Climate Change Accord:

a call for Resilient Forests, Woods and Trees

July 2015

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We believe that it is necessary to act now to provide a secure future for our forests, woods and trees, that significant changes are required to widely-accepted and practiced systems of management to make them resilient, and we are committed to help realise the vision set out in this Accord.

Resilience definition (United Kingdom Forestry Standard):

'The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change'.

In the context of this Accord improving resilience would mean that: *Forests, woods and trees continue to thrive and adapt in the face of climate change impacts and associated environmental pressures, and thus deliver the multiple benefits they provide for people and wildlife, now and in the future.*

We believe that the long-term health and function of our forests, woods and trees is threatened by rapid environmental change. The threat comes from a rapidly changing climate and increasingly variable weather conditions which can put a range of stresses on our forests, woods and trees, particularly in combination with other pressures, such as an increased incidence of tree pests and diseases, pollution, water abstraction, fragmentation and isolation of our woods, more 'intensive' land uses between woods, and damage caused by invasive species.

We are committed to take action to increase the resilience of our forests, woods and trees so that they can better adapt to change. Resilient forests, woods and trees are those that have the ability to adapt to change, environmental, ecological and economic. Resilience can be characterised by a diversity of site-appropriate tree species and provenances, incorporation of structural complexity, and habitat diversity. Damage to woodland from herbivores (especially deer and squirrels), insects and pathogens needs to be actively monitored and managed to meet the owners' objectives and protect the health of trees and woodland at a landscape scale. We believe active practice of sustainable forest management in accordance with the UK Forestry Standard is essential to improve the resilience of forests, woods and trees.

Our shared long term vision is for our forests, woods and trees to be more resilient, and able to meet their full potential for a range of goods and services upon which we depend. This may mean an increase in forest cover, improved connectivity, greater diversity, or increased management intervention. The relationship between resilience and the economic value of trees and forests cannot be overstated: producing an income is vital to support active management, regular management

interventions offer opportunities for increasing diversity of tree genotypes and stand structure, and high resilience is likely to improve long-term productivity. Wider economic benefits of woodland management to society are often unrecognised financially, yet it is critical to woodland resilience that these benefits are acknowledged and rewarded to safeguard their continued delivery. To deliver this vision may involve significant change to widely accepted and practised systems of woodland and land management. Examples include adopting a broader range of species, less emphasis on even-aged silvicultural systems, and raising awareness that non-intervention may not promote ecological resilience in the long-term. Change at this scale is a long-term goal that needs a consistent, supportive policy framework and aligned incentives, and markets for woodland products and services, together with focused research, education and training.

We recognise the value of working collaboratively to deliver our shared vision of more resilient forests, woods and trees. This means a willingness to share information and good practice, coordinate efforts with others, pool ideas and resources where appropriate, and adopt a positive, pragmatic attitude to the efforts of others. Many successful programmes of work already exist and these need to be sustained and built upon. We believe that a coherent and joined-up approach across the sector including forging new partnerships, where needed, will ultimately be more effective at communicating the vision to a wider audience. This will help to embed change at every level across the woodland, land management and tree health communities.

To meet our common vision we agree seven guiding principles.

1. There is no single approach that must be followed; different owners and organisations will apply the principles differently to meet their own objectives, which in itself will promote diversity and increase resilience.
2. All forests, woods and trees should be cared and managed for site-appropriate economic, environmental and social benefits, according to the guidelines of the UK Forestry Standard.
3. It is essential that our resource of forests, woods and trees continues to grow, expand and regenerate on a sustainable basis.
4. Action is urgently required to adapt to threats to our forests, woods and trees.
5. The importance and value of trees in the wider landscape, and the relevance of land management activities outside woodlands, should be considered fully.
6. Forest design and management should address the long-term projections for Britain’s future climate and take account of the inherent uncertainty of these projections, especially given the long-term nature of forest management.
7. Actions to improve adaptation should be based upon the best available evidence and the latest projections of climate change, to ensure that forests, woods and trees thrive in the future.

