

# Forest Research

## Corporate Plan

### 2016-2017

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## FOREST RESEARCH CORPORATE PLAN 2016-2017

### Our vision

To be recognised as one of Europe's leading providers of applied forest and tree-related science, forestry data services, policy evidence, technical development, specialist extension services and professional training.

### Our role

Forest Research is the Research Agency of the Forestry Commission and Great Britain's principal organisation for forestry and tree-related research. Forest Research is internationally renowned for the provision of science, research, evidence, data and services in support of sustainable forestry. Forest Research works for many Government departments, all the Devolved Administrations, forestry and land management stakeholders, environmental non-Governmental organisations and the European Union, amongst others.

### Our objectives

- To provide evidence and expertise to inform the development and delivery of UK, Welsh, Scottish and European forestry related policies
- To provide innovative applied research, development, monitoring, scientific services, forestry data services and professional training to UK, European and international forestry stakeholders
- To facilitate knowledge exchange directly, and/or in partnership with others, to UK, European and international audiences
- To be the preferred supplier to the UK, Scottish and Welsh governments for forestry science as a result of its quality of service, value for money and reputation with the sector
- To work in partnership with others to promote the development of the wider UK, Scottish and Welsh forest science and research capacity and capability in particular through staff recruitment, training and development

### Our priorities

Our work is founded on the principle that research and evidence are central to both informed forest policy making and sustainable land management practices.

Forest Research's science and business priorities are to provide the science and evidence to:

- Protect our trees and forests

- Enhance forest ecosystem & economic resilience and service provision
- Ensure sustainable management and adaptation of our forests to climate change
- Publish Official Statistics and effect knowledge exchange
- Grow our business

Forest Research (FR) currently receives Forestry Commission support to deliver elements of the ministerially endorsed Science and Innovation Strategy for Forestry in Great Britain (SIS, 2014). The SIS influences and guides our activities – for example the SIS reaffirmed our research priorities, the importance we give to interdisciplinary research, working in partnership and effective knowledge exchange. FR has seven research programmes that deliver the SIS. The programmes are detailed in **Appendix 1**. FR also receives direct income from the country-based Forestry Commission teams to support the work of the Inventory, Forecasting and Operational Support (IFOS) team in providing key operational and forest data. The remaining income comes from a range of other clients such as the Welsh and Scottish governments, research partners, private sector companies and European Union customers. FR's Business Plan is detailed in **Appendix 2**.

## FR Science Priority: Protect our trees and forests

Ensuring that trees and forests remain healthy and vigorous is vital to the long-term future of Britain's woodlands and forests. However, an increasing range of pests and diseases threaten tree health. These pests and diseases include Oak Processionary Moth, Acute Oak Decline, *Dothistroma* Needle Blight, *Phytophthora ramorum*, *Phytophthora austrocedrae*, *Hylobius* and *Chalara*. FR works closely with other research organisations, universities and forest owners to help deliver the evidence needs required by the UK and Devolved Administrations, and has an operational role in diagnosing suspected pests and diseases.

Under this science priority we will deliver parts of "Assessing resilience and sustainability of urban trees, woodlands and forests" (SIS Programme 1) that relate to defining resilience and its associated indicators and "Understanding tree health and threats to resilience" (SIS programme 2).

### Desired outcomes

A woodland resource and structure with more resilience to pests and diseases, a sector that is better equipped to take decisions and manage disease and pest risks, especially to key commercial conifer and broadleaved species and a public that is more informed, engaged and involved in monitoring the health and wellbeing of trees and forests.

## Key actions

- Extend knowledge of the composition and condition of urban forests across the UK by carrying out at least two collaborative i-Tree Eco surveys
- Analyse the diversity of *Phytophthora* species present at forest, woodland and public garden sites in Scotland and northern England
- Contribute to Phase 2 and Phase 3 projects in the Living with Environmental Change (LWEC) Tree Health and Plant Biosecurity Initiative (THAPBI)

## FR impact indicators

- Up-to-date guidance on managing forests for pest and disease resilience
- International co-operation on pest and disease research and risk monitoring
- More detailed understanding of disease biology and epidemiology
- A well informed and evidenced risk register for trees

## FR Science Priority: Enhance forest ecosystem & economic resilience and service provision

The changing climate and increasing global trade raise complex problems for the conservation of woodland biodiversity, the capacity of forests to adapt to climate change, the provision of environmental mitigation, and the susceptibility of trees and forests to pests and diseases. Ensuring that current and future woodlands can maintain or enhance the range of ecosystem and economic services they provide (such as biodiversity, recreation opportunities, timber, tourism and health benefits) is an important and demanding challenge. This area of activity includes using our hydrological expertise to help realise the potential contribution that woodlands bring to water quality, management and flood prevention.

