**Future of UK treescapes**

This programme aims to understand the environmental and societal benefits of landscapes in which trees play a significant role. It will bring together environmental scientists, social scientists, economists, and arts and humanities researchers to form large research collaborations.

The future of UK treescapes programme seeks to significantly improve the environmental, socio-economic and cultural understanding of the functions and services provided by UK treescapes, in order to inform decision making on the expansion of future treescapes for the benefits of the environment and society.

The programme will bring new understanding of the treescapes in the UK:

* the type and extent of these treescapes and the functions and services they provide for the environment and to society
* their vulnerability and adaptive capacities given current and future environmental change
* plausible social, economic, cultural, technological and environmental pathways to enhance the extent, quality and adaptive capacity of these treescapes for the benefits of the environment and society.

Three themes have been identified to address the overarching objective.

### Theme one: form, function and values of UK treescapes

This theme seeks to better understand how we characterise a fully functioning treescape and the functions and services provided by UK treescapes. It will explore the ways they have been shaped by different management practices, environmental conditions, cultural and socio-economic drivers and values through time, and how this is expected to change with the new social, economic, cultural and environmental demands placed on treescapes. Characterisation will require data at scale and from diverse sources, from the molecular, organismal and biome through to socio-economic datasets, cultural and historical evidence, and aesthetic and ethical values.

### Theme two: opportunities, barriers and pathways for expansion of UK treescapes

Understanding the potential contributions and limitations of expanding UK treescapes to delivering local requirements as well as national and international policy goals is an important theme in this programme. There is a need to understand the environmental, social, and economic benefits and limitations of different strategies of treescape expansion and configuration. Realistic pathways to achieve afforestation targets will need to be identified, taking into account the diverse benefits and disbenefits of treescapes and balancing competing demands and priorities of stakeholders. Pathways should lead to a sustainable expansion of the treescapes, and there is a need to understand how this pathway feeds into policy making and its contributions to economy, climate mitigation and adaptation, and changing societal and cultural values in the face of pressures arising from the expansion.

### Theme three: resilience of UK treescapes to global change

The UK treescape needs to be placed in a global context – both policy and environmental. The programme seeks to identify these drivers of change (for example changes in climate and atmospheric pollution, increased pest and pathogen outbreaks, and human population change) that pose significant risks to the resilience of current and future UK treescapes over decadal and longer timescales, and identifying strategies and measures (such as low risk pathways) that could mitigate their impact and enhance treescape resilience.

A holistic, whole-systems approach will be required to capture interactions across spatial and temporal scales and trophic levels, alongside socio-economic and cultural responses and management interventions. The programme seeks to exploit innovative sensing, analytical, and genetic technologies, arts and humanities methodologies, as well as the creation and linking of environmental, social and economic data sets that will transform understanding of treescape form, function and feedback.

Landscapes across the UK will be changed dramatically by 2050. They need to become more resilient to pressures such as changing climate, disease, and competing land use demands, in order to reverse the decline in biodiversity and environmental quality.

Alongside deep cuts in anthropogenic carbon emissions, the Intergovernmental Panel on Climate Change recognises the potential of treescape restoration to contribute to climate change mitigation and adaptation. The UK government has committed to net-zero greenhouse gas emissions by 2050, and afforestation is expected to play a key role in delivering the final and hardest part of this target.

Recent radical changes in UK agricultural policy introduce a public money for public goods approach, which favours the range of public goods delivered by multipurpose landscapes. The 25 Year Environment Plan espouses a move from existing biodiversity net gain to a broader environmental net gain requirement that recognises the diversity of benefits, trade-offs and synergies of landscape changes.

Forest and woodland management must also be responsive to different future societal needs and consider community, cultures, and histories with regards to the changing UK treescape. National and devolved nation policies, addressing international climate change and biodiversity goals (such as the proposed Environment Bill), emphasise the enhancement and expansion of their treescapes, while simultaneously setting ambitious targets to create regionally specific cultural, social, and economic goods.

A common theme across all these policies is the need to recognise the multiple environmental, social, economic, and cultural benefits which treescapes can deliver, which will drive innovation and delivery of a bio-economy contributing strongly towards energy production, food security, material science, public health, community assets, including heritage preservation and recreation.

An interdisciplinary approach, across the environmental and social sciences and the arts and humanities, is required to improve our understanding of the complex interplay between environmental conditions and constraints on the treescape with our social and cultural requirements, and failure to recognise them can result in highly adverse outcomes. Advances in new and emerging technologies, application of novel methodologies and use of environmental and socio-economic data and historical records, and incorporation of local community perspectives and collective memories, have the potential to reveal many previously hidden properties and trends, and create a richer understanding of different treescapes.

Improved understanding of this complex interplay will help decision makers, at all levels from individual through to community, local and national governments, determine the location and type of treescapes required in the future in order to grow the green economy, reduce inequalities and lead to healthier, more resilient and culturally rich environments for future generations.