

Climate change adaptation

How can we adapt our forests and woodlands for the changing climate?

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The changing climate is affecting our trees, forests and woodlands, how they grow and survive and the important ecosystem services they provide. For our forests and woodlands to thrive, adaptation measures must be considered carefully, and action taken. Ten measures to reduce climate risks and improve resilience are presented.

Background

- Planning for the changing climate is a challenge for forest managers because past approaches are unlikely to lead to the same outcomes in future.
- Although climate change may provide opportunities, such as a wider species choice and faster tree growth in some locations, associated risks are of concern.
- The UK Forestry Standard provides detailed guidance and a framework to select adaptation measures.

Adaptation measures

Once the risks from gradual climate changes and more frequent extreme events have been assessed, the first step is to ensure that the objectives for the forest or woodland consider adaptation to climate change. Different measures will be appropriate for different woodland types and management objectives, and several measures may need to be combined. Management plans should identify the main risks and which measures are required. Once they are implemented, monitoring is important to build knowledge and inform future decisions.

Increasing tree species diversity

- Diversification of tree species in woodland has potential for improved productivity, increased biodiversity, and reduced risks compared to monocultures.
- Tree species can be diversified in different ways – such as changing the dominant species, mixing different species or increasing the overall number of species across a landscape.

Using mixed-species stands

- Mixed-species stands may provide a number of benefits including reduced risk of wind, fire and drought damage, depending on the location, site conditions and species mix.
- The compatibility of proposed tree species is key, especially their growth rates and shade tolerance when grown in mixtures, and their future site suitability.

Selecting appropriate seed or plants

- Selecting the appropriate source of seed or plants (known as provenance) for the site and local climate can reduce risks from drought, frost, pests and diseases.
- Provenance choice is complex and may require expert advice.
- Uncertainty in how provenances will perform may be reduced by using a range of species and provenances to spread the risk.

Encouraging natural regeneration

- Naturally regenerated stands may reduce wind, drought, frost, pest and disease risk.
- Natural regeneration from seed may select for individuals better adapted to changing local site conditions which can contribute to stand resilience.

Diversifying stand structure

- A more varied age structure and the presence of an understorey of younger trees can help spread risks and provide future options.
- One option is to convert uniform-aged stands to a more varied age structure, potentially alongside other adaptation measures (such as increasing tree species diversity), and to adopt continuous cover forestry (CCF) management.

Choosing appropriate establishment methods

- Appropriate establishment practices can help to reduce risks from wind, pests, diseases and drought while also reducing carbon losses at establishment.
- Planting methods and timing may need to change given milder winters and drier spring and summer conditions.
- Climate change may reduce the effectiveness of current weed-control measures so they will need to be monitored and modified if necessary.

Changes to stand thinning

- If initiated early and appropriately in the management cycle, stand thinning can reduce several risks, including drought, wind, wildfire and some pathogens.
- Thinning also provides opportunities to implement further adaptation strategies, e.g., conversion to CCF, and changing the balance of species already present.

Adapting infrastructure

- The direct influence of the climate and the indirect effect of adaptation measures are likely to require changes to forest infrastructure, such as specifications for road design and maintenance of culverts.

- In preparation for more disruptive storms and more frequent wildfires, for example, it is essential to ensure that access, safety and communications can be maintained.

Contingency planning

- Contingency plans enable managers to identify and plan for risks, particularly extreme events which have a high impact, but relatively low probability, e.g., windstorms and wildfire.
- Plans can reduce the impacts of such an event by improving the speed of response and reducing recovery time.
- It is important to align local plans with wider frameworks such as national forestry sector contingency plans.

Creating new climate-change-ready forests and woodlands

- New woodland design, management and objectives should take account of the changing climate.
- Woodland creation is an important part of the wider adaptation of society to climate change, as forests and woodlands can provide shade and shelter, give flood protection, and reduce both air pollution and soil erosion. They provide wildlife habitats and alternatives to fossil-fuel intensive materials and they lock up carbon.

More information:

Guidance on adaptation measures:

www.forestresearch.gov.uk/research/climate-change-adaptation/

Tools to assess tree species suitability and risks:

www.forestresearch.gov.uk/tools-and-resources/fthr/tools-to-support-forest-management-decisions/

<https://climatematch.org.uk/>

Accredited suppliers with Plant Healthy Certification:

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