

Alice Holt Lodge
Farnham
Surrey
GU10 4LH

Tel: 0300 067 5601

Northern Research Station
Roslin
Midlothian
EH25 9SY

Tel: 0300 067 5900

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

Tel: 0300 067 5774

Email: research.info@forestry.gsi.gov.uk
www.forestry.gov.uk/forestresearch

Annual Report and Accounts 2016–2017

Forest Research Annual Report and Accounts 2016–2017



The Research Agency of the
Forestry Commission

Forest Research

Annual Report and Accounts 2016–2017

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Financial Statements: Ancient Caledonian pines beside the River Affric, Highlands, Scotland.

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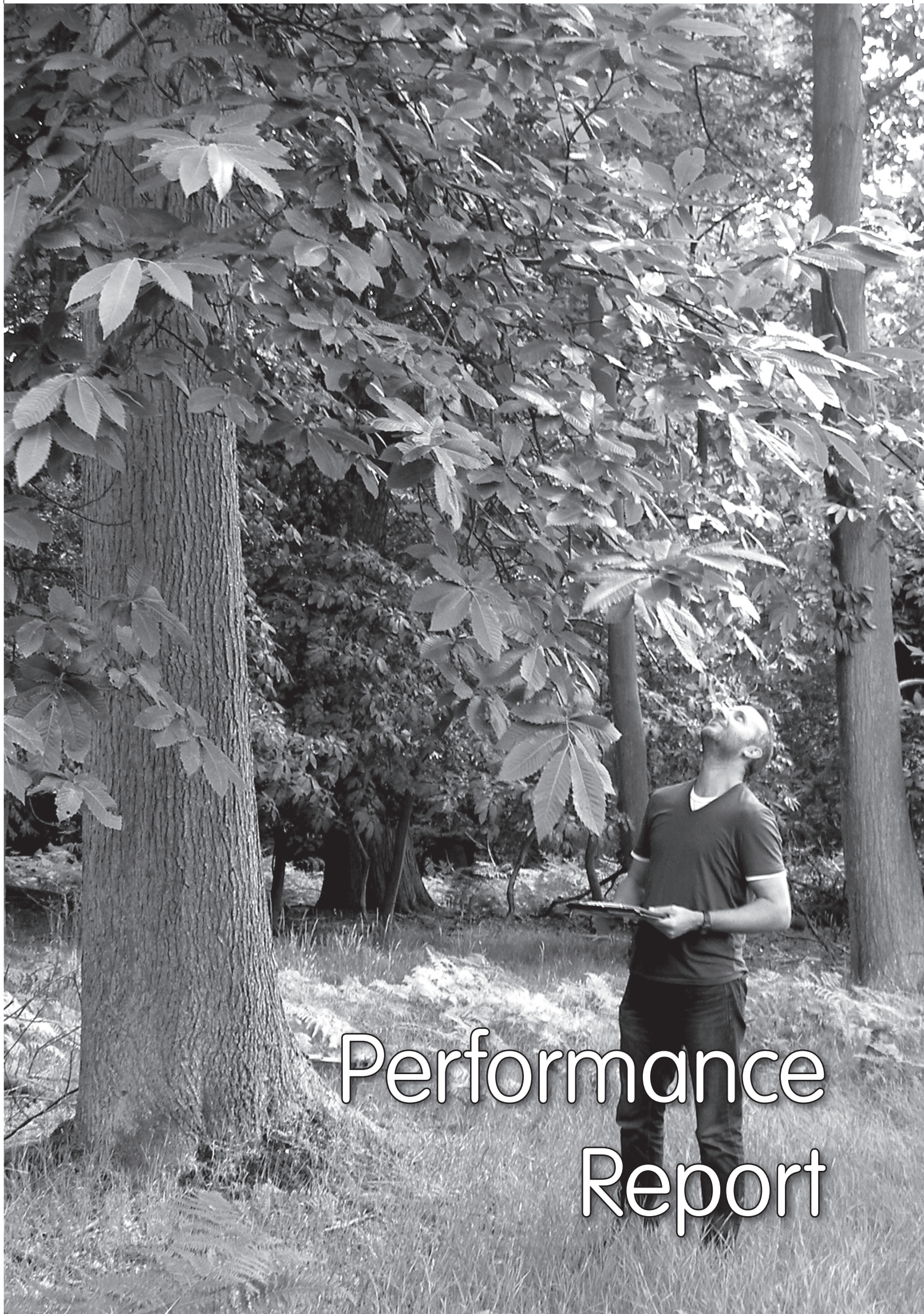
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Performance Report

Overview

Chief Executive's Statement

Forestry and the environment in which we operate never stay still, which is why Forest Research always focuses on the quality of the science we undertake and its practical relevance to our client base. Current challenges and opportunities include Brexit, the devolution of the Forestry Commission, changes in the research funding landscape, the impact of existing and new forest pests and pathogens, challenging new planting targets and the opportunities of landscape-scale woodland creation.

While we continue to adapt to our changing environment it is pleasing to note that Forest Research achieved or exceeded 21 Key Actions from our Corporate Plan for 2016–17 and in doing so secured £7.4 million of non-core income. This success is a direct result of the hard work and dedication of our staff and their commitment to developing effective partnerships and delivering for our clients across the UK public and private sectors.

The discovery of an outbreak of sweet chestnut blight (*Cryphonectria parasitica*) has led to the need for considerable work by our tree health advisory team alongside our colleagues in FC England, and their contribution has been acknowledged and welcomed by those affected by and dealing with the outbreak.

The same team has also been working on identifying the causal agent(s) affecting noble fir in Wales, following the discovery of a stand of affected trees in the Corris area in Gwynedd. The primary causal agent has now been confirmed as the fungus *Neonectria neomacrospora*. Historical records held by Forest Research indicate that this organism has been present on the same site since at least 1990 and in Britain for a considerably longer period – certainly since before 1961, when its existence in Britain was described in print.

As part of Forest Research's ongoing and extensive work on decision support systems, we have created a software tool called Forest Yield. This uses yield tables to predict forest growth in order to assist forest management in Britain. The PC-based model of tree growth is available for download, along with a user manual and handbook. We worked with the Forestry Commission to launch this decision support system at the Institute of Chartered Foresters' annual conference in April 2016. In addition, as part of our drive to reach a wider audience for our work, an article co-authored by Gordon Steward from Castel Underwriting Agencies and Forest Research's Bruce Nicoll was published in the insurance industry magazine *Insurance Day* in November. This article describes how Forest Research's ForestGALES decision support system can be used to establish a more accurate base for underwriting wind risks in the forest sector.

Forest Research is highly committed to supporting Defra's Open Data initiative and we were really pleased to have met the Forestry Commission's commitment to the initiative by publishing 250 datasets, well in excess of the target of 152, by the June 2016 deadline. This result underlies our ongoing support of the initiative and this will be reflected in how we plan our approach to data handling in the future.

In July we hosted an event at our Alice Holt site showcasing the work sponsored by Woodland Heritage and their great advocate, the late Peter Goodwin, especially the research on acute oak decline being undertaken by Forest Research's Sandra Denman, her team and many collaborators. The event also provided the opportunity for our Principal Pathologist Joan Webber to be awarded the Peter Savill Award – by Peter Savill himself – in recognition of her services to forestry.

Forest Research
always focuses
on the quality of
the science we
undertake and its
practical relevance

Forest Research staff also helped organise the ProSilva annual meeting at Stirling University in June 2016, which marked the 25th anniversary of the Continuous Cover Forestry Group in Great Britain. A total of 48 delegates from 23 European countries attended to visit continuous cover forestry sites in Scotland and discuss methods of management and the challenges ahead.

We published a number of key statistics publications during the year. These included *Woodland Area, Planting and Restocking: 2016 edition* (16 June), *Preliminary estimates of the changes in canopy cover in British woodlands between 2006 and 2015* (12 August), and *Forestry Statistics 2016* and *Forestry Facts & Figures 2016* (22 September), the last two providing detailed statistics on a range of topics relating to forestry. One key fact of interest is that the woodland area in the UK in 2016 was 3.16 million hectares, of which 1.35 million hectares (43%) of UK woodland area are independently certified as sustainably managed.

Also, despite 10.8 million green tonnes of UK roundwood (softwood and hardwood) being delivered from UK woodlands to primary wood processors and others in 2015, the UK was still a huge net importer of forest products in 2014, being the third largest behind China and Japan. This highlights the massive opportunity for the UK forestry sector and underpins the drive to plant more trees. It also shows the ongoing importance of supporting the continued development of UK forestry with good quality science and solid evidence. This will ensure we create resilient woodlands capable of supplying the whole range of services we have come to expect, from timber to recreation and biodiversity to improved mental health.

This highlights
the massive
opportunity for the
UK forestry sector

Many individuals and organisations have contributed to our success during the past year and I would like to thank them all for their continued and positive support, as well as thanking all my Forest Research colleagues for their efforts and contributions during the year.



Professor James Pendlebury
Chief Executive

Introduction to Forest Research

Background

Forest Research (FR) is the Research Agency of the Forestry Commission (FC) and Great Britain's principal organisation for forestry and tree-related research. FR is internationally renowned for the provision of science, research, evidence, data and services in support of sustainable forestry. FR works for many government departments, all the devolved administrations, forestry and land management stakeholders, environmental non-governmental organisations and the European Union, amongst others.

FR's 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.

FR's Strategic Objectives

1. To provide evidence and expertise to inform the development and delivery of UK, Welsh, Scottish and European forestry related policies.
2. To provide innovative applied research, development, monitoring, scientific services, forestry data services and professional training to UK, European and international forestry stakeholders.
3. To facilitate knowledge exchange directly, and/or in partnership with others, to UK, European and international audiences.
4. 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.
5. 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.

As part of the wider Department for Environment, Food and Rural Affairs (Defra) family, FR will help to deliver Defra's Strategy, which sets out a shared vision and set of objectives for the Defra group up to 2020. At the heart of the Strategy is a shared vision for the Defra group: creating a great place for living. Defra goals are focused on four impact objectives, which are to make a positive difference to the UK by 2020 by delivering a cleaner and healthier environment, supporting a world-class food and farming industry, supporting a thriving rural economy and protecting the UK against environmental damage. More information on the strategy is available in Defra's *Annual Report and Accounts*.

Research funding

Much of FR's work is funded by the FC with Corporate and Forestry Support (CFS) acting as purchaser of research and other services in support of the ministerially endorsed Science and Innovation Strategy for Forestry in Great Britain and forestry policies of the UK, Scottish, Welsh and Northern Irish governments. In addition, FC England, FC Scotland and Natural Resources Wales purchase research, data services and surveys specifically related to their respective forest estates. FR has also been increasingly successful in securing funding from other government departments, the European Commission, UK research councils, commercial organisations, private individuals and charities. Collaborative bids with other research providers and consortium funding have become increasingly important, placing emphasis on effective partnership working.

Activities

Research and development are essential components in delivery of the benefits of sustainable forestry in a multifunctional landscape. FR's research, surveys and related forestry data and scientific services address the social, economic and environmental components of sustainability. There is a focus on providing knowledge and practical solutions based on high-quality science, data provision and analysis.

Our projects provide understanding, policy advice and guidelines on the implementation of best practice (on issues such as forest hydrology, tree health, adaptation to climate change, continuous cover forestry, timber quality, land reclamation and the restoration of native woodlands). Much of the research is directed at increasing the many benefits of woodlands and their inherent resilience.

FR works closely with the FC, the European Commission and other international bodies to ensure compliance with international agreements on the sustainable management of forests and the delivery of social, environmental and economic objectives. The Agency also carries out work on genetic conservation, tree improvement, seed testing, method studies, product evaluation, crop inventory, forest statistics and data, surveys and monitoring.

Resources

FR employed 227 (full-time equivalent) staff during the year 2016–17 across England, Scotland and Wales. Contact information for our main offices is given on the back cover.

Performance summary

Operating review

During the past exceptionally busy year, Forest Research has:

- achieved or exceeded targets for all of our 21 Key Actions in our 2016–17 Corporate Plan;
- secured £7.4 million of non-core income;
- surveyed 1,930 hectares of forested land as required by the National Forest Inventory;
- supported FC England colleagues and landowners in dealing with an outbreak of sweet chestnut blight (*Cryphonectria parasitica*) in south-west England;
- identified the causal agent, the fungus *Neonectria neomacrospora*, affecting noble fir in Wales, following the discovery of a stand of affected trees in the Corris area in Gwynedd;
- hosted an event at our Alice Holt site showcasing the work sponsored by Woodland Heritage, especially the research on acute oak decline being undertaken by ourselves and our many collaborators;
- formalised our status as an affiliated institute of the University of Edinburgh;
- co-authored the Living With Environmental Change (LWEC) *Agriculture and forestry climate change impacts report card 2016* (and the underpinning technical papers), published in July;
- co-authored the forestry chapter of the *UK climate change risk assessment 2017 evidence report* launched on 12 July;
- hosted 25 early career scientists from across Europe and further afield who were participants at an international summer school about measuring and modelling greenhouse gas balances, a component of the NERC-funded Greenhouse Gas Programme;
- made available more than 250 datasets from the National Forest Inventory, Public Forest Estate and Research Experiments as our contribution to the Defra Open Data and INSPIRE programmes, well in excess of our initial commitment of 152 datasets;

- published a large array of UK National Statistics and Official Statistics on subjects including forestry statistics, timber price indices, UK wood production and analyses from the National Forest Inventory;
- co-authored a paper entitled 'Genome sequence and genetic diversity of European ash trees', published in *Nature*;
- worked with Forest Enterprise Scotland on developing the ArcGIS Online map app in support of the new Community Asset Transfer legislation <http://scotland.forestry.gov.uk/managing/get-involved/community-asset-transfer-scheme>.