Signatories to the Accord

RFS ROYAL FORESTRY SOCIETY

CLA

LOCKHART GARRATT www.lockhart-garratt.co.uk

Forestry Commission England

Forest Research

SYLVA FOUNDATION

Confor Promoting forestry and wood

WOODLAND TRUST

THE MERSEY FOREST more from trees

Oakover Nurseries Great British Trees and Shrubs

Institute of Chartered Foresters

UPM

NATURAL ENGLAND

SmallWoods

TIMBER STRATEGIES

WOODLAND HERITAGE

CLIMATE READY

THE NATIONAL FOREST

the deer initiative mentor ceirw

TREESPLEASE www.treesplease.co.uk Tel: 01434 633049 Fax: 01434 636316

STOURHEAD (WESTERN) ESTATE

FUTURE TREES TRUST

TUBEX Advancing growth

Grown in Britain

Woodland Stewardship

SILVANUS

Cumbria Woodlands Working together to make our woods prosper

rural development initiatives

redroseforest

EGGER

SUSTAINABLE FOREST MANAGEMENT

the Forest of Marston Vale

THE CROWN ESTATE

Pryor & Rickett Silviculture

ZERO CARBON BRITAIN Centre for Alternative Technology Canolfan y Dechnoleg Amgen

Adaptation in Action

In support of the ‘Climate Change Accord’, a series of **Adaptation in Action** statements from a large number of organisations outlining their specific stance, activities and intended outcomes demonstrate their commitment to the ‘call for Resilient Forests, Woods and Trees’

Adaptation in Action: Country and Land Business Association

Our view of key issues

The agriculture, forestry and land use sector is one of the most exposed to climate change, but at the same time has significant opportunities to contribute to its mitigation. If forestry is to thrive and optimise its contribution to climate change mitigation then it is important that the sector implements adaptation measures that will secure its future.

The CLA and its membership recognise the importance of climate change and the need for adaptation and the CLA is actively engaged in policy discussions and development to encourage and facilitate the necessary changes. Climate change adaptation and mitigation is a core part of the CLA work.

Climate change is likely to impact negatively on forests and woodlands in England and Wales. The incidence of drought, heat stress, wind and storm damage, flooding, disease spread and fire are all increasing. However, the CLA's work on this topic is not just confined to how forestry can adapt to climate change but also how trees and woodland can help the wider landscape adapt to our changing climate.

How we are adapting and supporting adaptation

The CLA has taken a lead in investigating the role that rural land use plays in climate change and how adaptations to land management can mitigate climate change and strengthen resilience to its impacts.

Climate change features prominently in the CLA Forestry Policy. We recognise it will be a major influence on how land is managed in the future and make the following commitments:

- The CLA will keep members informed of the recommended practices to adapt to climate change to minimise the effects on their forest and woodland, particularly in relation to new diseases and the potential need to consider a change in species mix.
- The CLA will make the case for the valuable role that trees, woods and forests play in climate change mitigation.
- Forests and woodlands play an important role in water management. In partnership with others, the CLA will continue to investigate how this role could be enhanced and how best it could be delivered.
- The CLA will lobby for a policy framework which makes tree planting an attractive choice for landowners and encourages forestry and woodland management.
- The CLA will promote the use of bio-diversity and carbon offsetting and payments for eco-system services as this can be a key way to attract private financial support for forestry, which we would expect government to favour.
- The CLA will be proactive in the development of strategies and practices that support the adaptation of woodlands to make them more resilient to the impacts of climate change.

What we are doing

As far back as 2006 the CLA initiated the CLIO Report Climate Change and the European Countryside, Impacts on Land Management and Response Strategies. Most recently the CLA under the auspices of the European Landowners Organisation, is preparing a paper 'Climate Change and the Rural Economy' for presentation to The United Nations Climate Change Conference, COP21, in Paris in 2015.

Specific to forestry the CLA is engaged with Defra, Natural England and the Forestry Commission on adaptation to climate change policy.

The CLA disseminates information on climate change adaptation measures to its membership through the CLA Game fair, the CLA magazine and regional events.

As part of its delivery of these commitments the CLA chairs the sector's Forestry and Climate Change Adaptation Group.

Our intended outcomes for 2020

We have managed to communicate to members the importance of making the changes to their woodland management practices necessary to make their woods more resilient and the actions they should be taking.

CLA members have started adapting their woodlands and improving their resilience to the impacts of climate change.

We have persuaded FC and Defra to use the mid-term review so that measures to assist owners to adapt to climate change are better supported within Countryside Stewardship.

We have managed to reach a better agreement on the species to plant not only in new woodland but also when adapting ASNW and SSSI woodland.

www.cla.org.uk/

Adaptation in Action: Forest Research

Our view of key issues

The changing climate is affecting our trees and woodlands; for example pedunculate oak trees come into leaf nearly a month earlier than they did in 1950. The projected increases in temperature, changes in the seasonality of rainfall and increased frequency of extreme events present a challenge for forest planning and management. The incidence and severity of tree pest and disease outbreaks will continue to increase and changes in climate will heighten the risk of windthrow. Drier, warmer summers increase the risk of fire and may reduce tree growth. Those forests with uniform-aged stands of single or a few tree species will be at greater risk than more diverse forests.

The changing climate also presents new opportunities, as less known species will become more suitable. New woodlands are being planted to sequester carbon and provide shade, shelter and cooling. If we wish to produce timber for future generations and continue to benefit from the services provided by our woodlands, they need to be resilient to the impacts of climate change.

