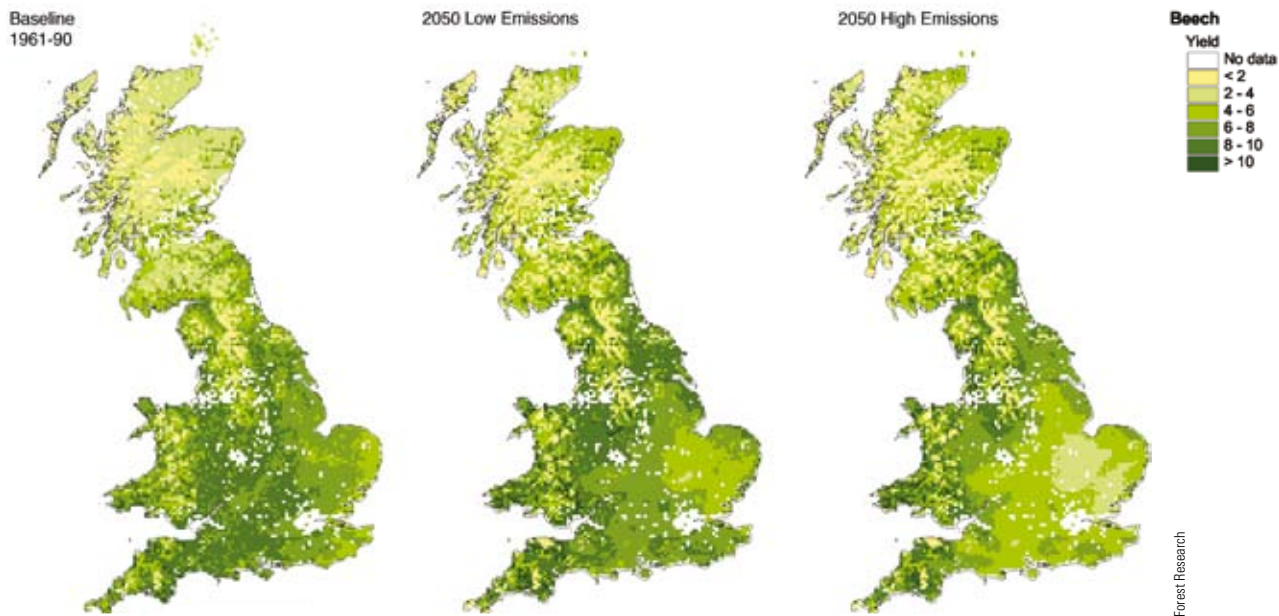


What action should be taken ?

action planning should use a range of time frames

Climate change is a gradual process that happens over decades. Why act now? Why not wait until predictions are more precise? Work to adapt to climate change needs to start now but it will be a long-term process that needs to be tackled in a staged, prioritised way.

- Long-term planning processes should consider woodland creation prior to residential and business development so that mature trees can provide benefits such as reduction of air pollution.
- Novel species such as *Robinia* and *Nothofagus* might be considered for commercial forestry.
- Species suitability should be assessed to ensure future woodland cover.
- Inspection of imported plants and woody material should be maintained to identify pests and diseases from abroad.
- Monitoring of urban trees on clay soils should be undertaken as the high summer take-up of water by trees can result in subsidence and increased insurance claims.



Climate change scenarios: Climate suitability for beech

'Act now'

- to provide 'no regret' solutions that can deliver benefits under future climate change scenarios.
- to minimise the risk to your organisation by keeping up-to-date with knowledge on the impacts of climate change and what it means for you.

Tree and woodland managers need to establish links with relevant environmental and conservation organisations, research institutes and government bodies to tackle climate change in the most effective way possible. The guidance sets out suggested key partners for implementing adaptation responses. For example, Forest Research, an agency of the Forestry Commission, is a key organisation providing climate change advice to woodland managers.

Further information on climate change and woodlands is available from Forest Research, Environmental and Human Sciences Division, Alice Holt Lodge, Farnham, Surrey, GU10 4LH or visit www.forestresearch.gov.uk/climatechange

The Impact of Climate Change on Trees and Woodland in the East of England can be accessed at

www.woodlandforlife.net/wfl-woodbank

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Living with Climate Change in the East of England can be accessed at www.sustainability-east.com