Financial review

On 1 April 2016, Inventory, Forecasting and Operational Support (IFOS) and other FC staff transferred to FR, which increased our staff complement by 44 full-time equivalents and income and expenditure by £4,165,000 as the transfer was to be cost-neutral to FR. Hence there are significant differences between 2015–16 and 2016–17 staff numbers, income and expenditure. We have not repeated this explanation in the Remuneration Report or Notes to the Accounts.

Forest Research had net operating expenditure of £459,000 in 2016–17 (2015–16: £82,000). However, the FC has agreed to cover £131,000 additional depreciation costs incurred following transfer of IFOS and other staff, therefore net operating expenditure was £328,000.

Additions to fixed assets in the year were £2,006,000 (2015–16: £283,000), on essential infrastructure work (window and roof replacement at Alice Holt), scientific equipment and intangible assets.

Financial objective – Key Actions

Forest Research's primary financial objective set out in the Framework Document is to recover the full economic costs of its operations from the sale of services to customers. In 2016–17 the recovery rate was 97.9%, compared with 99.4% in 2015–16. However, if additional depreciation charges of £131,000 are excluded the 2016–17 recovery rate was 98.0%.

Performance against other operational, scientific and financial Key Actions is reported in the Performance Analysis on page 12. Forest Research achieved £7.404 million income from non-CFS customers against the Key Action target of £7.323 million.

Events after the reporting date

There have been no significant events since 31 March 2017.

The future

Our work is founded on the principle that research and evidence are at the heart of informed policy-making and sustainable land management practices. The government's Forestry and Woodlands Policy Statement (January 2013), the Welsh Government's Woodland Strategy 'Woodlands for Wales' (2009) and the Scottish Forestry Strategy (2006), and subsequent implementation plans, have helped shape our priorities, which are to provide the science and evidence to:

- protect our trees and forests;
- enhance forest ecosystem resilience and service provision;
- ensure sustainable management and adaptation of our forests to climate change;
- effect knowledge exchange;
- grow our business.

Some of the activities Forest Research will be undertaking to support the delivery of the Forestry Commission's Science and Innovation Strategy for Forestry in Great Britain, and to fulfil our own Corporate Plan objectives for 2017-18, are as follows:

- Carry out surveys and monitoring across the country as required under the EU Plant Health Directive to ensure that the UK retains Protected Zone status against regulated tree pests and diseases, and provide a report on these activities to the UK and EU statutory bodies.
- Provide expert diagnostic services, training and advice for TreeAlert, Observatree and the wide range of public and private stakeholders working with trees across the country.
- Report to Forest Services England on tree canopy cover in English towns and cities. Enhance our research and operational support to the development of the Action Oak partnership.
- Produce a report for Defra on three years' evidence of the ash dieback field trials, including the effect of seed source on survival.
- Co-organise, with the Forestry Commission, Forestry Commission Scotland, WWF and Confor, the New Generation Plantations (NGP) meeting in June 2017.
- Survey 1,500 hectares of forested land as required by the National Forest Inventory.
- Prepare a pre-consultation draft National Forest Inventory (NFI) report on the use of woodlands by the public.
- Publish UK National Statistics and Official Statistics releases on subjects including forestry statistics, timber price indices, UK wood production and analyses from the National Forest Inventory.
- Contribute to the delivery of partners' events, including the Institute of Chartered Foresters' Conference (Birmingham April 2017), Royal Welsh Show (July 2017), International Union of Forest Research Organizations' Conference (Freiburg, September 2017), the SIMWOOD Conference (Paris, October 2017) and European Forest Institute activities.

Supplier payment policy

Forest Research complies with the government's Better Payment Practice Code. Unless otherwise stated in the contract, we aim to pay within 10 days from the receipt of goods and services or the presentation of a valid invoice, whichever is the later. A sample analysis for 2016-17 indicates that 99.8% were paid within the due date. Arrangements for handling complaints on payment performance are notified to suppliers on contracts.

Auditors

These accounts are prepared in accordance with a direction given by HM Treasury in pursuance of Section 7 of the Government Resources and Accounts Act 2000. They are audited by the Comptroller and Auditor General, who is the statutory appointed auditor. The notional fee for statutory audit services in respect of these accounts was £35,000 (2015-16: £35,000). No further non-audit services were provided in 2016-17 or 2015-16.

Disclosure of audit information to the auditors

So far as I am aware, there is no relevant audit information of which the Forest Research auditors are unaware. I have taken all the steps that I ought to have taken to make myself aware of any relevant audit information and to establish that the Forest Research auditors are aware of that information.



Professor James Pendlebury
Chief Executive and Accounting Officer

6 July 2017

Performance Analysis

Key Actions

Forest Research's achievements on its Corporate Plan Key Actions for 2016–17 are listed below. A full commentary with details of our work on each Key Action is available at www.forestry.gov.uk/fr/keyactions

Key Action	Progress
Extend knowledge of the composition and condition of urban forests across the UK by carrying out at least two collaborative i-Tree Eco surveys	Exceeded: The Urban Forest Research Group has provided detailed support to four i-Tree Eco projects.
Analyse the diversity of <i>Phytophthora</i> species present at forest, woodland and public garden sites in Scotland and northern England	Achieved.
Contribute to Phase 2 and Phase 3 projects in the Living With Environmental Change (LWEC) Tree Health and Plant Biosecurity Initiative (THAPBI)	Achieved.
Prepare a National Forest Inventory report on the extent and condition of woodland habitats	Achieved.
Report the results of collaborative work on genetic variation in Scottish provenances of Scots pine	Achieved.
Highlight Forest Research'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	Achieved.
Contribute to a special edition of <i>Ecosystem Services</i> journal as part of the UK National Ecosystem Assessment dissemination	Achieved.
Survey 1,500 hectares of forested land as required by the National Forest Inventory	Exceeded: We have surveyed 1,930 hectares.
Provide guidance on how to control the invasive shrub <i>Gaultheria shallon</i>	Achieved.
Analyse the impact of policy, financial and operational interventions on wood mobilisation in Europe and produce summary reports	Achieved.
Lead the forestry input to the preparation of the Living with Environmental Change (LWEC) Report Card on the impact of climate change on UK agriculture and forestry	Achieved.
Contribute to the updated UK Forestry Standard to be published in 2016–17	Achieved.

Key Action	Progress
Make available datasets for the National Forest Inventory, Public Forest Estate and Research Experiment as our contribution to the Open Data and INSPIRE programmes	Exceeded: The initial scoping exercise was completed and subsequently >250 Forestry Commission spatial and non-spatial datasets have been made available (exceeds our initial commitment of 152 datasets).
Increase Forest Research's online portfolio of information, publications and data	Achieved.
Publish UK National Statistics and Official Statistics releases on subjects including forestry statistics, timber price indices, UK wood production and analyses from the National Forest Inventory	Achieved.
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	Achieved.
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	Achieved.
Continue to secure external (non-CFS) income, with a target of £7.323 million	Exceeded: Forest Research secured £7.404 million of external income.
Provide our staff with training and mentoring opportunities	Achieved.
Integrate colleagues joining Forest Research in April 2016 and raise awareness and understanding of each other's skills and capabilities	Achieved.
Contribute to governance projects and spending reviews	Achieved.

Research highlights from the past year

During 2016–17 staff from Forest Research have made important contributions to studies ranging from measuring forest canopy cover to monitoring pests and diseases. Some of the highlights are described below and further information is available at www.forestry.gov.uk/forestresearch

Estimating changes in woodland canopy cover

In April 2016, Forest Research took on responsibility for the National Forest Inventory (NFI), a programme that monitors woodland and trees within Great Britain. In August 2016 we produced an NFI report providing preliminary estimates of the changes in canopy cover in British woodlands between 2006 and 2015. As well as reporting net changes in canopy cover, this report, for the first time, separately identified gains and losses in canopy cover, which provide us with a much more detailed picture of what is happening to British woods.

Canopy cover is a subset of woodland area and excludes recently clearfelled and newly replanted sites. Changes in canopy cover can be permanent or temporary in nature and it is important to recognise and distinguish between these. Temporary changes in canopy cover arise from sustainable forest management practices where restocking follows clearfelling and natural events such as windblow. Permanent changes in canopy cover or type of cover result from converting woodland to other land uses such as built developments, restoring open habitat and creating new native broadleaved woodlands. Changes in the levels of canopy cover are complex, interrelated and take place over a number of years.

Britain's woodlands have been going through a period of restructuring and diversification. As the plantations created in the 20th century came to maturity and were clearfelled, the opportunity has been taken to adjust the balance between conifer and broadleaved species and open habitats. Taken alongside a broadening of forest management objectives and evolving forest management practices, the rate and type of canopy cover change has increased in recent years.

The process of producing the 2016 report used the 2006 NFI woodland map as a base (which shows the extent of woodland of over 0.5 hectare throughout Britain, and which was created from the interpretation of aerial photography). Changes in canopy cover were identified and quantified from satellite imagery from 2006, 2009, 2011, 2012, 2014 and 2015. This was supported by a network of 15,000 field sample assessments carried out between 2009 and 2015.

Highlighting risks and impacts of climate change on forestry

Forest Research led the forestry sector input for two important climate change publications in 2016. The publications were an independent report to government called the *UK climate change risk assessment 2017 evidence report* and the Living With Environmental Change (LWEC) *Agriculture and forestry climate change impacts report card 2016*.

The evidence report reviews and summarises the main risks and opportunities for the UK from climate change. It identifies priority risks where there is a need for more coordinated action within the next five years, including extreme weather, water shortages and risks to soils and biodiversity. The report also highlights the need to assess the threats from new and emerging pests and diseases, and invasive non-native species. The report was used by government to inform the second *UK climate change risk assessment* published in January 2017.

The LWEC report card summarises for a more general audience the evidence of how climate change is affecting and is likely to impact agriculture and forestry in the UK. The report card was supported by several detailed reviews written by scientists at Forest Research. The card assesses the level of scientific confidence in the predictions and, in the section on forestry, changes in biodiversity and changes in timber yield potential in the next 20–30 years are picked out as being very probable (yield is likely to increase in the cooler, wetter uplands of the UK but, in areas or for species that are sensitive to drought, there will be reduced growth).

Forest Research is continuing to investigate the risks, opportunities and impacts of our changing climate for the forestry sector and to develop evidence and advice that will help policymakers and land managers as they adapt to the changing climate. For example, through our work with ClimateXChange we are supporting the Scottish Government as it develops and implements policies to help Scotland adapt to the changing climate.

Early detection of tree health

Many of the benefits that society derives from woods and forests depend upon the health of the trees. Studying tree health and helping trees become more resilient to many threats – including climate extremes – are important parts of Forest Research's work. Recently, attention has focused on the unwelcome increase in outbreaks of new pests and diseases arriving through pathways involving plant movements.

Early detection gives the best possible chance of eradication and control. This requires maximising the number of people seeking to detect the organisms as well as improved diagnostics. Our tree health specialists have been engaged in many events to raise awareness amongst those working in the woodland sector and wider publics. Training has been provided to volunteers in the collaborative citizen science project Observatree, supported by a new set of field identification guides. Refinements to our online portal TreeAlert, our preferred reporting mechanism, also help respondents provide essential diagnostic information.

Enquiries to our Tree Health Diagnostic and Advisory Service have increased substantially in the past year. Reports in the nine months to 31 December 2016 were a third more than in the whole year 2015–16. Half of these reports came via TreeAlert, resulting in a noticeable improvement in data quality. The top host tree in the reports was ash (associated with concerns over ash dieback) and the second was cedar (due to the high incidence of *Sirococcus* blight).

The reporting led to early identification of, and action to control, a quarantine pathogen *Cryphonectria parasitica* (which causes chestnut blight), as well as several other unwanted organisms. Our briefings help inform decisions over appropriate actions and, by sharing understanding with colleagues in the UK and overseas, also help preparedness. We have participated in a number of technical workshops and led a diagnostic training event on the bacterium *Xylella fastidiosa*, organised in collaboration with SASA (Science and Advice for Scottish Agriculture) with funding from Defra.

The reports and detections also provide material for further research to understand the mode of action, life cycle and extent of new threats, and for the development of management or eradication strategies.