Forest owners and managers face big questions about how to respond and how to make decisions despite the uncertainty. We believe adaptive management and contingency planning are essential, given the long-term nature of forestry.

How we are adapting and supporting adaptation

We work to protect and expand Britain's forests and woodlands, and increase their value to society and the environment, through research and the application of scientific knowledge. Our research programmes for the Forestry Commission for 2015-2019 are centred on research to improve forest resilience, and include extensive provision of information, advice and tools to understand needs and support adaptation measures. The work will inform the forestry sector, support policy, and improve practice.

What we are doing

Our current research programmes will help quantify risks and identify new options for forest management in the face of climate change.

We participate in national and international trials of new species which are vital to find out what grows best in climates that may be ours in future. We continue long-running forest environmental monitoring work to detect and understand risks and changes, such as the work at Alice Holt Forest.

We have developed Ecological Site Classification (ESC) to aid decisions about tree species. ESC shows how they would perform at any given location in the climate projected over the next century. Other tools inform contingency planning such as ForestGALES which enables managers to estimate the probability of wind damage.

We work with forest planners in Aberfoyle to understand how the changing climate will impact species suitability and ecosystem services provided by Queen Elizabeth Forest Park. We have modelled a range of management options which reduce the risks and could continue to provide the long-term objectives for the forest.

We have developed publications, internet resources and knowledge exchange workshops to keep the wider forestry sector up to date.

Our intended outcomes for 2020

We continue to innovate to help prevent, manage and minimise damage from pest and diseases.

Our science supports the forestry and land management sector to make essential adaptation decisions. We build our research into accessible adaptation tools and manuals for the development of climate resilient forestry.

Close working relationships between scientists and the forestry sector enable the latest thinking on improving resilience to be shared and integrated.

New woodland planting and management are informed by the latest research to make them as resilient as possible.

The need for adaptive forest management is recognised and adopted across British forestry.

Our research on climate change adaptation can be found on the FR website: www.forestry.gov.uk/fr/infd-9m2kts.

Adaptation in Action: Forest Services

Our view of key issues

There is insufficient species diversity in woodland in England to accommodate the risks posed by a changing climate and the increasing number of pest and disease outbreaks.

In the absence of proactive work to increase the genetic diversity of tree species, native tree species will become increasingly unsuitable.

The fragmented nature of woodlands in England places England's woodland wildlife at risk.

The lack of management in many of England's woodlands is limiting evolutionary adaptation to climate change and the ability to intervene to increase resilience.

How we are adapting and supporting adaptation

As Government's forestry adviser and regulator, our priority is to encourage the forestry sector to increase the resilience of England's woodlands. This involves improving our understanding and evidence base.

What we are doing

We have set resilience and climate change adaptation as the bedrock of the Science and Innovation Strategy for British Forestry, providing the evidence for woodland managers to make pro-active choices to adapt to climate change.

We have established climate change adaptation as a requirement for receiving grant-aid through the UKFS's Forests and Climate Change Guidelines.

We have introduced the assessment of future climate risk to proposed planting stock in the validation process for the Woodland Carbon Code.

We are working with woodland owners and the Future Trees Trust to establish an improved resource of high quality seed stands in the UK.

We are encouraging the nursery sector to stock a wider variety of tree species and improved planting stock from more southerly origins.

We are actively engaging woodland managers to implement adaptation measures appropriate to their woodland type and management objectives.

We have developed guidance to support woodland owners in adapting to climate change.

We are challenging the status quo through active and open debate to highlight the risks that climate change presents to England's woodlands.

We are targeting the Countryside Stewardship woodland creation grant to create larger, more resilient woodlands, further develop woodland habitat networks and in locations where it will help to reduce flooding.

We are developing new funding models to increase the rate of woodland creation to enhance the resilience of the overall resource.

We have established a pro-active Woods into Management programme to improve the condition and resilience of England's woodlands.

Our intended outcomes for 2020

A greater variety of UK-grown tree species and provenances available in English nurseries – with woodland managers using adapted planting stock appropriately and with confidence.

A growing and robust evidence base and guidance being used by woodland owners and managers to inform planting, including situations where it is appropriate to plant more southerly seed origins as an adaptation measure.

Around 70% of England's woodlands in active management with increased levels of recruitment.

Active monitoring and management of any pest and disease introductions to minimise their impact on British woodlands.

At least 10,000 ha of resilient new woodlands have been planted through the Countryside Stewardship Scheme.

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Adaptation in Action: Lockhart Garratt

Our view of key issues

Lockhart Garrett (LGL) advises clients with property, assets and other interests in the rural land use and forestry sectors. These are sectors which potentially will be heavily exposed to the impacts and consequences of climate change. While there is clearly a need to adapt to those impacts, there are also opportunities for the sector to help reduce the impacts of climate change by reducing carbon emissions and, in-so-doing, developing the rural economy.

