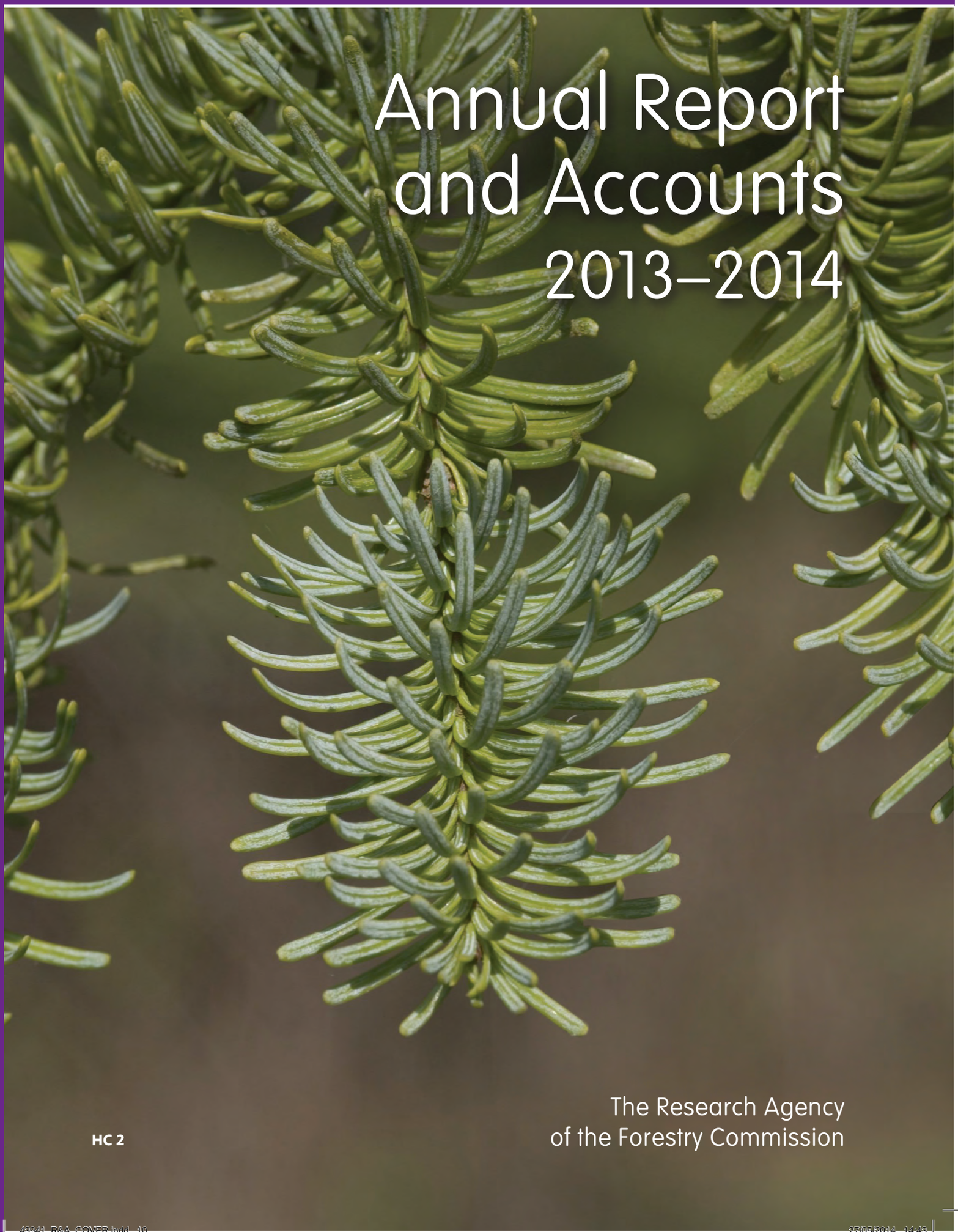
Forest Research



Annual Report and Accounts 2013–2014

The Research Agency of the Forestry Commission

HC 2

Forest Research Annual Report and Accounts 2013–2014

Forest Research
Annual Report and Accounts 2013–2014

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Cover: Noble fir (*Abies procera*) foliage. This is one of a number of silver firs that we have identified as a potentially useful species (see page 13).