Remote monitoring of forest decline

Climatic change and trade have increased the number of pests and diseases threatening forests in Britain, and monitoring methods need to be timely and cost-effective to allow for effective management practices. Therefore, Forest Research set up a research programme to look at the use of earth observation techniques such as aerial or satellite imagery to detect early stress in trees which can then be investigated further on the ground. The programme is focused on three main areas of work.

The first of these is using thermal sensor imagery to monitor stomata activity. Stomata are the organs in the leaf that exchange water and carbon dioxide with the atmosphere. When plants are under stress they close their stomata earlier and this leads to less water loss and an increase in temperature. Work started with the EU-funded THERMOLiDAR project in 2013, and Forest Research has developed a model linking the imagery and tree stress, which can create a digital map for further investigation. Early but very promising results were presented at the ForestSAT 2016 conference in Santiago, Chile.

Plants under stress also increase the carotenoid composition of their leaves. Carotenoids regulate temperature and in sufficient quantity they lead to orange/red colouring, such as when they naturally increase each autumn. However, smaller increases may not be visible to the naked eye. We have therefore set up experiments with quarantined Japanese larch (*Larix kaempferi*) seedlings artificially inoculated with the pathogen *Phytophthora pseudosyringae* – chosen because it creates similar levels of stress to *Phytophthora ramorum* but its use is not

restricted – and are monitoring and calibrating their stress levels using non-visible wavelengths of light such as near and short-wave infrared. These experiments are continuing and we hope later in 2017 to publish results on using remote imagery to provide early detection of anomalous carotenoids as a proxy for plant stress.

Forest Research has also been involved, together with Swansea University and the US Forest Service, in time-series analysis of more than 40 years of Landsat satellite imagery. By processing the Landsat images in the super-computers at Google Earth Engine we can use vegetation indices such as water content and defoliation to identify changes in the vegetation over time. These results can also be used to update the National Forest Inventory data. This work will be supplemented with additional Sentinel-2 satellite earth observation images in 2017.

Partnership working for priority ecosystems

Over the last year, Forest Research has been working as part of a multi-partner project (with Scottish Environment Protection Agency, Forest Enterprise Scotland, Scottish Natural Heritage, Loch Lomond & The Trossachs National Park Authority and the Community Partnership) to trial an approach for developing sustainable and resilient land and water management solutions for Strathard, a rural area in the Loch Lomond & The Trossachs National Park, Scotland.

Within the project 'Strathard – a landscape to live, work & play' we collected, collated and analysed detailed local knowledge and information required to model and map opportunities for a number of land management actions, such as flood management. We took account of different stakeholder and local community group views which the partnership has collected through interviews, local events, workshops, an online survey, and an innovative interactive participatory mapping tool called Map-Me. Alongside this, we modelled ecosystem condition and ecosystem service provision, using recognised international criteria.

The modelled outputs were combined and used to target areas for priority management actions. For example, we identified candidate sites for natural flood management measures, such as leaky woody dams and flood storage areas. The modelling enables us to combine local knowledge and concerns with hydrological models and expert opinion in a quantifiable way. The opportunity maps will help partners and the community better understand catchment processes and where potential measures may be targeted to provide the most benefit to the community. We plan to set up a natural flood management demonstration site and to present the results of our wider analysis to the community via workshops and an online ArcGIS Story Map.

Encouraging tree planting for water quality benefits

There is growing support for the use of tree planting in areas where it can intercept and reduce the flow of diffuse pollutants (such as nitrate, phosphate and pesticides) from agriculture into water. However, the costs to landowners and uncertainty about the effectiveness of tree planting in providing water quality benefits have limited its use.

Since autumn 2016, Forest Research has led the creation of a European-wide network (PESFOR-W) to understand better the impacts of woodlands on water quality and to investigate how 'payments for ecosystem services' (PES) schemes can be developed to provide cost-effective solutions. PES schemes are flexible, incentive-based mechanisms that could play an important role in encouraging landowners and managers to plant trees to help improve water quality.

PESFOR-W is drawing on expertise from 37 countries in forestry, agriculture, water and environmental economics to collate case studies and learning from existing 'woodlands for water' PES schemes. It is also creating a European-wide network through which such PES schemes can be encouraged, extended and improved, for example by linking existing payment schemes for other ecosystem services such as carbon storage.

Forest Research is leading the work to assess the effectiveness of woodland creation measures to reduce diffuse pollution and to provide a methodology and guidance on the data and models that will inform assessments of the cost-effectiveness of woodlands for water PES schemes. We are also considering the possible wider impacts of tree planting on water resources, particularly the ability of woodland creation to affect water use and storage, and how these might be influenced by climate change.

Studying the effects of afforestation on soil carbon sequestration

Growing trees can help to mitigate climate change by sequestering carbon not only in the wood, but also in soil, making a significant contribution to meeting the UK Government's greenhouse gas emission reduction targets. However, different soil types have different properties and levels of carbon, and respond differently to forest establishment. As a result, more information is needed to know where best to focus efforts on future afforestation for carbon balance purposes, and to shape policies that support woodland creation targets.

To date, there are insufficient measurements to be able to confidently quantify the soil carbon changes during past afforestation and subsequent forest rotations, partly because of the difficulties of detecting relatively slow changes in heterogeneous soils. Measurements during the whole life span of forest ecosystems are usually not possible, so quantification of carbon storage changes following afforestation is often carried out using a chronosequence approach (studying forests of different ages and rotations).

Over the past year, soil scientists at Forest Research have been carrying out soil carbon measurements across two large forest chronosequences on mineral-heavy clay soils under oaks (*Quercus robur*) at Alice Holt in Surrey and on organo-mineral soils under Sitka spruce (*Picea sitchensis*) at Kielder Forest, Northumberland. Combined with an assessment of soil carbon stocks from the previous land use, these studies have quantified the effects of changing the land use to forestry.

The study on mineral soils confirmed the positive increase of soil carbon under forest over approximately 200 years. Meanwhile the evidence from the study conducted on upland peaty gley soils under Sitka spruce suggested that afforestation over approximately 100 years (two rotations) conducted according to sustainable forestry principles will not have a negative impact on overall soil carbon stocks. A separate, longer-term study is underway at Llyn Brianne in Wales to check the impact of recent conifer harvesting and subsequent restocking on soil carbon.

Forest Research has also commissioned collaborative projects with Cranfield University and the James Hutton Institute on resampling the soils at sites from the English, Welsh and Scottish soil surveys which changed land use to forestry over the last 30–40 years. The results of these two projects are available online and provide further insights into the sequestration potential of woodland soils. For more information, visit www.forestry.gov.uk/fr/afforestationandsoilcarbon

Sustainability Report

This report is not subject to audit

The following table gives information on travel, energy usage, waste and water. Figures for 2016–17 are compared with previous financial years. This report has been prepared with reference to *Public Sector Annual Reports: sustainability reporting guidance 2016–17*.

Our average number of full-time equivalent staff increased from 178 in 2015–16 to 227 in 2016–17 when colleagues from Inventory, Forecasting and Operational Support (IFOS), Statistics and Publications teams joined FR. The figures for this year are taken as a new baseline for the Agency and will be used as a basis for monitoring and evaluation in future years. We remain accredited to ISO 14001 standards and will continue to seek to reduce our impact on the environment.

The amount of waste produced over the past year is a result of our investment in new windows at Alice Holt. Wooden windows that were initially installed in 1959 were replaced with double-glazed wooden units. At the same time, aged flat roofs were renewed. Following the completion of these works the energy performance certificate (EPC) was reassessed in February 2017. Separate EPC assessments were carried out for the laboratory block and the lodge building, and both were assessed as Category C. The laboratory has an EPC rating of 60 and the lodge a rating of 57. The higher rating for the laboratory is caused by the fridges, freezers and air conditioner units held in this part of the building. The previous (2015) EPC rating for Alice Holt was 67; in 2008 it was 157. This significant improvement in EPC rating is attributed to comprehensive roof repairs, the installation of photovoltaic (PV) panels, the replacement and upgrading of windows and investments in new energy-efficient fridges. The PV generation at Alice Holt continues to provide benefits for our work, producing 24,987 kWh of electricity, bringing tariff payments (income) to FR of just over £9,000 and helping to offset CO₂ emissions.

Business sustainability remains a standing item on the Site Management Committees at Alice Holt and at our Northern Research Station, and is reported at the FR Executive Board. As noted in last year's report, we were delighted to have received investment funding from Defra for a replacement programme of windows and roofs at Alice Holt. This investment was received and delivered in full in 2016–17 and we acknowledge and express our thanks to Defra for their support. Thanks also to FR staff and to colleagues from the Forestry Commission, Natural England and the Environment Agency, who work from Alice Holt, for their flexibility and patience while the comprehensive – and at times noisy – works were carried out.

Future plans include the ongoing need to update our video conferencing facilities, which help reduce the amount of travel required and bring the benefits of reduced travel costs and carbon emissions, and assist work-life balance. We are purchasing newer, more energy-efficient equipment whenever replacements are needed, such as photocopiers that use less ink and consume less energy. We are investigating automatic meter readers for our gas, electricity and water, and – if resources are available – the installation of electric car charging points at our two main stations. We will continue to engage with staff and seek to reduce our use of natural resources wherever possible.

Performance measurement		2016-17		2015-16	2014-15	2013-14
Area		Actual (qty/cost)	Comment			
Greenhouse gas emissions (Scopes 1, 2 and 3 business travel including national and international air/rail travel) and energy used by built estate and tonnes CO ₂ e		£428,307 329	Figures for 2016-17 are regarded as a new baseline in order to consider FR's increased headcount	£441,245 459	£486,927 518	£451,644 447
Electricity, gas and other heating fuels (estate)#	Consumption (kWh)	2,578,429	FR generated 24,987 kWh from the photovoltaic panels at Alice Holt	2,676,905	2,429,460	2,659,800
	Expenditure and tonnes CO ₂ e	£180,543 765		£187,953 904	£178,078 820	£188,830 898
Total energy*	Expenditure	£608,850		£629,198	£664,624	£640,474
Estate and office waste ~	Amount (tonnes)	278	Recycled: 95%; incinerated: 1%; landfill 4%	1,345	200	204
	Expenditure	£33,567		£35,052	£21,140	£15,646
Estate and office water	Quantity used (m ³)	12,098		14,137	12,763	9,681
	Expenditure	£15,442		£18,180	£17,739	£11,475
Biodiversity action planning	Forest Research does not have biodiversity action plans. However, we do undertake, contribute to, and publish expert research and evidence on aspects of biodiversity that form a significant part of the policies, practices and biodiversity action plans across GB, Europe and occasionally, internationally.					
Sustainable procurement	Forest Research follows the procurement terms and procedures of the Forestry Commission as detailed in the respective Operational Guidance Booklets.					
		# 2016-17 figures take account of charges to tenants for utilities and the income and power generated by the photovoltaic panels at Alice Holt. * Total energy is the fossil fuel consumption of the built estate (heating and lighting, etc.) and the CO ₂ from travel. ~ Waste includes sewage (169 tonnes equivalent) and other waste (109 tonnes equivalent) and costs of £2,700 and £30,867, respectively.				



Accountability Report

Corporate Governance

The corporate governance report describes Forest Research's governance structures. It comprises the Directors' Report, the Statement of Accounting Officer's Responsibilities and the Governance Statement. This meets accountability requirements to Parliament as set out in Chapter 5 of Part 15 of the Companies Act 2006 and Schedule 7 of SI 2008 No 410 and amended by the *Government Financial Reporting Manual*.

Directors' Report

Relationship with Defra and the wider Defra network

The Department for Environment, Food and Rural Affairs (Defra) Ministers who had responsibility for the Forestry Commission, including Forest Research, during the year were:

Elizabeth Truss MP	<i>Secretary of State until 14 July 2016</i>
Andrea Leadsom MP	<i>Secretary of State from 14 July 2016</i>
George Eustice MP	<i>Minister of State</i>
Rory Stewart MP	<i>Parliamentary Under-Secretary of State until 14 July 2016</i>
Thérèse Coffey MP	<i>Parliamentary Under-Secretary of State from 14 July 2016</i>

Composition of the Management Board

Members of the Executive Board of Forest Research during the year were:

James Pendlebury *	<i>Chief Executive</i>
Peter Freer-Smith *	<i>Chief Scientist</i>
Mike Cowan	<i>Human Resources Business Partner until 12 April 2016</i>
Sarah England	<i>Head of Human Resources from 4 April 2016</i>
Helen McKay	<i>Head of Centre for Sustainable Forestry and Climate Change</i>
Chris Quine	<i>Head of Centre for Ecosystems, Society and Biosecurity</i>
Sandra Smith	<i>Head of Finance</i>
Peter Weston	<i>Head of Inventory, Forecasting and Operational Support from 1 April 2016</i>
Hugh Williams	<i>Head of Centre for Research Services</i>
Shireen Chambers	<i>Non-Executive Director</i>

The Chief Executive is appointed following public advertising of the post. The term of the appointment, and provision for its termination, are governed by the Civil Service Commission Recruitment Code.