How we are adapting and supporting adaptation

Through its network of advisers, LGL provides woodland creation and silvicultural management advice to woodland owners, including on the use of Ecological Site Classification and climate change projections, restructuring and diversifying woodland structure, the use of alternative species and an awareness and reaction to the pest and disease threats exacerbated by climatic change. Our advice promotes resilience to climate change, pests and diseases and other threats to woodlands, helping to ensure that the woodlands of the East Midlands continue to thrive.

What we are doing

LGL is keeping clients informed on climate change issues and implementing best practice and current national guidance in response to climate change and the impacts it may have on clients' woodlands, land holdings and tree assets.

Our approach to increasing resilience is embodied in our advice to woodland owners to diversify woodland species mixes (species and provenance choice, planting patterns, woodland design and location) and structural composition (advocacy of natural regeneration, continuous cover forestry, shelterwood and selection-fell systems) in the interests of long-term woodland health and the protection of ecosystem service delivery.

To achieve our objective of delivering advice that will prove to be correct for those woodlands and their owners in the long-term, we are dedicated to a rigorous training programme of our staff in order to improve skills and understanding.

LGL recognises that sustainable silvicultural management interventions should be designed to increase a woodland's resilience to climate change. Similarly, a lack of woodland management is a serious threat to long-term economic and environmental viability and represents missed opportunities in climate change adaptation.

Our intended outcomes for 2020

LGL will continue to advise and issue best practice guidance and reflect the current scientific and industry consensus. Its consultants will continue to actively engage in Forestry Commission and other industry stakeholder (e.g. ICF, RICS, RFS, ConFor, CCFG and CIEEM) training events, CPD and meetings. LGL consultants are also involved in discussions within the industry to set and implement best practice.

LGL will advise clients to meet new woodland grant targets and carbon opportunities. Countryside Stewardship woodland creation grants incentivise the design of larger and more resilient creation projects and, through geographical targeting, promote their placement to help control long-term flood risks and develop habitat networks.

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Adaptation in Action: The Mersey Forest

Our view of key issues

Climate change is a significant threat to our social wellbeing and economic future, with impacts felt locally in The Mersey Forest, as well as globally. Trees and woodlands will be affected by changes in climate, and there is also a clear need for more trees and woodland to combat climate change.

Woodland creation is a highly cost-effective and achievable way to reduce carbon dioxide when compared to other sectors, and trees and woodlands help us to adapt to the predicted changes in climate.

How we are adapting and supporting adaptation

The Mersey Forest is a community forest established in 1991 with the vision to "get more from trees" to help make Merseyside and North Cheshire one of the best places in the country to live. We work with public and private landowners and managers in rural and urban areas to encourage, advise and support them to plant and manage trees, woodlands and associated habitats, as appropriate, on their land.

Through community and partnership working more than 9 million trees have been planted. Increased tree planting provides shade and evaporative cooling that help to keep neighbourhoods cooler, and ensure that towns and cities continue to be healthy, comfortable, and attractive places to live, work, visit and invest.

We work with communities who are learning how to make their area better adapted to the changing climate.

We stay informed of and contribute to research, such as ForeStClim, a project which explored how trees and woodlands can be managed in the face of climate change threats. The Sefton Coastal Woodlands have provided a case study on how woodlands can be managed to help local communities adapt to the impacts of climate change. In 2014 the woodlands were "highly commended" in the Royal Forestry Society Climate Change awards. The Mersey Forest is "climate twinned" with community forest partners, Pays de Redon, in North West France, an area whose current climate is similar to that projected for The Mersey Forest by 2040-2061. This allows us to consider how we may modify tree and woodland management to cope with future changes.

What we are doing

We undertake tree and woodland planting and management in accordance with the UK Forestry Standard, which has specific guidelines relating to climate change. This ensures that we meet all legal requirements and follow good practice. We will also continue to refine how we design, plant, and manage trees and woodlands so that they can withstand and thrive in future climates and continue to provide the many benefits they currently deliver. For example, we anticipate a change in planting and growing seasons, there will be new outbreaks of pests and diseases and we will need to ensure an adequate water supply so woodland can continue to provide evaporative cooling during periods of drought.

Our Intended outcomes for 2020

We will safeguard, plant and manage trees and woodlands for their role in climate change mitigation, adaptation, and resilience. We will work to ensure woodland can continue to provide ecosystem services, such as:

- urban cooling
- carbon storage
- flood alleviation and water management
- low carbon fuels and products
- sustainable travel routes and,
- opportunities for outdoor recreation

We will help wildlife to adapt to the changing climate.
We will design, plant and manage woodlands to increase their resilience to the impacts of the changing climate, such as outbreaks of pests and diseases.