Under this science priority we will deliver the remaining elements of "Assessing resilience and sustainability of urban trees, woodlands and forests" (SIS Programme 1) and "Valuing ecosystem services, forest governance and influencing behaviour" (SIS Programme 4).

## Desired outcome

A woodland resource with the scale, design and structure to deliver important ecosystem services into the future. A sector that is better equipped and informed to take decisions over uncertain futures and implement appropriate design, planning and management systems.

## Key actions

- Prepare a National Forest Inventory Report on the extent and condition of woodland habitats
- Report the results of collaborative work on genetic variation in Scottish provenances of Scots pine
- Highlight FR's expertise in hydrology through reports and knowledge exchange activities regarding: long-term studies into the effects of conifer afforestation on water quality; managing riparian woodland for water and; modelling to predict the impacts of woodland creation and replanting on flood flows
- Contribute to a special edition of Ecosystem Services Journal as part of the dissemination of the UK National Ecosystem Assessment

## FR impact indicators

- Quantification of, or indicators for, forest based ecosystem service provision and resilience
- Improvements in woodland biodiversity
- Availability and use of up-to-date guidance on forest ecosystem services and resilience

## FR Science Priority: Ensure sustainable management and adaptation of our forests to climate change

The successful establishment of appropriate species and their sustainable management are vital if woodlands are to support the contribution of forestry and the wood processing industry to a growing economy. Furthermore, in response to both broader societal demands being placed on forests and increasing biotic and abiotic risks, the range of tree species and forest management systems is becoming more diverse. There is a consequent need, from both forest policy and operational perspectives, for greater understanding of the impact of these species and systems, and accurate models of current and future forest growth.

The work of the National Forest Inventory (NFI) and Statistics teams supports the provision of up-to-date information regarding trees and forests. The NFI is a multi-purpose programme that provides accurate, up-to-date information about the size, distribution, composition and condition of British forests and woodlands.

Under this science priority we will deliver "Delivering resilient forests in a changing climate" (SIS Programme 3), "Tree breeding and developing sustainable markets, forest products and services" (SIS programme 5) and "Forest resource assessment, greenhouse gas balance and modelling" (SIS Programme 6).

## Desired outcomes

A woodland resource that is suited to present needs and growing conditions bearing in mind the anticipated changes in climate, a sector that is informed about species choice, site selection and sustainable management of the UK's woodland resource, and wider appreciation of the role trees and forests have in increasing environmental resilience.

## Key actions

- Survey 1,500 hectares of forested land as required by the NFI
- Provide guidance on how to control the invasive shrub *Gaultheria shallon*
- Analyse the impact of policy, financial and operational interventions on wood mobilisation in Europe and produce summary reports
- Lead the forestry input to the preparation of the LWEC Report Card on the impact of climate change on UK agriculture and forestry
- Contribute to the updated UK Forestry Standard to be published in 2016-17

## FR impact indicators

- Up-to-date information and decision support systems on species choice and silvicultural techniques that reflect anticipated climate and disease conditions
- Availability and uptake of methods that enable accurate assessment and monitoring of forest resources at both GB and national levels
- Availability and use of models to forecast the carbon impacts of forest management, products and utilisation at a GB and European scale

## FR Science Priority: Publish Official Statistics and effect knowledge exchange

We are committed to ensuring that all our work continues to be relevant, available to, and understood by all those who need and use it. FR has a wide network of users and customers with whom we communicate and share our knowledge. We will continue to publish and disseminate our work to Government, research and professional networks, publish in peer-reviewed journals and open access sources, issue engaging and timely press releases and organise and participate in events with the forest sector. Under this science priority we will deliver "Integrating research for policy and practice to deliver resilient forests" (SIS Programme 7) and the knowledge exchange components of the other six SIS Programmes.

FR will, with others, play an important part in the updating of the UK Forestry Standard (UKFS). The UKFS is the reference standard for sustainable forest management in the UK. The UKFS, supported by its series of guidelines, outlines the context for forestry in

the UK, sets out the approach of the UK government to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring.

### Desired outcome

An engaged, informed and more diverse range of users of our information, including but not restricted to, the forestry sector.

### Key actions

- Make available selected datasets as our contribution to the Defra Open Data and INSPIRE programmes
- Increase FR's online portfolio of information, publications and data
- Publish UK National Statistics and Official Statistics releases on subjects including forestry statistics, timber price indices, UK wood production and analyses from the NFI
- Contribute to the delivery of partners' events including the Institute of Chartered Foresters' Conference; Association of Professional Foresters Show; Royal Welsh Show; International Union of Forest Research Organizations' Conference; and activities of the European Forest Institute
- Work with research partners to disseminate the results of national soil re-surveys that were undertaken to establish the effects of woodland creation and replanting on soil carbon

### FR impact indicators

- Feedback from private and public stakeholders and event participants about their use of our work
- Information on FR website statistics, including trends of website use
- Peer-reviewed publications which are accessible, with metrics on usage
- All publishing scientists have up-to-date information on their publications, as evidenced through ResearchGate (or similar recording mechanisms)

## FR Business Priority: Grow our business

FR has a proven track record of partnership working and we will continue to grow existing and new partnerships with sector-led initiatives, professional bodies, businesses, charities, universities, non-Governmental organisations and Government departments in the UK and across Europe. FR will also undertake specialist international work where it is profitable from a business or developmental perspective. FR will continue to work constructively with the UK and Devolved Administrations to facilitate their desire to



establish resilient future arrangements for forest research particularly in the context of the Scottish Government's decision to complete the devolution of forestry.