Further details on remuneration are set out in the Remuneration Report.

* These Board Members have related party interests which are disclosed in Note 16.

Register of interests

A register of interests of all Board Members is maintained by Forest Research and published on our website, www.forestry.gov.uk/forestresearch

Personal-data-related incidents

There were no protected personal-data-related incidents reported for Forest Research in 2016–17.

Forest Research will continue to monitor and assess its information risks in order to identify and address any weaknesses and ensure continued improvement of its systems. Further information on the handling of information risk is contained in the Governance Statement.

Statement of Accounting Officer's responsibilities

Under Section 7 of the Government Resources and Accounts Act 2000, HM Treasury has directed Forest Research to prepare for each financial year a statement of account in the form and on the basis set out in the Accounts Direction. The accounts are prepared on an accruals basis and must give a true and fair view of the Forest Research state of affairs at the year-end and of its income and expenditure, changes in taxpayers' equity and cash flows for the financial year.

In preparing the accounts the Accounting Officer is required to comply with the requirements of the *Government Financial Reporting Manual* and in particular to:

- observe the Accounts Direction issued by HM Treasury, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- make judgements and estimates on a reasonable basis;
- state whether applicable accounting standards, as set out in the *Government Financial Reporting Manual*, have been followed, and disclose and explain any material departures in the accounts;
- prepare the accounts on the going-concern basis.

The Director FC England, in his role as Additional Accounting Officer for the Forestry Commission, has designated Forest Research's Chief Executive as the Agency's Accounting Officer. The Chief Executive's responsibilities as Forest Research Accounting Officer (including responsibility for the propriety and regularity of the public finances for which an Accounting Officer is answerable, for keeping proper records, and for safeguarding Forest Research's assets) are set out in *Managing Public Money* produced by HM Treasury.

As Accounting Officer, I confirm that as far as I am aware there is no relevant audit information of which our auditors are unaware. I have taken all necessary steps to make myself aware of all such information and to establish that our auditors are equally informed. I take personal responsibility for the Annual Report & Accounts and the judgments required for determining that they are fair, balanced and understandable, which I confirm they are.

Governance Statement

Introduction and scope of responsibility

As Agency Accounting Officer for Forest Research, I have responsibility for ensuring that its business is conducted in accordance with the law and proper standards, and that public money is safeguarded and properly accounted for, and used economically, efficiently and effectively in accordance with *Managing Public Money*. In discharging this overall responsibility, I am responsible for putting in place appropriate arrangements for the governance of its affairs, facilitating the effective exercise of its functions, which includes ensuring a sound system of control is maintained through the year and that arrangements are in place for the management of risk.

The purpose of the governance framework

The governance framework comprises the systems and processes, and culture and values, by which Forest Research is directed, controlled and led. It enables the Agency to monitor the achievement of its strategic objectives and to consider whether those objectives have led to the delivery of appropriate, cost-effective outcomes which are also compliant with the law and with policy.

The system of internal control is a significant part of that framework and is designed to manage risk to a reasonable level. It cannot eliminate all risk and can therefore only provide reasonable and not absolute

assurance of effectiveness. The system of internal control is based on an ongoing process designed to identify and prioritise the risks to the achievement of the Agency's policies, aims and objectives, to evaluate the likelihood of those risks being realised and the impact should they be realised, and to manage them efficiently, effectively and economically.

The governance framework has been in place at Forest Research throughout 2016–17 and up to the date of approval of the Annual Report and Accounts, and complies with HM Treasury guidance.

The governance framework

Forest Research is an Executive Agency of the Forestry Commission. The Agency's Framework Document sets out my responsibilities as Agency Accounting Officer. I am a member of the Forestry Commission's Executive Board and am responsible, normally through Director Central Services, to the Forestry Commissioners for the management of the Agency. I have a right of direct access to the Forestry Commissioners and to the relevant Minister, and a right to meet them at least once a year.

Forest Research Executive Board (FREB)

The FREB was established to manage the day-to-day operations and performance of the Agency, within the policy framework set by Ministers and the Forestry Commissioners. The Board meets regularly and met 11 times during 2016–17. The Board discussed a wide range of forest research and related issues, including:

- future science;
- Research Strategy Management Board;
- communications;
- Forestry Governance Project;
- Corporate Plan Key Actions;
- health and safety;
- business development, including external income;
- the integration of Inventory, Forecasting and Operational Support (IFOS) and other staff from the FC who transferred to Forest Research on 1 April 2016;
- risk management.

At each of the meetings during 2016–17 the Board also discussed the Finance and Human Resources reports and received verbal updates on Forestry Commission-wide Governance meetings. They also periodically reviewed Centre reports on Sustainable Forestry and Climate Change, Ecosystems, Society and Biosecurity, Research Services and Inventory, Forecasting and Operational Support. Further information about FREB, including membership and attendance, is available on our website, www.forestry.gov.uk/forestresearch

Audit and Risk Assurance Committee

FREB established an Audit and Risk Assurance Committee (ARAC), comprising three non-executive members, to support it in its responsibilities for the effective management of risk, control and governance. Forest Research has a risk register which is reviewed by the ARAC. Through its work, the ARAC provides independent assurance to the FREB on those key activities which support the achievement of the Agency's objectives. Assurance is also provided through the findings from work carried out by Internal Audit. The ARAC operates in accordance with the principles contained in HM Treasury's *Audit and Risk Assurance Committee Handbook*.

During the year the Committee discussed a wide range of issues including:

- risk management;
- Annual Report and Accounts 2015–16;
- Internal and External Audit strategies and reports;
- information security;

- Forestry Governance Project;
- Governance Statement;
- the Committee's structure and effectiveness.

There were three ARAC meetings in 2016–17 (May and November 2016, March 2017) with attendance as follows:

Name	No. of meetings
Mary Barkham <i>from November 2016</i>	1
Shireen Chambers	3
Judith Webb (Chair)	3

Review of effectiveness

As Agency Accounting Officer, I have responsibility for conducting, at least annually, a review of the effectiveness of the governance framework. My review is informed by the work of Internal Audit and the executive managers across Forest Research and the Forestry Commission who have responsibility for the development and maintenance of the governance and control framework, and by comments made by the external auditors in their management letter and other reports.

I receive an Annual Assurance Statement from the Director of Central Services for the Forestry Commission, based centrally in Edinburgh, providing me with assurance on the standard of governance and control within Central Services.

The Head of Internal Audit has prepared an annual report and assurance statement to me as Agency Accounting Officer. The report includes an overall assessment of the adequacy and effectiveness of risk management, control and governance within Forest Research. The overall opinion is that internal control within Forest Research continues to provide moderate assurance. Some improvements are required to enhance the adequacy and effectiveness of the framework of governance, risk management and control.

Forest Research applies the principles of HM Treasury's *Code of Good Practice* for corporate governance in the context of its own circumstances, where relevant and practical.

The Forest Research ARAC has been assessed as being in line with requirements for public sector bodies as per HM Treasury guidance and has carried out periodic self-assessment reviews.

A review of the effectiveness of FREB was carried out by Internal Audit during the year, reporting in March 2017. The review included seeking feedback from members on the structure and functioning of the Board and the responses received were positive. The findings were that FREB complies with the Code of Good Practice for Corporate Governance in Central Government departments. No formal recommendations were made but a number of suggestions for procedural improvements were proposed.

Work to date has not identified any significant control weaknesses and has supported findings from financial control visits and the other work of internal and external auditors.

Risk management

FREB recognises that risk must be managed, but management of risk is not the same as risk aversion, i.e. an unwillingness to accept any risk. Resources available for managing risk are finite so the aim is to achieve an optimum response to the risk. Forest Research evaluates the amount of risk that it is prepared to accept before taking action (risk appetite), using a risk-scoring matrix of likelihood and impact for inherent and residual risk. This is subject to ongoing management review. FREB ensures that the risk management policy is implemented and that it strategically reviews key risks. Each risk identified in the risk register has a corresponding Senior Risk Owner who is a Board-level officer with the authority to take effective action.

Forest Research has an ARAC to support the Accounting Officer and the Agency Executive Board in their responsibilities for the effective management of risk, control and governance (see section above).

Whistleblowing

Forest Research is committed to ensuring a high standard of conduct in all that it does and has a duty to identify and remedy any area of malpractice. This is achieved through encouraging a culture of openness, where employees feel confident to raise concerns about potential wrongdoing. This positive approach to whistleblowing is aligned to our organisation's values; for example, in our communications we are open, honest and objective with each other and our stakeholders.

Forestry Commission's Director Central Services has overall responsibility for whistleblowing policy and practice and works with the Chief Executive to ensure its effectiveness. Throughout the year cases were managed centrally by the Head of Internal Audit. In April 2017, Internal Audit was devolved to the countries. Mechanisms have been established through our policy whereby all cases for Forest Research are now managed through our nominated officer. All cases are investigated thoroughly, ensuring that any lessons learnt and recommendations are embedded into how we operate as an organisation. During October 2016, as part of the Civil Service Whistleblowing Awareness Week, we re-enforced the importance of whistleblowing through a communication which reminded staff what whistleblowing is, why it is important and what we should do if we think something is not right. The policy is reviewed regularly and was last updated in May 2015 to take account of the changes made by Civil Service Employee Policy (CSEP) to reflect the Public Accounts Committee (PAC) recommendations.

Ministerial direction

No ministerial directions were given during the year.

Significant governance and risk issues

Key governance and risk issues are:

Forestry Governance Project

The future of Forest Research has previously been under consideration by the Forestry Commission as a component of the Woodland Policy Enabling Programme. However, the UK Government and Scottish Ministers have agreed that officials will work jointly to consider options for the transfer of Forestry Commissioners' powers and duties as they relate to Scotland to Scottish Ministers. This work will be undertaken by a group comprising senior Defra, Scottish, Welsh and Forestry Commission officials called the Forestry Governance Project Board. As part of this work the Board will consider the future organisational options (given their role as both funders and customers of the Agency) for Forest Research. Forest Research is actively involved in this work. The purpose is to produce a strategic outline business case, focusing on the strategic and economic cases, for a future operating model for Forest Research in order to enable recommendations to be made to responsible Ministers on the future delivery of forestry research functions.

Information communication technology (ICT) infrastructure

The ICT infrastructure modernisation programme continues with further migration of key business applications to the new platform. The programme continues to make positive inroads into the business risk posed by ICT infrastructure failure. The disaster recovery facility at the Northern Research Station is operational and, subject to testing, has the capacity to restore major corporate systems within five working days. Forest Research is dependent on the Forestry Commission's ICT infrastructure and, while some risk to our business operations still remains as work continues, the overall risk position has substantially improved.

Business continuity management

Forest Research has business continuity plans to ensure that there are procedures in place to facilitate the recovery of business activities, although it is recognised that these still focus more on disaster recovery than on business continuity. We will review the plans again during 2017-18 to bring them more up to date.

Forest Research is reliant on Shared Services, based in Silvan House in Edinburgh, for many of its Human Resources, Information Services and Finance requirements, and the uncertainty generated by the expectation that these services will be devolved to countries and Forest Research has led to an increase in the loss of key

staff which, together with difficulties encountered in recruiting talent, has increased the risk of disruption to business continuity. The Forestry Commission has introduced additional controls and actions, including a review of recruitment and retention policy, to mitigate the risk.

Information risk management

Forest Research shares a common approach to information risk management with the Forestry Commission. The Forestry Commission continues to take a proportionate approach to information risk. Forest Research does not have as much sensitive information as most other departments and our information holdings are relatively small. We therefore manage risk as appropriate for the business.

Within that context, Forest Research fully considers, manages and cares for its information. Forest Research's Head of Research Services is the Senior Information Risk Owner for Forest Research and participates in the meetings of the Forestry Commission's Information Security Management Forum (ISMF).

The ISMF has agreed that Privacy Impact Assessments will be required for all projects that involve the handling of personal information. Three levels of 'Responsible for Information' training are now online and have been undertaken by all staff where required at the appropriate level for their role.

Progress continues to be made in the designation of local Information Asset Owners, identifying and recording local information assets, including personal information and improving the procedures for reporting losses. This work is continuing to help our understanding of the value of the information we hold and reinforce an improved information security culture across the organisation.

Modelling and quality assurance

A sensible and proportionate approach to quality assurance has been adopted across Forest Research in terms of business-critical models and the associated risks are being managed properly.

Wider circumstances and future challenges

The main challenges for Forest Research during 2017–18 and beyond are:

- managing the likelihood of organisational change to the Agency while maintaining business continuity;
- maintaining Agency relevance to an increasingly devolved governmental client base and changing evidence commissioning arrangements;
- responding to new and unforeseen tree health disease outbreaks or other issues;
- delivering the interdisciplinary science programmes for 2015–19;
- planning and responding to changes in the Agency's non-core income, including post-EU exit;
- completing plans for devolving central services and establishing new corporate service provision, while maintaining business continuity;
- enhancing our scientific capability and research offer through effective and strategic partnerships;
- growing our international profile, activities and business.