Above all, we will promote the benefits of trees and woodlands in a changing climate, and encourage their creation for this purpose.

http://www.merseyforest.org.uk/

Adaptation in Action: The National Forest Company

Our view of key issues

The National Forest was initiated in the early 1990s to demonstrate the benefits that lowland forestry can provide when it is close to populations. Since 1995, the National Forest Company has led the creation of this new, multi-purpose forest for England, across 200 square miles of the Midlands. Through the creation and management of a mosaic landscape of woodland and other habitats, it achieves:

- Climate change adaptation and mitigation, including carbon abatement.
- The restoration of areas scarred by mining with community regeneration.
- Economic investment and business activity including a new visitor destination.
- A market for woodland products.
- Strengthened ecosystems: resilience and biodiversity gains through increased scale and quality of woodland and other habitats.
- Increased access and recreation opportunities.
- Enhanced quality of life, health, social cohesion and engagement for local communities / visitors.

The National Forest has always been about more than trees and is a national sustainable development exemplar.

How we are adapting and supporting adaptation

We are demonstrating successful adaptation and recognising the importance of:

- Promoting adaptation in urban and rural areas through planning policy, advice and response to planning applications – seeking up to 30% green and blue infrastructure with planning proposals and up to 100% with restoration of minerals sites.
- Taking a landscape-scale approach to adaptation through our strategies and plans, and through targeting of our grant schemes.
- Taking a partnership approach across the private, public and voluntary sectors.

What we are doing

We are increasing forest and woodland cover by converting a proportion of land to mixed woodlands. This is helping to:

- Create a more resilient landscape.
- Act as a buffer to help reduce the more extreme local effects on species and habitats.
- Filter pollutants and reduce soil erosion by wind and water.
- Provide shade to moderate temperatures in buildings (reducing energy costs) and ameliorate the impact of hot summers in urban areas.
- Contribute to flood alleviation measures through selective planting in flood plains.
- Prepare for increased storm damage and loss of old trees, by planting specimen trees in parkland.
- Improve forest and woodland management to create resilient landscapes and link woodlands to help species migrate to more suitable habitats.
- Increase awareness of climate change and encourage lifestyle changes, through education, e.g. half a million schoolchildren have benefited from education sessions in the Forest.
- Reduce and offset carbon by 'locking it up' for the future to improve our chances of adapting to climate change - 0.05% of the UK's carbon sequestration is provided by The National Forest.
- Promote the use of wood fuel as a carbon neutral energy source.

Our intended outcomes for 2020

Forest and woodland cover in The National Forest will increase to 25%, via forest creation, using our grant schemes, planning gain and direct land acquisition. This will increase the resilience of woodlands and their ability to continue to provide ecosystem services as a result.

Our work with landowners and advisers will improve active management of both young and mature woods. This will increase the resilience of the 10,000ha of forest and woodland through advice, information, training and grants. It will also support the effective management of pests and diseases, enhancing biodiversity and increasing productive use.

Working with communities and schools we will further increase the understanding of adaptation and support wider engagement in our woodlands.

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Adaptation in Action: Oakover Nurseries

Our view of key issues

Change in climate

As a business producing plants, the weather has a fundamental influence on how we grow our stock, the quality we produce and ultimately our profitability. We are noticing a change in weather patterns, with drier springs and wetter autumns becoming more common, alongside more frequent extreme weather events. We can only assume this will continue.

Change in species and provenances

Deciding which species to grow for expected demand two, three or four years into the future is always the biggest production dilemma facing a nursery; get it right and you satisfy your customers and are profitable, get it wrong, you burn plants and lose money. The encouragement of 'alternative species' and the use of more southerly provenances compounds this dilemma in the short-term, as the private sector is only starting to adopt a wider range of species into its main planting requirements.

How we are adapting and supporting adaptation

Based in South East England, the changing climate has already required us to take adaptation measures. We have and continue to review our water requirements, not only for field production, but for our container production.

We have also reviewed our lifting and plant handling capabilities.

The sourcing of high quality southerly provenances of certain species is being explored.

What we are doing

Three years ago we increased our field irrigation capacity by investing in a new five million gallon reservoir. The idea being that this would enable us to better manage drier springs and drought conditions by applying water when the plants require it to support continued plant growth.

The wet autumns have limited the number of plants we can lift and dispatch. Last season we doubled our lifting capacity by investing in two more lifting machines and we plan to buy another this year. This will allow a far greater number of plants to be lifted in a very short period of time when the conditions allow.

We have been buying seed from France for our ornamental species production for many years. We are now sourcing limited quantities of French provenance registered seed including Douglas fir (*Pseudotsuga menziesii), Lime (Tilia) and Oak (Quercus petraea, rubra* and *robur)*.

Our intended outcomes for 2020

2020 is not far away in plant production terms. We are sowing conifer seed in spring 2015 to sell in 2018. Assuming we see a move towards increasing demand for southerly provenance stock, we will continue to expand the volume of species and amounts we grow.