### Desired outcomes

FR will focus upon priority areas of research be they existing areas of expertise or new opportunities that build upon our proven skills and reputation. FR will continue to secure additional income from a wide range of customers and partners, both in the private and public sectors, in order to continue to grow our business and benefit its customers and the users of its expertise.

### Key Actions

- Continue to secure external income, with a target of £7.323 million from non-FC core funding
- Provide our staff with training and mentoring opportunities
- Integrate colleagues transferring to FR from Forestry Commission GB in April 2016 and raise awareness and understanding of each other's skills and capabilities
- Contribute to governance projects and spending reviews

### FR impact indicators

- External income secured
- Diversity and value of projects undertaken
- The number and range of PhDs/MScs supported
- Progress on determining agreed business models

## Appendix 1.

### Appendix 1: Working to the Science and Innovation Strategy for Forestry in Great Britain

FR has seven research programmes that deliver its contribution to the SIS. These programmes are:

#### 1 Assessing resilience and sustainability of urban trees, woodlands and forests

This programme includes the assessment and evaluation of resilience in the context of forestry and the wider mosaic of land use; what contributes to it, what are appropriate indicators of resilience, and what are the risks to and vulnerabilities of the forestry socio-ecological system. The 'system' approach will examine risks to both the functioning and state of the system (ecosystem services like timber production, recreation, Carbon sequestration, Carbon stock, water yield, shade, habitat, biodiversity, soil stability, nutrient cycling, greenhouse gas balance, climate change mitigation). The programme will include long-term monitoring of change in conditions or in state, and it will cover the social and organisational aspects of resilience (organisations, structures, cultures and networks) and examine indicators of social resilience in forest governance and management.

#### 2 Understanding tree health and threats to resilience

This programme focuses on pests, pathogens and invasive species, and will include research into the risks and vulnerabilities of trees and stands, breeding resistance, control and management strategies and the tree health advisory role. It will also cover the assessment of risks from climate change and pollution (drought, fire, floods, erosion, pollution damage, eutrophication), and dealing with uncertainty. This programme will also integrate the biotic and environmental aspects with understanding of social science, forest management and governance.

#### 3 Delivering resilient forests in a changing climate

This programme covers forest planning, infrastructure and silvicultural aspects of adaptation and adaptive capacity, at stand, forest and landscape scale, and includes organisational, professional and personal influences on decision-making and behavioural outcomes. The programme will produce recommendations on selection, diversification and/or breeding of species, provenances and genotypes; forest management systems, including on managing impacts on soil and water; management to support innovation; and the organisational and professional dimensions needed to adopt these recommendations. This includes methodologies for combining different knowledge and expertise to overcome barriers to implementation.

#### 4 Valuing ecosystem services, forest governance and influencing behaviour

This programme models and assesses the benefits, costs and services that both current and proposed future forests, can deliver. It will consider the evidence required to support forest expansion, and how this expansion can be achieved. The programme will involve the valuation of ecosystem services and natural capital research, the understanding and assessment of woodland expansion drivers and barriers (financial and policy etc.), and evaluation of specific benefits of woodlands and trees (timber, biodiversity, flood risk management, water resources, soils, pollution control, diffuse pollution, climate change mitigation and urban greenspace).

#### 5 Tree breeding and developing sustainable markets, forest products and services

This programme will characterise and understand the potential of the growing stock of forests to deliver products with a wide range of potential uses. It includes research on tree breeding, timber properties and their controls, and how they may be manipulated and improved to meet the evolving potential applications of wood as a resource. The research will cover relevant aspects of non-wood forest products, market analysis, supply chain management and innovation in the use of forest products.

#### 6 Forest resource assessment, greenhouse gas balance and modelling

This programme will undertake underpinning research for many other programmes. It will do this by developing methods, models and tools for data acquisition to enable the assessment of the status and development of forests, timber and biomass stocks, and the impacts of disturbances and interventions. The skills of the IFOS and Statistics teams are a vital component of this programme, as are the use of remote sensing and technical development. Long-term work includes the Permanent Sample Plot network and the valuable and numerous (nearly 2,000) research plots located in GB on both the private and public forest estate. The programme will play a pivotal role in forestry sector actions, both by providing the data and tools needed to inform and verify decisions about forest policy and practice, and in applying data and tools to support the formulation and implementation of policy and practice.