In 2017–18 Forest Research will remain focused on managing these challenges either directly, or in partnership with other bodies across the Defra network and wider government, while continuing to maintain business continuity across the broad range of its operations and meeting stakeholder expectations in line with the Corporate Plan.



Professor James Pendlebury
Chief Executive and Accounting Officer

6 July 2017

Remuneration and Staff Reports

Remuneration Report

Employment contracts

The Constitutional Reform and Governance Act 2010 requires Civil Service appointments to be made on merit on the basis of fair and open competition. The Recruitment Principles published by the Civil Service Commission specify the circumstances when appointments may be made otherwise. All senior staff covered in this report hold appointments which are open-ended until they decide to retire or leave. Professor James Pendlebury and Professor Peter Freer-Smith's notice period is 13 weeks, and for other senior staff it is three months. Early termination in situations of redundancy would result in the individual receiving compensation as set out in the Civil Service Compensation Scheme. Further information about the work of the Civil Service Commissioners can be found at <http://civilservicecommission.independent.gov.uk>

Remuneration policy

Remuneration of Forest Research Executive Board Members who hold senior staff group posts is determined by the Forestry Commission's Senior Pay Committee in accordance with guidelines prescribed by the Cabinet Office. Details of membership of the Pay Committee are provided in the Remuneration Report of Forestry Commission England/Central Services. Other Board Members' remuneration is determined by the standard processes set out in the Forestry Commission's pay and grading system.

Remuneration (salary, benefits in kind and pensions) – subject to audit

The following sections provide details of the remuneration and pension interests of the civil servants who are members of the Forest Research Executive Board.

Name	2016-17				2015-16			
	Salary £000	Benefits in kind (to the nearest £100)	Pension benefits £000	Total £000	Salary £000	Benefits in kind (to the nearest £100)	Pension benefits £000	Total £000
James Pendlebury	80-85	4,300	16	100-105	70-75	4,100	18	95-100
Peter Freer-Smith	75-80	-	15	90-95	70-75	3,100	24	100-105
Mike Cowan ~	0-5	-	1	0-5	25-30	-	21	45-50
Sarah England *	40-45	100	69	110-115	-	-	-	-
Helen McKay	65-70	-	10	75-80	65-70	-	15	80-85
Chris Quine	65-70	-	10	75-80	65-70	-	15	80-85
Sandra Smith	50-55	-	21	75-80	50-55	-	21	75-80
Peter Weston #	65-70	-	12	75-80	-	-	-	-
Hugh Williams	60-65	-	21	80-85	55-60	-	29	85-90

~ Mike Cowan left on 12 April 2016; he worked 60% for Forest Research and 40% for Forestry Commission. The table shows the whole of his pension benefits but only the FR share of his salary.

* Sarah England joined on 4 April 2016; she works 60% for Forest Research and 40% for Forestry Commission. The table shows the whole of her pension benefits but only the FR share of her salary.

Peter Weston joined Forest Research on 1 April 2016.

The value of pension benefits accrued during the year is calculated as (the real increase in pension multiplied by 20) plus (the real increase in any lump sum) less (the contributions made by the individual). The real increases exclude increases due to inflation or any increase or decrease due to a transfer of pension rights.

No bonuses were payable in either 2016–17 or 2015–16.

Salary

'Salary' includes gross salary, overtime and any allowances subject to UK taxation.

Benefits in kind

The monetary value of benefits in kind covers any benefits provided by the employer and treated by HM Revenue and Customs (HMRC) as taxable income. Benefits in kind are given in the form of the private use of a car and house purchase loans.

Fair pay disclosure – subject to audit

Reporting bodies are required to disclose the relationship between the remuneration of the highest-paid director in their organisation and the median remuneration of the organisation's workforce.

The banded remuneration of the highest-paid director of Forest Research in the financial year 2016–17 was £85,000 – £90,000 (2015–16: £75,000 – £80,000). This was 3.17 times (2015–16: 2.93) the median remuneration of the workforce, which was £27,614 (2015–16: £26,482). In 2016–17 no employees (2015–16: nil) received remuneration in excess of the highest-paid director.

Total remuneration includes salary and benefits in kind. It does not include severance payments, employer pension contributions and the Cash Equivalent Transfer Value of pensions.

Pension benefits 2016–17 – subject to audit

Name	Accrued pension at age 60 at 31/3/17 and related lump sum (LS) £000	Real increase in pension and related lump sum (LS) £000	CETV at 31 March 2017 £000	CETV at 31 March 2016* £000	Real increase in CETV £000
James Pendlebury	15–20 plus 45–50 LS	0–2.5 plus 2.5–5.0 LS	324	294	14
Peter Freer-Smith	30–35 plus 95–100 LS	0–2.5 plus 2.5–5.0 LS	721	707	15
Mike Cowan	5–10 plus nil LS	0–2.5 plus nil LS	81	81	0
Sarah England	25–30 plus 70–75 LS	2.5–5 plus 5–7.5 LS	469	403	44
Helen McKay	30–35 plus 95–100 LS	0–2.5 plus 0–2.5 LS	705	696	10
Chris Quine	25–30 plus 85–90 LS	0–2.5 plus 0–2.5 LS	647	610	10
Sandra Smith	10–15 plus nil LS	0–2.5 plus nil LS	186	162	15
Peter Weston	35–40 plus 50–55 LS	0–2.5 plus 0 LS	751	708	11
Hugh Williams	20–25 plus 10–15 LS	0–2.5 plus 0 LS	339	310	8

*The figure may be different from the closing balance in last year's accounts. This is due to the Cash Equivalent Transfer Value (CETV) factors being updated to comply with the Occupational Pension Scheme (Transfer Values) (Amendment) Regulations 2008.

Civil Service pensions

Pension benefits are provided through the Civil Service pension arrangements. From 1 April 2015 a new pension scheme for civil servants was introduced – the Civil Servants and Others Pension Scheme or **alpha**, which provides benefits on a career average basis with a normal pension age equal to the member's State Pension Age (or 65 if higher). From that date all newly appointed civil servants and the majority of those already in service joined **alpha**. Prior to that date, civil servants participated in the Principal Civil Service Pension Scheme (PCSPS). The PCSPS has four sections: three that provide benefits on a final salary basis (**classic**, **premium** or **classic plus**) with a normal pension age of 60; and one that provides benefits on a whole career basis (**nuvos**) with a normal pension age of 65.

These statutory arrangements are unfunded with the cost of benefits met by monies voted by Parliament each year. Pensions payable under **classic**, **premium**, **classic plus**, **nuvos** and **alpha** are increased annually in line with Pensions Increase legislation. Existing members of the PCSPS who were within 10 years of their normal pension age on 1 April 2012 remained in the PCSPS after 1 April 2015. Those who were between 10 years and 13 years and 5 months from their normal pension age on 1 April 2012 will switch into **alpha** sometime between 1 June 2015 and 1 February 2022. All members who switch to **alpha** have their PCSPS benefits 'banked', with those with earlier benefits in one of the final salary sections of the PCSPS having those benefits based on their final salary when they leave **alpha**. (The pension figures quoted for officials show pension earned in PCSPS or **alpha**, as appropriate. Where the official has benefits in both PCSPS and **alpha**, the figure quoted is the combined value of their benefits in the two schemes.) Members joining from October 2002 may opt for either the appropriate defined benefit arrangement or a 'money purchase' stakeholder pension with an employer contribution (**partnership** pension account).

Employee contributions are salary-related and range between 3% and 8.05% of pensionable earnings for members of **classic** (and members of **alpha** who were members of **classic** immediately before joining **alpha**) and between 4.6% and 8.05% for members of **premium**, **classic plus**, **nuvos** and all other members of **alpha**. Benefits in **classic** accrue at the rate of 1/80th of final pensionable earnings for each year of service. In addition, a lump sum equivalent to three years' initial pension is payable on retirement. For **premium**, benefits accrue at the rate of 1/60th of final pensionable earnings for each year of service. Unlike **classic**, there is no automatic lump sum. **Classic plus** is essentially a hybrid with benefits for service before 1 October 2002 calculated broadly as per **classic** and benefits for service from October 2002 worked out as in **premium**. In **nuvos** a member builds up a pension based on their pensionable earnings during the period of scheme membership. At the end of the scheme year (31 March) the member's earned pension account is credited with 2.3% of their pensionable earnings in that scheme year and the accrued pension is uprated in line with Pensions Increase legislation. Benefits in **alpha** build up in a similar way to **nuvos**, except that the accrual rate is 2.32%. In all cases members may opt to give up (commute) pension for a lump sum up to the limits set by the Finance Act 2004.

The **partnership** pension account is a stakeholder pension arrangement. The employer makes a basic contribution of between 8% and 14.75% (depending on the age of the member) into a stakeholder pension product chosen by the employee from a panel of providers. The employee does not have to contribute, but where they do make contributions the employer will match these up to a limit of 3% of pensionable salary (in addition to the employer's basic contribution). Employers also contribute a further 0.5% of pensionable salary to cover the cost of centrally-provided risk benefit cover (death in service and ill-health retirement).

The accrued pension quoted is the pension the member is entitled to receive when they reach pension age or immediately on ceasing to be an active member of the scheme if they are already at or over pension age. Pension age is 60 for members of **classic**, **premium** or **classic plus**, 65 for members of **nuvos**, and 65 or State Pension Age (whichever is higher) for members of **alpha**. (The pension figures quoted for Board Members show pension earned in PCSPS or **alpha**, as appropriate. Where the official has benefits in both the PCSPS and **alpha**, the figure quoted is the combined value of their benefits in the two schemes, but note that part of that pension may be payable from different ages.)

Further details about the Civil Service pension arrangements can be found at www.civilservicepensionscheme.org.uk

Cash Equivalent Transfer Values

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement to secure pension benefits in another pension scheme or arrangement when the member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies. The figures include the value of any pension benefit in another scheme or arrangement which the member has transferred to the Civil Service pension arrangements. They also include any additional pension benefit accrued to the member as a result of their buying additional pension benefits at their own cost. CETVs are worked out in accordance with The Occupational Pension Schemes (Transfer Values) (Amendment) Regulations 2008 and do not take account of any actual or potential reduction to benefits resulting from Lifetime Allowance Tax which may be due when pension benefits are taken.

Real increase in CETV

This reflects the increase in CETV effectively funded by the employer. It does not include the increase in accrued pension due to inflation, contributions paid by the employee (including the value of any benefits transferred from another pension scheme or arrangement) and uses common market-valuation factors for the start and end of the period.

Remuneration of non-executives (information subject to audit)

The non-executive members of the Audit and Risk Assurance Committee received the following remuneration for their services:

Name	2016-17 £000	2015-16 £000
Mary Barkham *	0	0
Shireen Chambers †	5	5
Victoria M. Edwards ~	0	0
David A. Evans #	0	0
Judith Webb	1	1

* Mary Barkham's appointment commenced November 2016.

† Shireen Chambers is also a member of the Forest Research Executive Board.

~ Victoria Edwards' appointment ceased February 2016.

David Evans' appointment ceased May 2015.

Staff Report

Number of Senior Civil Servants by band

Band	Number of Senior Civil Servants
1A	1
1	1

Average number of persons employed (full-time equivalents) – subject to audit

	2016-17	2015-16
Permanent staff – male (5 Executive Board Members)	122	98
Permanent staff – female (3 Executive Board Members)	76	56
Total permanent	198	154
Others – male	18	10
Others – female	11	14
Total others	29	24
Total staff	227	178

Staff costs – subject to audit

	2016-17		2015-16
	Permanent staff	Other staff	Total
	£000	£000	£000
			£000
Wages and salaries	7,043	588	7,631
Social security costs	756	57	813
Employer's superannuation costs	1,369	122	1,491
Agency staff costs	0	179	179
	9,168	946	10,114
			7,734

The Principal Civil Service Pension Scheme (PCSPS) is an unfunded multi-employer defined benefit pension scheme but the Forestry Commission is unable to identify its share of the underlying assets and liabilities. The scheme actuary valued the scheme as at 31 March 2012. Details can be found in the resource accounts of the Cabinet Office: Civil Superannuation (www.civilservice.gov.uk/pensions).

For 2016-17, employers' contributions of £1,538,254 were payable to the PCSPS (2015-16: £1,216,945) at one of four rates in the range 20.0% to 24.5% of pensionable pay, based on salary bands. The scheme actuary reviews employer contributions every four years following a full scheme valuation. The contribution rates reflect benefits accruing during 2016-17 to be paid to the member when they retire and not the benefits paid during this period to existing pensioners.

Employees can opt to open a partnership pension account, a stakeholder pension with an employer contribution. Employers' contributions of £9,920 (2015-16: £8,892) were paid to one or more of a panel of three appointed stakeholder pension providers. Employer contributions are age-related and range from 8% to 14.75%. Employers also match employee contributions up to 3% of pensionable pay. In addition, employer contributions of £399, 0.5% of

pensionable pay (2015–16: £399, 0.8%), were payable to the PCSPS to cover the cost of the future provision of lump sum benefits on death in service or ill-health retirement of these employees.