By 2020 we expect to have better defined the 'alternative conifer species' including the correct provenances to be grown.

Water requirement will continue to be high on the agenda, especially here in the South East. We will need to consider another field reservoir by 2020.

www.oakovernurseries.co.uk/

Adaptation in Action: Royal Forestry Society

Our view of key issues

The long-term health of Britain's woods and trees is threatened by rapid environmental change. We need to take action to increase the resilience of our woodlands so that they can better adapt to this challenge. This will require significant change to many well established and widely accepted woodland management practices. This will take time and will require a collective effort across the forestry sector to ensure this transition is well informed by available evidence, and all land-owners and managers are engaged in the process.

How we are adapting and supporting adaptation

The RFS is the largest and longest established education charity dedicated to promoting the wise management of woods and trees in England, Wales and Northern Ireland. We have a vital role to play in raising awareness and understanding of the importance of adapting our woods to cope better with the threats of pests, disease and climate change. We are well placed to disseminate practical and applied knowledge to all those with an active interest in woodland management and to educate the general public.

The RFS directly supports and encourages a healthy woodland sector. We believe that ecological resilience must go hand in hand with the long-term financial sustainability of our woods, and these twin objectives are entirely aligned. Our long-term aspiration is to see all woodland in Britain brought back into management and managed well. We believe that well managed woods will adapt better to a changing climate, and support both woodland ecology and wider landscape adaptation, compared to unmanaged or under-managed woodland.

What we are doing

In 2014 the RFS ran the Excellence in Forestry Woodlands for Climate Change Award with the support of FC England and Climate Ready. In 2016 we launch an Excellence in Forestry Resilient Woods Award category to run for five years.

Hosting the RFS and Woodland Trust national conference: *Resilient Woodlands: meeting the challenges*, intended to raise awareness of the issues and offer practical advice to all those with an active interest in the care of trees and woods.

The RFS, with FC England, Forest Research and Sylva Foundation, is a partner in Silvifuture (www.silvifuture.org.uk) a network established to promote and share knowledge about novel tree species across Britain. An online database enables woodland owners and forestry professionals to add, search and share information of more than sixty tree species, many of which are less well known or tested in Britain.

The RFS, with support from selected forest nurseries, FC England and Tubex, launched Conifers for Colleges to raise awareness of the value of conifers and their role in a resilient landscape and to establish a long-term research project to assess the performance of a wide range of alternative conifer species, with results fed into the SilviFuture database. There are five participating colleges so far.

The RFS owns three demonstration woodlands. They are managed to balance commercial, environmental and public access objectives. Hockeridge and Battram woods have a wide mix of conifer and broadleaf species and our Leighton redwood grove is one of the largest and oldest of its kind in the country. All three represent an excellent research and learning opportunity for woodland owners engaged in adapting their woods to climate change.

The RFS is launching a scheme to support new woodland owners to bring their woods back into management by offering them the opportunity to meet with experienced woodland managers to provide initial advice and guidance.

The RFS disseminates knowledge and insight about all aspects of woodland management online (www.rfs.org.uk), in print (QJF) and face to face (80+ woodland events a year). This knowledge transfer process regularly features news, research and information about all aspects of the adaptation challenge.

Our intended outcomes for 2020

A substantial increase in the proportion of woodland under management, supported by well-informed advice and encouraged by strong domestic demand and prices for UK produced wood products.

Diversity of species and genetics within species, including non-native species, accepted as the norm not the exception and based on best available evidence.

More widespread application of sound silvicultural and ecological practices consistent with principles of adaptation and production of quality timber.

A substantial reduction in the adverse impact of pests such as the grey squirrel and deer on woodlands as a result of more widespread application of better control methods and landowner collaboration.

More skilled people seeking careers at all levels in forestry to support the increased level of activity which this journey demands.

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Adaptation in Action: Sylva Foundation

Our view of key issues

Lack of management in privately-owned woodlands is almost certainly limiting the capacity of these important habitats to adapt to change, and is likely to limit society's sustainable development.

Poor understanding of woodland owner aspirations, actions and, importantly, barriers to better management undermines the ability of the forestry sector to encourage positive behavioural change.

Lack of diversity in forest design and management is a high risk strategy, which is failing to consider fully the projected impacts of environmental change, especially from pests and pathogens.

Current policies and practices that constrain the range of tree species, and their genetic origin, may reduce resilience of woodlands facing climate change.

How we are adapting and supporting adaptation

The Sylva Foundation aims to influence policy and practice across the UK by working with stakeholders, especially private woodland owners and agents. It is also proactive in developing a robust evidence base to help inform wise decision making.

What we are doing

Sylva supports a graduate scholarship at the University of Oxford on the theme of 'productive and healthy forests'. The current Oxford-Sylva scholar is investigating the ecological impacts of ash dieback.