#### 7 Integrating research for policy and practice to deliver resilient forests

FR specifically addressed the needs expressed in the SIS for a more innovative approach to dealing with whole system issues. This programme will ensure multi/interdisciplinary working, and integrate various modes and disciplines of research to address the research challenges. It will facilitate the creation of a common conceptual framework across programmes, and both bring together different disciplines within FR and link science with policy and practice. It is a methodological programme which will build on current thinking around socio-ecological systems and other relevant whole systems approaches, and create a structure of workshops for internal and external stakeholders to integrate the research.

## Appendix 2.

### Appendix 2: Forest Research's Business Plan

**Table 1. Income and Expenditure 2015-2018**

	2015-16 Actual	2016-17 Planned *	17-18 Indicative **
<b>Income</b>			
FC Corporate and Forestry Support	7,556	8,946	8,976
Other Contracts	5,041	7,323	7,323
<b>Total Income</b>	<b>12,597</b>	<b>16,269</b>	<b>16,299</b>
<b>Expenditure</b>			
Staff Costs	7,734	9,765	9,795
Depreciation	693	652	652
Other Costs	4,252	5,852	5,852
<b>Total Expenditure</b>	<b>12,679</b>	<b>16,269</b>	<b>16,299</b>
<b>Operating Surplus/(-) Deficit</b>	<b>-82</b>	<b>0</b>	<b>0</b>
<b>Early Retirement Compensation</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Net Surplus/Deficit</b>	<b>-82</b>	<b>0</b>	<b>0</b>

\* includes IFOS, Statistics and Publications transferred from Forestry Commission 1 April 2016

\*\* pending approved budgets

**Table 2. Balance Sheet at 31 March 2016**

	2015-16 Actual	2016-17 Planned	17-18 Indicative **
<b>Non Current Assets</b>			
Property, Plant and Equipment	10,450	10,450	10,950
Other Assets	59	59	59
<b>Total Non-current assets</b>	<b>10,509</b>	<b>10,509</b>	<b>11,009</b>
Current Assets	1,968	1,968	1,968
Current Liabilities	-1,359	-1,359	-1,359
<b>Net Current Assets/(-) Liabilities</b>	<b>609</b>	<b>609</b>	<b>609</b>
<b>Total Assets less current Liabilities</b>	<b>11,118</b>	<b>11,118</b>	<b>11,618</b>
<b>Provision for Liabilities and Charges</b>	<b>-53</b>	<b>-34</b>	<b>-14</b>
<b>Taxpayers' Equity</b>	<b>11,065</b>	<b>11,084</b>	<b>11,604</b>

**Table 3. Cash Flow 2015-2018**

	<b>2015-16 Actual</b>	<b>2016-17 Planned *</b>	<b>2017-18 Indicative **</b>
Net Operating surplus/(-) deficit	-82	0	0
Depreciation	693	652	652
Changes in working capital	-92	0	0
Change in provisions	-129	-83	-38
<b>Cash inflow/(-) outflow from operating</b>	<b>390</b>	<b>569</b>	<b>614</b>
Less: Capital Expenditure	258	600	1,100
<b>Net cash inflow/(-) outflow</b>	<b>132</b>	<b>-31</b>	<b>-486</b>

**Table 4. Trends in Staff Numbers (full time equivalents)**

	<b>2015-16 Actual</b>	<b>2016-17 Planned *</b>	<b>2017-18 Indicative **</b>
<b>Total</b>	<b>178</b>	<b>216</b>	<b>216</b>

Enquiries relating to this publication should be addressed to:

Forest Research

Alice Holt Lodge

Farnham

Surrey GU10 4LH

T: 0300 067 5601

E: [research.info@forestry.gsi.gov.uk](mailto:research.info@forestry.gsi.gov.uk)

Contact this address if you would like to request this document in large print or alternative formats.

More information about Forest Research is available at:

[www.forestry.gov.uk/forestresearch](http://www.forestry.gov.uk/forestresearch)

Alice Holt Lodge  
Farnham  
Surrey GU10 4LH, UK

Tel: 0300 067 5600

Fax: 01420 23653

Email: [research.info@forestry.gsi.gov.uk](mailto:research.info@forestry.gsi.gov.uk)

[www.forestry.gov.uk/forestresearch](http://www.forestry.gov.uk/forestresearch)

Northern Research Station  
Roslin  
Midlothian EH25 9SY, UK

Tel: 0300 067 5900

Fax: 0131 445 5124

Forest Research in Wales  
Thoday Building  
Deiniol Road  
BANGOR  
Gwynedd LL57 2UW

Tel: 0300 067 5774