Contributions due to the partnership pension providers at the Statement of Financial Position date were £nil. Contributions prepaid at that date were £nil.

Sickness absence

The Forestry Commission has one common sick absence management policy which covers Forest Research and provides a consistent framework approach to management. The policy is underpinned by an externally provided occupational health service and employee support programme which is available 24 hours a day. The average number of working days lost to sickness absence in Forest Research in 2016–17 was 8.6 per employee (2015–16: 7.9), compared with the average of 9.6 (2015–16: 10.5) for the Forestry Commission.

Early departure costs

During 2016–17 one member of staff left under Compulsory or Voluntary Redundancy terms (2015–16: nil). They received compensation payments of less than £10,000.

People

Forest Research follows the Forestry Commission's employment policies and values. Our values determine how we behave in fulfilling our objectives. They are:

- **teamwork:** we work collaboratively with each other and our stakeholders, ensuring trees, woods and forests meet the needs of society;
- **professionalism:** we enjoy and take pride in our work, acting with integrity and political impartiality to achieve high standards of health and safety, quality, efficiency and sustainability;
- **respect:** we value each other and our stakeholders, recognising diverse perspectives and treating everyone with consideration;
- **communication:** we are open, honest and objective with each other and our stakeholders. We are prepared to challenge and be challenged;
- **learning:** we are always learning, developing the skills, knowledge and behaviours to support organisational success;
- **creativity:** we seek new ways of doing things, sharing ideas and embracing change.

The Forestry Commission's People Strategy sets out the strategic direction in relation to our people. We continue to be an organisation that is committed to high levels of employee engagement, motivation and achievement, that openly encourages participation and personal development and that values its staff.

Equality and diversity is valued highly within our organisation and we are committed to providing equality of opportunity for our staff. Selection for employment or promotion is on merit on the basis of fair and open competition.

Full details of our People Strategy, Equality and Diversity Strategy and Objectives are available on the Forestry Commission's website.

Parliamentary Accountability Disclosures

Financial review

Much of FR's work is funded by the FC with Corporate and Forestry Support acting as purchaser of research and other services in support of the ministerially endorsed Science and Innovation Strategy for Forestry in Great Britain and forestry policies of the UK, Scottish, Welsh and Northern Irish governments. The funding from Corporate and Forestry Support was decided as part of SR10. In addition, FC England, FC Scotland and Natural Resources Wales purchase research, data services and surveys specifically related to their respective forest estates. FR has also been increasingly successful in securing funding from other government departments, the European Commission, UK research councils, commercial organisations, private individuals and charities. Collaborative bids with other research providers and consortium funding have become increasingly important, placing emphasis on effective partnership working.

Losses and special payments – subject to audit

There were no losses or special payments during 2016–17 (2015–16: nil).

Fees and charges – subject to audit

FR's primary financial objective is to recover full economic costs of its operations from the sale of services to customers and it has complied with the principles of cost allocation and charging requirements set out in HM Treasury and Office of Public Sector Information guidance.

Remote contingent liabilities – subject to audit

In addition to contingent liabilities reported within the meaning of IAS 37, FR also reports liabilities for which the likelihood of a transfer of economic benefit in settlement is too remote to meet the definition of contingent liability. There are currently no remote contingent liabilities.

Long-term expenditure trends

	2016–17 *	2015–16	2014–15	2013–14	2012–13
	£000	£000	£000	£000	£000
Staff costs	10,114	7,734	7,747	7,684	7,677
Other management costs	3,235	2,527	2,389	2,963	2,631
Materials and services	3,602	2,418	2,707	2,605	2,390
Total expenditure	16,951	12,679	12,843	13,252	12,698

* 2016–17 figures include costs of the transfer of FC staff and associated work to FR on 1 April 2016.

Certificate and Report of the Comptroller and Auditor General to the House of Commons

I certify that I have audited the financial statements of Forest Research for the year ended 31 March 2017 under the Government Resources and Accounts Act 2000. The financial statements comprise: the Statements of Comprehensive Net Expenditure, Financial Position, Cash Flows, Changes in Taxpayers' Equity; and the related notes. These financial statements have been prepared under the accounting policies set out within them. I have also audited the information in the Remuneration and Staff Reports and Parliamentary Accountability Disclosures that are described in that report and disclosures as having been audited.

Respective responsibilities of the Accounting Officer and auditor

As explained more fully in the Statement of Accounting Officer's responsibilities, the Accounting Officer is responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view. My responsibility is to audit, certify and report on the financial statements in accordance with the Government Resources and Accounts Act 2000. I conducted my audit in accordance with International Standards on Auditing (UK and Ireland). Those standards require me and my staff to comply with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of the audit of the financial statements

An audit involves obtaining evidence about the amounts and disclosures in the financial statements sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of: whether the accounting policies are appropriate to Forest Research's circumstances and have been consistently applied and adequately disclosed; the reasonableness of significant accounting estimates made by Forest Research; and the overall presentation of the financial statements. In addition, I read all the financial and non-financial information in the Annual Report to identify material inconsistencies with the audited financial statements and to identify any information that is apparently materially incorrect based on, or materially inconsistent with, the knowledge acquired by me in the course of performing the audit. If I become aware of any apparent material misstatements or inconsistencies I consider the implications for my certificate.

I am required to obtain evidence sufficient to give reasonable assurance that the expenditure and income recorded in the financial statements have been applied to the purposes intended by Parliament and the financial transactions recorded in the financial statements conform to the authorities which govern them.

Opinion on regularity

In my opinion, in all material respects the expenditure and income recorded in the financial statements have been applied to the purposes intended by Parliament and the financial transactions recorded in the financial statements conform to the authorities which govern them.

Opinion on financial statements

In my opinion:

- the financial statements give a true and fair view of the state of Forest Research's affairs as at 31 March 2017 and of the net expenditure for the year then ended; and
- the financial statements have been properly prepared in accordance with the Government Resources and Accounts Act 2000 and HM Treasury directions issued thereunder.

Opinion on other matters

In my opinion:

- the part of the Remuneration and Staff Reports and Parliamentary Accountability Disclosures to be audited has been properly prepared in accordance with HM Treasury directions made under the Government Resources and Accounts Act 2000; and
- the information given in the Performance Report and Accountability Report for the financial year for which the financial statements are prepared is consistent with the financial statements.

Matters on which I report by exception

I have nothing to report in respect of the following matters which I report to you if, in my opinion:

- adequate accounting records have not been kept or returns adequate for my audit have not been received from branches not visited by my staff; or
- the financial statements and the part of the Remuneration and Staff Reports and Parliamentary Accountability Disclosures to be audited are not in agreement with the accounting records and returns; or
- I have not received all of the information and explanations I require for my audit; or
- the Governance Statement does not reflect compliance with HM Treasury's guidance.

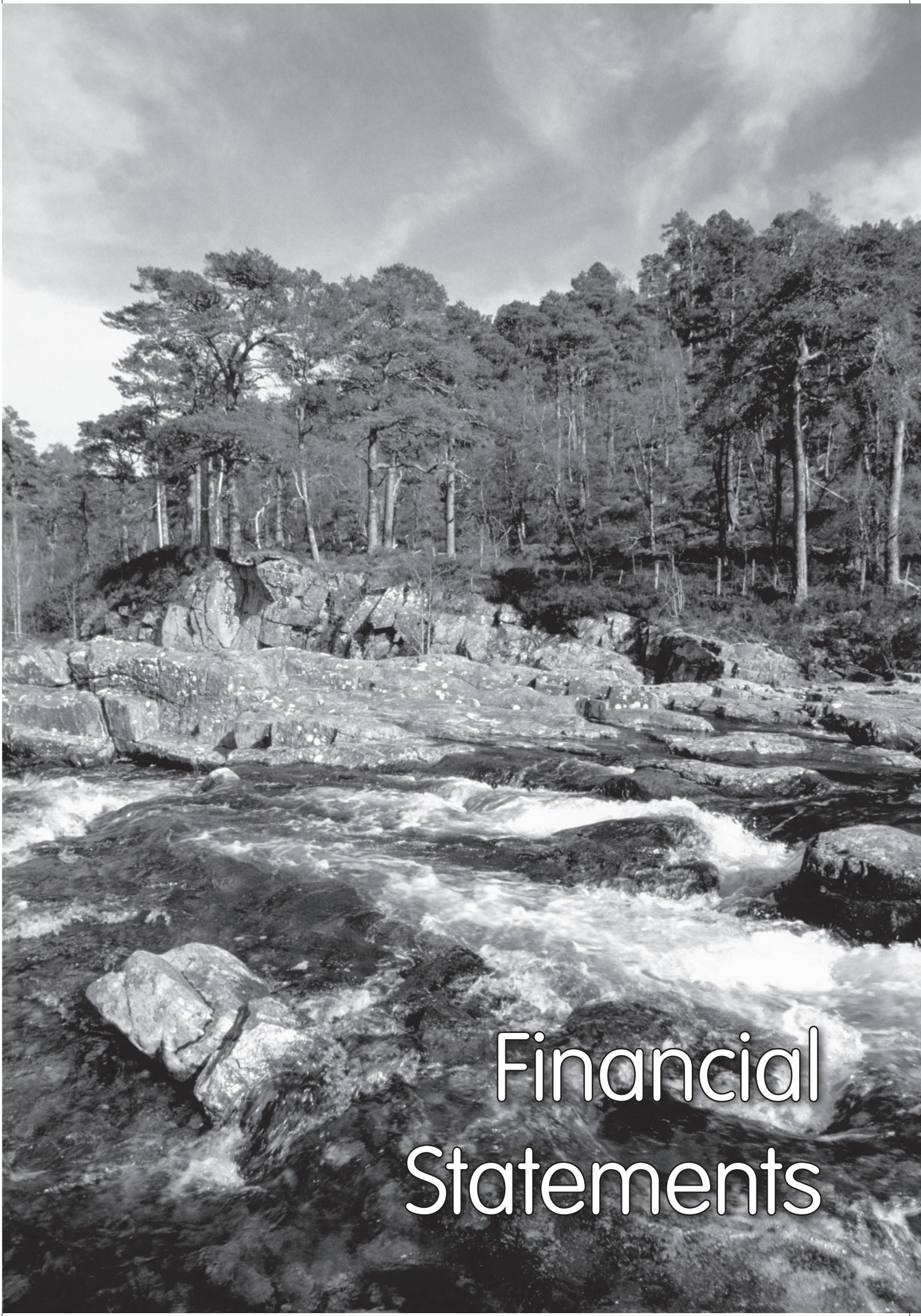
Report

I have no observations to make on these financial statements.

Sir Amyas C.E. Morse
Comptroller and Auditor General

National Audit Office
157–197 Buckingham Palace Road, Victoria, London SW1W 9SP

10 July 2017



Financial Statements

Statement of Comprehensive Net Expenditure for the year ended 31 March 2017

	Notes	2016-17 £000	2015-16 £000
Income			
Forestry Commission customers	6.1	(13,395)	(9,590)
Non-Forestry Commission customers			
European Union		(326)	(413)
Other	6.2	(2,771)	(2,594)
Total operating income		(16,492)	(12,597)
Expenditure			
Staff costs	3	10,114	7,734
Other management costs	4	3,235	2,527
Materials and services	5	3,602	2,418
Total operating expenditure		16,951	12,679
Net operating expenditure		459	82
Other comprehensive net (income)/expenditure			
Net loss/(gain) on revaluation of property, plant and equipment	7	230	(247)
Total comprehensive net (income)/expenditure for the year		689	(165)

All income and expenditure are derived from continuing operations.

The notes on pages 42 to 55 form part of these accounts.

Statement of Financial Position as at 31 March 2017

	Notes	31 March 2017 £000	31 March 2016 £000
Non-current assets			
Property, plant and equipment	7	11,254	10,450
Intangible assets		67	34
Financial assets		25	25
Total non-current assets		11,346	10,509
Current assets			
Inventories		133	-
Trade and other receivables	9	1,739	1,700
Cash and cash equivalents	10	1,108	268
Total current assets		2,980	1,968
Total assets		14,326	12,477
Current liabilities			
Provisions	12	(32)	(83)
Trade and other payables	11	(1,809)	(1,276)
Total liabilities		(1,841)	(1,359)
Total assets less current liabilities		12,485	11,118
Non-current liabilities			
Provisions	12	(36)	(53)
Total assets less total liabilities		12,449	11,065
Taxpayers' equity			
General Fund		5,430	3,660
Revaluation Reserve		7,019	7,405
Total equity		12,449	11,065



Professor James Pendlebury
Chief Executive and Accounting Officer
6 July 2017

The notes on pages 42 to 55 form part of these accounts.