We are a main partner in the Defra-funded Living Ash Project that aims to identify ash trees with tolerance to ash dieback for a breeding programme: www.livingashproject.org.uk. Sylva are also involved in an informal citizen science group for tree health monitoring.

We are a lead partner in supporting SilviFuture: a network promoting the gathering and sharing of information about novel forest species. www.silvifuture.org.uk

We collect evidence on the state of woodlands and the actions and aspirations of their stewards via the British Woodlands Survey (BWS). The information assembled helps inform policy and practice. In 2015 we are co-ordinating a BWS on the theme of Resilience. Outcomes from BWS2015 will feed into the Government's National Adaptation Programme. www.sylva.org.uk/forestryhorizons/bws

Through the *my*Forest Service we support more than 2,650 owners and agents in managing forests in line with the UK Forestry Standard. We provide online mapping tools and a UKFS-compliant management planning template, linked closely to Forestry Commission England requirements. We are working to secure similar synergies for Scotland and Wales. www.sylva.org.uk/myforest

The Woodland Star Rating – provided as part of the *my*Forest service – provides an easy-to-use self-evaluation tool for woodland owners and managers to assess progress towards managing a woodland according to the UK Forestry Standard. www.sylva.org.uk/myforest/wsr

We are a key partner in the University of Oxford's EU-funded project, NaturEtrade; an ecosystem assessment tool that connects businesses seeking to sponsor good land stewardship with land owners seeking financial assistance to improve land resilience. www.naturetrade.net

Our intended outcomes for 2020

The majority of privately-owned woodlands are brought into good condition according to UKFS. We aim to support at least 10% of private woodland owners in the UK via the *my*Forest service.

The British Woodlands Survey series will support further the development of targeted advice, policies and instruments for woodland owners/managers. Forest policy development will be based upon sound evidence and knowledge, including from stakeholders.

Innovations in timber engineering and wood-based design will stimulate markets, advancing the economic rationale for good woodland management.

www.sylva.org.uk

Adaptation in Action: UPM Tilhill

Our view of key issues

With world trade bringing more exotic pests and diseases closer to our door, climate change is ever more apparent; pests which would once have perished now survive and stormier weather patterns are taking their toll. The perception that the UK forest industry has 'too many eggs in one basket' when it comes to our lack of variety of commercial tree crops has led to recent concerns that our practice needs to take these issues into consideration in planning future forest management. This is reflected in UKFS and promoted widely.

We have witnessed the impact of environmental change first hand, in areas where pests and diseases have flourished. For example:

- Loss of larch through Phytophthora ramorum in the west.
- Signs of Acute Oak Decline in the Midlands.
- Loss of Corsican pine through Dothistroma (red band) needle blight in the east.
- Dieback of ash due to Chalara coming in from the near continent to the south east.

In order to address these types of occurrences, the industry needs to rigorously assess the risks to what we grow and how we grow it and look to what climate our rotations may have to cope with in the decades to come. Any changes to current forestry practice will impact on the *status quo*:

- Potential loss of productive area.
- Risk of changing timber quality.
- Pre-emptive management of diffuse pollution.
- A potential increase in establishment periods for some tree species.
- Future timber marketing challenges.

The way to manage these risks is through communication, sharing UK wide knowledge, full site and locality data and making recommendations based on sound research that will meet owners' objectives.

How we are adapting and supporting adaptation

UPM Tilhill look after a wide range of forest owners with an equally wide range of objectives, plans and visions for their businesses.

Our clients seek expert and professional advice and, as a Company, our first approach is to promote ICF status for all our forestry staff with continuous development at the core. Encouragement is also given to local learning and attending national workshops in order to help inform our staff and promote debate on subjects such as resilience planning, species diversification, pest and disease management and potential impacts of climate change.

Reducing the Company's impact on the environment is one of our key measured corporate policies. We practice energy conservation and promote sustainable waste management across all our offices.

We promote the use of improved planting stock to reduce rotation lengths and reduce the risk period inherent in our longer term forestry cycles.

What we are doing

All our woodland planning and operations have to be shaped within UKFS and, for many of the larger owners, within UKWAS. These frameworks require resilience to be considered and the potential impacts taken into account.

Due to our nationwide footprint, UPM Tilhill is acutely aware of the diversity of clients and owners' objectives. One size does not fit all. Our clients own their woodlands and their decisions are based upon our advice; trust is something we value highly.