Statement of Cash Flows for the year ended 31 March 2017

		2016-17	2015-16
	Notes	£000	£000
Net cash inflow from operating activities			
Net operating expenditure		(459)	(82)
Adjustments for non-cash transactions			
Depreciation	4	704	684
Amortisation	4	79	9
Loss on disposal of property, plant and equipment	4	-	19
Notional audit fee		35	35
Movements in provisions	12	13	333
(Increase)/decrease in inventories		(134)	2
(Increase) in trade and other receivables	9	(39)	(131)
Increase in trade and other payables	11	534	8
Movements in payables relating to investing activities		-	(25)
Use of provisions	12	(81)	(462)
Net cash inflow from operating activities		652	390
Cash flows from investing activities			
Purchase of property, plant and equipment	7	(1,895)	(258)
Purchase of intangible assets		(111)	-
Net cash (outflow) from investing activities		(2,006)	(258)
Cash flows from financing activities			
Net cash transfer from the Forestry Commission		2,194	-
Net financing		2,194	-
Net increase in cash and cash equivalents in the period		840	132
Cash and cash equivalents at the beginning of the period		268	136
Cash and cash equivalents at the end of the period		1,108	268

The notes on pages 42 to 55 form part of these accounts.

Statement of Changes in Taxpayers' Equity for the year ended 31 March 2017

	General Fund	Revaluation Reserve	Total Reserves
	£000	£000	£000
Balance at 1 April 2016	3,660	7,405	11,065
Changes in taxpayers' equity for 2016-17			
Net (loss) on revaluation of property, plant and equipment	-	(388)	(388)
Net gain on revaluation of intangible assets	-	2	2
Notional audit fee	35	-	35
Comprehensive net expenditure	(459)	-	(459)
Cash transferred from the Forestry Commission	2,194	-	2,194
Balance at 31 March 2017	5,430	7,019	12,449
Balance at 1 April 2015	3,701	7,162	10,863
Changes in taxpayers' equity for 2015-16			
Net gain on revaluation of property, plant and equipment	-	247	247
Net gain on revaluation of intangible assets	-	1	1
Realised element of the Revaluation Reserve	6	(5)	1
Notional audit fee	35	-	35
Comprehensive net expenditure	(82)	-	(82)
Balance at 31 March 2016	3,660	7,405	11,065

The notes on pages 42 to 55 form part of these accounts.

Notes to the Accounts

Note 1. Statement of accounting policies

These accounts are prepared in accordance with a direction given by HM Treasury in pursuance of Section 7 of the Government Resources and Accounts Act 2000.

These financial statements have been prepared on a going-concern basis and in accordance with International Financial Reporting Standards (IFRS) as adapted and interpreted by the 2016–17 *Government Financial Reporting Manual* (FReM) issued by HM Treasury. Where the FReM permits a choice of accounting policy, the accounting policy which is judged to be most appropriate to the particular circumstances of Forest Research for the purpose of giving a true and fair view has been selected. The particular policies selected by Forest Research are described below. They have been applied consistently in dealing with items considered material in relation to the accounts.

The preparation of financial statements in conformity with IFRS requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the accounting policies. There are no estimates, assumptions and judgements that are deemed to have a significant risk of causing a material adjustment to the carrying amounts of Forest Research's assets and liabilities.

1.1 Accounting convention

These accounts have been prepared under the historical cost convention modified to account for the revaluation of property, plant and equipment, and available-for-sale financial assets.

1.2 Value Added Tax (VAT)

Forest Research is covered under the Forestry Commission's registration for VAT. In order to comply with the government accounting regulations and normal commercial practice, income and expenditure shown in the Statement of Comprehensive Income is net of VAT. Irrecoverable VAT is charged to the Statement of Comprehensive Income in the year in which it is incurred.

1.3 Revenue recognition

Income comprises the fair value of the consideration received or receivable from forestry and related activities. Revenue is shown net of VAT, returns, rebates and discounts.

Forest Research recognises revenue when the amount of revenue can be reliably measured with reference to the Terms and Conditions of each contract and it is probable that future economic benefits will flow to it.

1.4 Foreign currency translation

Functional and presentation currency

Items included in the financial statements are measured using the currency of the primary economic environment in which Forest Research operates ('the functional currency'). The functional currency and the presentational currency of the financial statements is pounds sterling.

Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions or valuation where items are re-measured. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year-end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the Statement of Comprehensive Income.

1.5 Employee benefits

Pensions

Past and present employees are covered by the provisions of the Principal Civil Service Pension Scheme (PCSPS). PCSPS is an unfunded, defined benefit, contributory, public service occupation pension scheme. Forest Research accounts for the PCSPS as a defined contribution plan and recognises the expected cost of these elements on a systematic and rational basis over the period during which it benefits from an employee's services by payment to the PCSPS of amounts calculated on an accruing basis. Liability for payment of future benefits is a charge on the PCSPS. In respect of the defined contribution schemes, Forest Research recognises the contributions payable for the year. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in the future payments is available.

Short-term employee benefits

Liabilities and expenses are recognised for holiday entitlements earned to 31 March but not yet taken.

1.6 Property, plant and equipment

Where Forest Research is the principal beneficial user of assets of the Forestry Commission estate, they are treated as a non-current asset of Forest Research although legal ownership is vested in the Forestry Ministers.

The normal threshold for the capitalisation of assets is £2,000.

Dwellings and other buildings

Dwellings and other buildings are shown at fair value less accumulated depreciation.

Professionally qualified staff employed by the Forestry Commission undertake a full revaluation of dwellings and other buildings at five-yearly intervals coinciding with that for the non-forest land. They follow the principles set out in the RICS Red Book and value on the basis of Depreciated Replacement Cost for determining fair value. Suitably qualified external valuers review the work of internal professional valuers. A full valuation took place on 31 March 2013 and Smiths Gore (now trading under Savills), Chartered Surveyors, reviewed this.

Property is revalued annually as at 31 March using indices provided by Savills.

Subsequent expenditure

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to Forest Research and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognised. All other repairs and maintenance are charged to the Statement of Comprehensive Income during the financial period in which they are incurred.

Plant and machinery

Forestry vehicles, machinery and equipment are shown at fair value less accumulated depreciation. Plant and machinery values are restated to current value each year using indices provided by the Office for National Statistics.

Assets under construction

Assets under construction are carried at the costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Assets under construction are transferred to the appropriate property, plant and equipment category when completed and ready for use.

Revaluation reserve

Increases in the carrying amount arising on revaluation of property, plant, equipment and intangible assets are credited to the revaluation reserve in taxpayers' equity. Decreases that offset previous increases of the same asset are charged against the revaluation reserve directly; all other decreases are charged to the Statement of Comprehensive Income. Each year the difference between depreciation based on the revalued carrying amount

of the asset charged to the Statement of Comprehensive Income and depreciation based on the asset's original cost is transferred from the revaluation reserve to the general fund.

1.7 Depreciation

Depreciation is provided on all tangible non-current assets (except land) at rates calculated to write off the valuation, less estimated residual values, of each asset evenly over its expected useful life. Asset lives are as follows:

- freehold buildings: up to 80 years;
- scientific equipment: over 5 to 20 years;
- other machinery and equipment: over 5 to 20 years.

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at each reporting date. An asset's carrying amount is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount. Gains and losses on disposals are determined by comparing the proceeds with the carrying amount and are recognised within the Statement of Comprehensive Income. When revalued assets are sold, the amounts included in the revaluation reserve are transferred to the general fund.

1.8 Intangible assets

Intangible assets are valued initially at cost and subsequently at fair value using the revaluation model.

Where an active market does not exist, income-generating assets are valued at the lower of depreciated replacement cost and value in use. Non-income-generating assets are carried at depreciated replacement cost. These valuation methods are considered to be a proxy for fair value.

Computer software

Acquired computer software licences are initially capitalised on the basis of the costs incurred to acquire and bring to use the specific software and subsequently revalued to depreciated replacement cost. Acquired computer software licences are amortised over the life of their licence.

1.9 Impairment of non-financial assets

Assets subject to depreciation and amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. Where an asset is not held for the purpose of generating cash flows, value in use is assumed to equal the cost of replacing the service potential provided by the asset, unless there has been a reduction in service potential. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units). Non-financial assets that suffer impairment are reviewed for possible reversal of the impairment at each reporting date.

1.10 Financial assets

Classification

Forest Research classifies its financial assets in the following categories: at fair value through profit or loss, loans and receivables, and available-for-sale financial assets. The classification depends on the purpose for which the financial assets were acquired. Management determines the classification of its financial assets at initial recognition.

Recognition and measurement

Financial assets are recognised when Forest Research becomes party to the contractual provisions of the financial instrument and derecognised when the rights to receive cash flows from the asset have expired or have been transferred and Forest Research has transferred substantially all risks and rewards of ownership.

(a) Financial assets at fair value through profit or loss

Financial assets carried at fair value through profit or loss are initially recognised at fair value. Any subsequent gains or losses arising from changes in the fair value are presented in the Statement of Comprehensive Income.

(b) Loans and receivables

Loans and receivables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method, less provision for impairment. A provision for impairment of loans and receivables is established when there is objective evidence that Forest Research will not be able to collect all amounts due. Any impairment is recognised in the Statement of Comprehensive Income.

(c) Available-for-sale financial assets

Available-for-sale financial assets are initially recognised and subsequently carried at fair value.

1.11 Financial liabilities

Classification

Forest Research classifies its financial liabilities in the following categories: at fair value through profit or loss, and other financial liabilities. The classification depends on the purpose for which the financial liabilities were issued. Management determines the classification of its financial liabilities at initial recognition.

Recognition and measurement

Financial liabilities are recognised when Forest Research becomes party to the contractual provisions of the financial instrument. A financial liability is removed from the Statement of Financial Position when the obligation is discharged, cancelled or expired.

(a) Financial liabilities at fair value through profit or loss

Financial liabilities carried at fair value through profit or loss are initially recognised at fair value. Any subsequent changes in the fair value are presented in the Statement of Comprehensive Income.

(b) Other financial liabilities

Other financial liabilities are initially recognised at fair value and subsequently measured at amortised cost using the effective interest method.

1.12 Cash and cash equivalents

Cash and cash equivalents includes cash in hand, deposits held at call with banks, cash balances held by the Government Banking Service and other short-term highly liquid investments with original maturities of three months or less, and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities on the Statement of Financial Position.

1.13 Provisions

Forest Research provides for present legal and constructive obligations which are of uncertain timing or amount at the reporting date on the basis of the best estimate of the expenditure required to settle the obligation. Where the effect of the time value of money is significant, the estimated risk-adjusted cash flows are discounted using the real rate set by HM Treasury. The increase in the provision due to passage of time is recognised in the Statement of Comprehensive Income.

1.14 Contingent liabilities

Where the time value of money is material, contingent liabilities which are required to be disclosed under IAS 37 are stated at discounted amounts.

1.15 Effective in these financial statements

All International Financial Reporting Standards, Interpretations and Amendments effective at 31 March 2017 have been adopted in these statements, taking account of the specific interpretations and adaptations included within the FReM.

1.16 Effective for future financial years

IAS 8, Accounting Policies, Changes in Accounting Estimates and Errors, requires disclosures in respect of new International Financial Reporting Standards, Interpretations and Amendments that are, or will be applicable after the reporting period. There are a number of Standards, Amendments and Interpretations that have been issued by the International Accounting Standards Board that are effective for future reporting periods. Those with relevance to Forest Research are outlined below. None have been adopted early.

- IFRS 15 – Revenue from Contracts with Customers. This is effective from 1 January 2018. This standard replaces all existing IFRS guidance on revenue recognition.
- IFRS 9 – Financial Instruments. This is effective from 1 January 2018. This standard brings together all three phases of the financial instruments project: Classification and Measurement, Impairment and Hedge Accounting.
- IFRS 16 – Leases. This standard is effective from 1 January 2019. It will supersede all existing IFRS on leases. It is likely to result in a uniform accounting treatment for all leases, with the distinction between operating and finance leases removed.

Forest Research will apply the standards upon formal adoption in the FReM.

It is not anticipated that material adjustments to the financial statements will be required following the introduction of these standards.

Note 2. Segmental reporting

Forest Research's aim is to support and enhance the role of trees, woodlands and forests in sustainable development, by providing high-quality research, development and knowledge transfer. Management has determined that Forest Research operates as one operating segment, with results reviewed by the Chief Executive, as the chief operating decision-maker for Forest Research as a whole.

Note 3. Staff costs

	2016-17	2015-16
	£000	£000
Wages and salaries	7,631	6,026
Social security costs	813	480
Employer's superannuation costs	1,491	1,228
Agency staff costs	179	0
Total	10,114	7,734

More details on staff costs can be found in the Remuneration and Staff Reports.

Note 4. Other management costs

		2016-17	2015-16
	Notes	£000	£000
Travel and subsistence		519	514
Building maintenance		653	655
Utilities*		198	246
Training		98	83
Other expenditure		198	197
Computer supplies ~		730	40
Staff transfer expenses		8	28
Non-cash costs:			
Provisions – early departure costs:			
Provided in year	12	12	20
Unwinding of discount	12	1	–
Provisions – HMRC and other	12	–	(3)
Depreciation of property, plant and equipment	7	704	684
Amortisation of intangible assets		79	9
Loss on disposal of property, plant and equipment	7	–	19
Auditors' remuneration – notional cost		35	35
Total		3,235	2,527

* The photovoltaic panels at Alice Holt generated 24,987 kWh (2015-16: 25,548 kWh) of electricity.

~ IFOS incurred £690,000 computer costs, the majority related to its operational support services; specifically development, maintenance and support of 'Forester GIS'. This system is used, by more than 1,000 FC staff, to create, store, maintain and view inventory, planning and site management data for the public forest estate in England and Scotland.

Included within other management costs are charges from the Forestry Commission amounting in total to £90,000 (2015-16: £64,000).

Note 5. Materials and services

		2016-17	2015-16
		£000	£000
Materials and supplies		821	698
Central services provided by the Forestry Commission*		1,133	716
Vehicle lease charges from the Forestry Commission*		266	290
Contractors ~		543	447
Commissioned research		156	106
Publications		28	2
Protective clothing		10	11
Miscellaneous expenditure #		645	148
Total		3,602	2,418

* Charges are made to Forest Research from the Forestry Commission as appropriate, for assistance with field experiments, hire of vehicles, machinery and equipment and for personnel, business management, financial and other support services. The total charge from the Forestry Commission was £1,399,000 (2015-16: £1,007,000).

~ The level of spend on contractors is partially determined by the nature of the research work that Forest Research undertakes.

IFOS incurred £431,000 miscellaneous expenditure, 95% of which related to costs of field survey contractors collecting detailed inventory data on 1,930 one-hectare samples of forests in Britain as part of the National Forest Inventory.

Note 6. Income

6.1 Income from the Forestry Commission

Forest Research undertakes the major proportion of the Forestry Commission's overall annual research programme in the form of specifically commissioned projects to deliver agreed outputs, which is funded via CFS. A separate annual charge is agreed for each project based on full cost recovery. In addition, from 1 April 2016, CFS paid FR for services provided by IFOS and for those FC staff that transferred to FR. The 2016-17 charges to CFS for FR services amounted to £9,088,000. In addition to the annual research programme, Forest Research provides other research and survey services for the Forestry Commission, the majority of which is on a full cost-recovery basis.

Income from Forestry Commission customers consisted of:

	2016-17	2015-16
	£000	£000
Research, development and other services to:		
Corporate and Forestry Support	9,088	7,556
Inventory, Forecasting and Operational Support	-	142
England	1,825	765
Scotland	2,482	1,127
	13,395	9,590

6.2 Other income

Other income consisted of:

	2016-17	2015-16
	£000	£000
Contracts for research and services	2,592	2,366
Consultancy	-	5
Ad hoc – sample analysis, supply of seeds, conferences, advisory, reimbursement of expenses	179	223
	2,771	2,594

Note 7. Tangible non-current assets

	Freehold land	Buildings	Scientific equipment	Other machinery and equipment	Assets under construction	Total
	£000	£000	£000	£000	£000	£000
Valuation:						
At 1 April 2016	1,960	14,453	2,341	1,104	5	19,863
Additions	-	-	406	61	1,428	1,895
Transfers	-	1,433	-	-	(1,433)	-
Revaluation to current prices	51	(545)	157	28	-	(309)
At 31 March 2017	2,011	15,341	2,904	1,193	-	21,449
Depreciation:						
At 1 April 2016	-	7,378	1,420	615	-	9,413
Provided in year	-	405	215	83	-	703
Revaluation to current prices	-	-	65	14	-	79
At 31 March 2017	-	7,783	1,700	712	-	10,195
Carrying value:						
At 31 March 2017	2,011	7,558	1,204	481	-	11,254
At 31 March 2016	1,960	7,075	921	489	5	10,450
Valuation:						
At 1 April 2015	1,934	13,910	2,202	1,130	-	19,176
Additions	-	-	49	5	229	283
Transfers	-	224	-	-	(224)	-
Disposals	-	(17)	(22)	(39)	-	(78)
Revaluation to current prices	26	336	112	8	-	482
At 31 March 2016	1,960	14,453	2,341	1,104	5	19,863
Depreciation:						
At 1 April 2015	-	6,824	1,168	562	-	8,554
Provided in year	-	395	208	81	-	684
Disposals	-	(15)	(13)	(32)	-	(60)
Revaluation to current prices	-	174	57	4	-	235
At 31 March 2016	-	7,378	1,420	615	-	9,413
Carrying value:						
At 31 March 2016	1,960	7,075	921	489	5	10,450
At 31 March 2015	1,934	7,086	1,034	568	-	10,622

Fixed assets were revalued as at 31 March 2017 in accordance with accounting policies. The valuation includes the principal research stations at Alice Holt Lodge near Farnham in Surrey and the Northern Research Station, Roslin, near Edinburgh, with net book values (excluding land) of £5.0 million and £2.3 million, respectively, at 31 March 2017.

Note 8. Financial instruments

8.1 Financial Instruments by category

All financial assets on the Statement of Financial Position are loans and receivables, except for £25,000 (31 March 2016: £25,000) which is classified as available for sale and £87,000 prepayments (31 March 2016: £55,000). The available-for-sale asset is Forest Research's share of C-Cure Solutions Ltd.

All financial liabilities on the Statement of Financial Position are classified as other financial liabilities, except for £68,000 (31 March 2016: £151,000) taxation and social security costs and £118,000 (31 March 2016: £135,000) deferred income.

8.2 Exposure to risk

Credit risk

Forest Research is exposed to credit risk to the extent of non-payment by its counterparties in respect of financial assets receivable. The majority of assets relate to services provided to other public sector bodies and the risk of non-payment is considered low.

Liquidity risk

As the cash requirements of Forest Research are met primarily through funding from the Forestry Commission and devolved forestry bodies, it is not exposed to significant liquidity risks.

Interest rate risk

Forest Research has no significant interest-bearing assets or liabilities and as such income and expenditure cash flows are substantially independent of changes in market interest rates.

Foreign currency risk

Forest Research's only exposures to foreign exchange rates are through a bank account denominated in Euros and through receipt of funding for contracts which are denominated in Euros or New Zealand Dollars.

Contracts denominated in Euros and New Zealand Dollars forms only 2% of Forest Research's total income. Therefore, fluctuations in exchange rates do not have a significant impact on Forest Research.

Note 9. Receivables

	2016-17	2015-16
	£000	£000
Current		
EU trade receivables	336	215
Other trade receivables	732	666
Total trade receivables	1,068	881
Other receivables	8	13
House purchase loans to employees	15	17
Prepayments and accrued income	648	789
Total current receivables	1,739	1,700

The carrying amounts of trade and other receivables are a reasonable approximation of their fair value.

As of 31 March 2017, £501,000 (2015-16: £563,000) were fully performing and not overdue or impaired and provided for.

As of 31 March 2017, trade receivables of £567,000 (2015-16: £318,000) were overdue; this total has been reduced by £37,000 for a potential bad debt. The balance relates to a number of customers for whom there is no recent history of default. The age analysis of these trade receivables is as follows:

	2016-17	2015-16
	£000	£000
Months overdue		
Less than one month	42	35
One to two months	25	1
Two to three months	342	139
More than three months	158	143
	567	318

The other classes within trade and other receivables do not contain impaired assets.

The maximum exposure to credit risk at the reporting date is the carrying value of each class of receivable mentioned above. Forest Research does not hold any collateral as security.

The carrying amounts of trade and other receivables are denominated in the following currencies:

	2016-17	2015-16
	£000	£000
Current		
Pounds sterling	1,034	1,072
Euros	703	627
New Zealand Dollars	2	1
Total	1,739	1,700

Note 10. Cash and cash equivalents

The following balances at 31 March are held at Government Banking Service banks and as cash in hand:

	2016-17	2015-16
	£000	£000
Opening balance at 1 April	268	136
Net change in balances	840	132
Balance at 31 March	1,108	268

Forest Research had neither bank overdraft nor short-term investments as at 31 March for either of the two years.

Forest Research maintains Euro bank accounts for sums held on behalf of partners in European Commission projects which are treated as third-party assets and not included in the balances shown.

Note 11. Trade and other payables

	2016-17	2015-16
	£000	£000
Current		
Payments received on account	793	410
Trade payables	293	167
Taxation and social security costs	68	151
Other payables	33	15
Accrued expenses and deferred income	622	533
Total	1,809	1,276

The carrying amounts of trade and other payables are a reasonable approximation of their fair value.

All payables are to bodies external to central government and local authorities as at 31 March 2017 and 31 March 2016, with the exception of taxation and social security costs and £121,000 due to central government bodies as at 31 March 2016. Funds held on behalf of partners in European Commission projects are treated as third-party assets (see Note 17). At 31 March 2017 the amount held in Forest Research bank accounts on behalf of partners was £625,000 (31 March 2016: £182,000).

The carrying amounts of trade and other payables are denominated in the following currencies:

	2016-17	2015-16
	£000	£000
Current		
Pounds sterling	1,333	966
Euros	476	310
	1,809	1,276

Note 12. Provisions for liabilities and charges

	2016-17		2015-16	
	Other	Early departure costs	Other	Early departure costs
	£000	£000	£000	£000
Balance brought forward at 1 April	45	91	77	188
Provided in year	-	12	316	2
Provision not required written back	-	-	(3)	-
Utilised in year	(40)	(41)	(345)	(117)
Unwinding of discount	-	1	-	18
Balance carried forward at 31 March	5	63	45	91

Analysis of expected timing of discounted cash flows:

	Other	Early departure costs
	£000	£000
Less than one year	5	27
Later than one year but not later than five years	-	36
Balance at 31 March 2017	5	63

Forest Research meets the additional costs of benefits beyond the normal PCSPS benefits in respect of employees who retire by paying the required amounts annually to the PCSPS over the period between early departure and normal retirement date. Forest Research provides for this in full when the early retirement programme becomes binding on Forest Research by establishing a provision for the estimated payments.

The discount rate used to calculate unwinding costs and future costs is 0.24%.

Note 13. Capital commitments

There were nil contracted capital commitments as at 31 March 2017 (2015-16: £4,000).

Note 14. Commitments and receivables under operating leases

Total future minimum lease payments under operating leases are given in the tables below for each of the following periods. There are no lease payments due in more than five years.

Obligations under operating leases comprise:

	2016-17	2015-16
	£000	£000
Land and buildings:		
Not later than one year	7	7
Later than one year and not later than five years	14	21
Total	21	28

Total minimum lease payments under operating leases for land due to Forest Research are:

	2016-17	2015-16
	£000	£000
Not later than one year	5	5
Later than one year and not later than five years	20	20
Later than five years	78	83
Total	103	108

During 2012-13 the Environment Agency had a building constructed at Alice Holt and under the Memorandum of Terms of Occupancy has an obligation to pay Forest Research an annual capital allowance for occupation of the land for the 25-year term.

Note 15. Other financial commitments

There were no other financial commitments at 31 March 2017 (31 March 2016: £nil).

Note 16. Related party transactions

During the year, Forest Research has had a significant number of material transactions with the Forestry Commission, Forest Enterprise country agencies and Defra, who are regarded as related parties. In addition, Forest Research has had operational transactions with other government departments and other central government bodies.

16.1 Transactions with the University of Southampton

	2016-17	2015-16
	£000	£000
The University of Southampton	23	8

The above transactions, for course fees, student stipends, samples and a collaboration agreement, occurred on an arm's-length basis. These transactions are disclosed as Peter Freer-Smith holds a visiting professorship at the University of Southampton. There was an outstanding balance of £3,564 at 31 March 2017 (31 March 2016: £4,749).

16.2 Transactions with C-Cure Solutions Ltd

	2016-17	2015-16
	£000	£000
C-Cure Solutions Ltd	21	13

The above relates to charges to C-Cure in respect of accommodation used at Alice Holt and water sample analysis undertaken in the Forest Research laboratories. There was nil outstanding balance at 31 March 2017 (31 March 2016: £3,473). This is disclosed as, under the Agreement to form the company, James Pendlebury was appointed as the Forest Research Director of the company.

16.3 Transactions with the University of Stirling

	2016-17
	£000
The University of Stirling	19

The above transactions, for course fees, student stipend and a collaboration agreement, occurred on an arm's-length basis. These transactions are disclosed as Chris Quine holds a visiting professorship at the University of Stirling.

There was a nil balance outstanding at March 2017.

Note 17. Third-party assets

As a coordinator for a number of projects partially funded by the European Commission in Euros, Forest Research receives funds on behalf of partners for onward transmission once work programmes have been approved. These third-party assets are not recognised in the accounts.

	2015-16	Gross inflows	Gross outflows	2016-17
	£000	£000	£000	£000
Monetary third-party assets – Government	182	445	(2)	625
Banking Service balances				

Note 18. Events after the reporting date

There have been no events after the reporting date requiring an adjustment to the accounts.

In accordance with the requirements of IAS 10, events after 31 March 2017 are considered up to the date on which the accounts are authorised for issue by the Accounting Officer. This is interpreted as the date of the Comptroller and Auditor General's Audit Certificate.