Examples of our actions:

- Multiple types and sources of improved Sitka Spruce employed from Cornwall to North Scotland in 2014/15.
- Where appropriate, oak is employed with seed from Dutch and French select stands, having been grown in Britain.
- Innovative woodland creation on large scale investments are supported by Ecological Site Classification models for a wide range of species that meet the owners' objectives.
- Widespread UK and multi-ownership knowledge pool through both the UPM geographic coverage and the 200,000Ha group and resource UKWAS schemes with in-house auditors.
- Driving forward regular environmental protection good practice for managers and contractors alike.
- Colwell Woodlands was a winner of the Devon County Show Woodland competition for removing rhododendron to reduce the risk of *P. ramorum* spread and promote environmental resilience.

Our intended outcomes for 2020

We will be leaders in Bio-security for all of our operations.

We will be leaders in proactive measures to combat diffuse pollution.

Our determination to maintain and improve our professional standards will ensure our continued commitment to the Institute of Chartered Foresters and for continuous improvement of our staff.

We will advance our knowledge of alternative species and create more demonstration plots around the UK to validate appropriate species, so that we can provide more professional advice on species choice.

We will reassess rotation lengths. Shorter rotations and more Short Rotation Forestry are likely responses to increased uncertainty.

We will continue to deliver each of our forest owners' objectives, taking full account of changing constraints.

We will continue to play our part in attracting further inward investment into the forest industry.

www.upm-tilhill.com/

Adaptation in Action: Woodland Trust

Our view of key issues

We see resilience as the ability of landscapes to absorb pressures and change, recover and sustain ecological and social functions. This involves maintaining a diverse array of species and providing things we need for our wellbeing.

Actions for resilience are often focused on just the trees. However, this is only meaningful in the context of overall adaptive change and survival of the complete forest system which supports production of both market products and wider ecosystem services. Our approach to resilience is based on:

- creating the conditions for adaptive change;
- reducing or mitigating the threats.

We have identified a number of broad principles:

- Woodland should be buffered against negative external edge effects.
- Connectivity between trees, and woods, and other habitat should be increased.
- The range of native species in new and existing woodland and trees in the wider landscape should be increased, subject to suitability for the site.
- Gene flow and generational turnover in woods should be promoted.
- Structural diversity of woods and trees in the wider landscape should be promoted.

How we are adapting and supporting adaptation

Resilience is the major theme of our new strategic plan. We are adopting specific measures in the management of our own estate to ensure generational turnover through targeted intervention, and to reduce the threats from pests and diseases. We will work with other woodland landowners to tackle threats such as deer, at a landscape scale. We will promote connectivity in the landscape through both woodland creation and the management and expansion of tree cover in the wider landscape, including integration of forestry and farming systems.

Our policy work and work with local government, corporate business and other partners will advocate measures for the use of trees in wider climate change adaptation in both the rural and urban landscapes.

We will actively encourage and support the considered management of trees and woodland to ensure opportunities for adaptive change are realised and to respond to threats from the changing climate.

What we are doing

Amongst other things, we are supporting research through universities, including Birmingham Institute of Forestry and Harper Adams University to address gaps in evidence in the role of trees in the development of resilient landscapes.

We host the 'Keeping Rivers Cool' project, aimed at supporting the adaptation of Britain's rivers to climate change.

We are partners in Observatree, a citizen science project to monitor the emergence and spread of pests and pathogens.

We are working with UK nurseries to source seed for UK grown native trees species. These will be either collected from seed trees in the wild or from newly established seed orchards, to help ensure adequate diversity for adaptation.

We are developing spatial targeting and practical interventions for landowners and woodland owners to counter the loss of trees to pest and pathogens, such as ash dieback.

Our intended outcomes for 2020

All our woods will have clear measures for increasing resilience, built into their management plans.

We will be working with the wider forestry sector to raise public awareness of the threat from deer and the need for active control of deer numbers.

We will have a secure programme for UK sourced and grown native tree species for woodland creation. We will create 500ha of new woodland each year on our own estate, support the creation of a further 1500 ha and planted 15 million trees outside woods.

www.woodlandtrust.org.uk/publications/2015/06/climate-change/

2015 BRITISH WOODLANDS SURVEY

Resilience: exploring adaptation to environmental change

A national survey running during the summer of 2015, is aiming is to help understand progress in awareness and actions in adapting to environmental change among woodland owners and managers (including agents), tree nursery businesses, and forestry professionals.

The survey will be live July 31st - September 15th.

Environmental change may mean any change or disturbance of the environment caused by human influences and/or natural ecological processes. As such the survey will be exploring climate change, pests, pathogens, flooding, wind and fire, and will be seeking to explore how resilient our forests are to change. The information gathered will be used by organisations, policy makers and researchers to help improve the resilience of the nation's forests. The results will inform the government's National Adaptation Programme.

The British Woodlands Survey 2015 on Resilience is supported by a very wide number of partners, with funding provided by the Forestry Commission and the Woodland Trust. It is hosted and co-ordinated by the Sylva Foundation.

Take the survey at:

http://sylva.org.uk/forestryhorizons/bws2015