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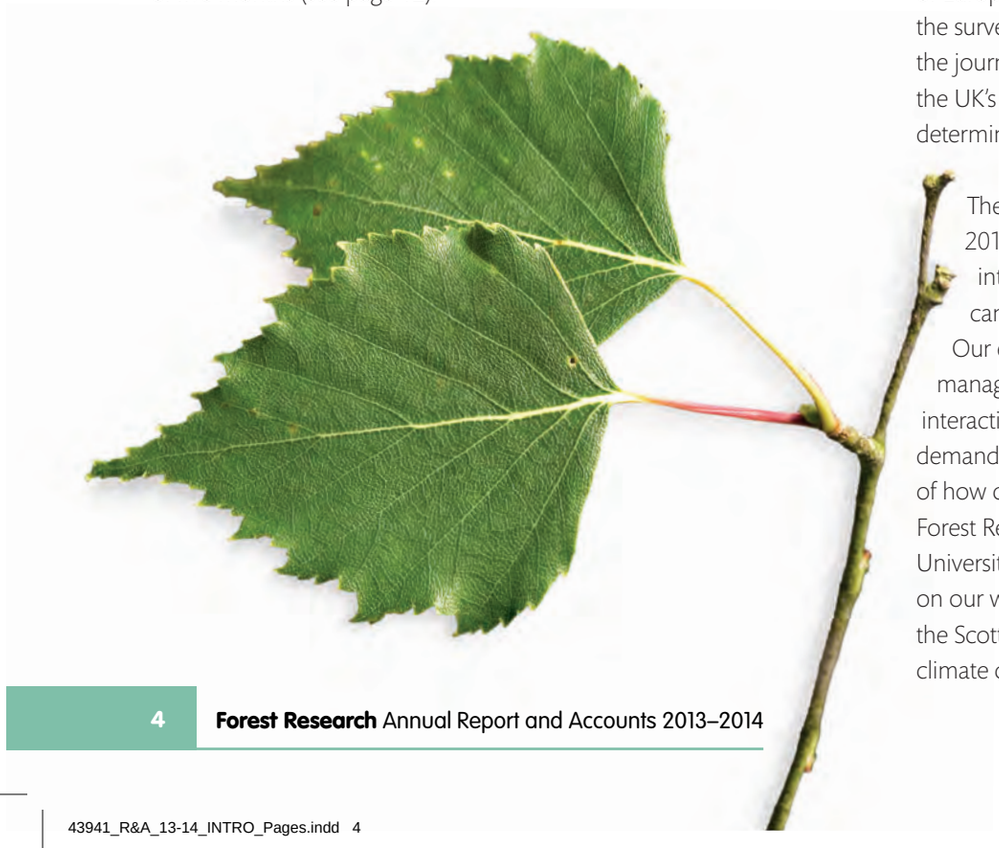
Chief Executive's Introduction

The past year has been a challenging one for our forests, as reflected in our increasing work on pests and diseases. While many challenges remain, we are also finding positive opportunities for developing our woodlands' contribution to overall resilience to climate change.

Forest Research and our many partners have continued to provide evidence and management information on a range of pests and diseases affecting the UK's forests. These include: ash dieback (*Chalara fraxinea*), *Phytophthora ramorum*, *Phytophthora austrocedrae*, acute and chronic oak decline, pine lappet moth (*Dendrolimus pini*), *Hylobius abietis* and Dothistroma needle blight. Forest Research staff support a number of outbreak management teams, for example on Chalara, Phytophthora and Dothistroma. We have also assisted staff of the Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture (USDA) in putting together a pest data sheet for *P. austrocedrae*.

Forest Research has delivered on its Corporate Plan targets for 2013–14 (see page 6). Perhaps one of the most impressive efforts of the year was the rapid delivery and establishment of a mass screening trial to identify Chalara resistance in ash trees. With fantastic support from a range of private, non-governmental organisation (NGO) and local-authority landowners, excellent contractors and help from the nursery sector, we fenced and planted 14 trial sites totalling 50 hectares in East Anglia, Kent and East Sussex with 155,000 disease-free ash saplings – all in the space of five months (see page 12).



It is also pleasing that the sector has made some progress in dealing with oak processionary moth (*Thaumetopoea processionea*). Forest Research continues to contribute by assisting with the monitoring of aerial spraying trials in Berkshire and pheromone trapping in the Royal Parks in London. In addition, we supported a trial led by Forestry Commission (FC) Scotland investigating the potential for aerial application of a copper fungicide to treat pines against Dothistroma needle blight (see page 14).

Further afield, some of our staff travelled to Moscow and the surrounding region in Russia, to study damage caused by the emerald ash borer (*Agrilus planipennis*). This was an EU Short-Term Scientific Mission within the PERMIT (Pathway evaluation and pest risk management in transport) programme. Working alongside Russian colleagues, we found that the beetle has now spread into the natural range of European ash (*Fraxinus excelsior*). Full details of the survey and its findings have been published in the journal *Forestry*. This is a good example of how the UK's approach to risk assessment can work in determining enhanced incipient risks.

The heavy rain, storms and flooding in late 2013 and early 2014 have led to increased interest in our work on how woodland can reduce the impacts of flood events. Our expertise in river systems, catchment management, forest hydrology, modelling and interactive mapping systems has also been much in demand. As part of an initiative to widen awareness of how climate change might affect Scotland's forests, Forest Research, FC Scotland and Heriot-Watt University produced a series of short films – available on our website – funded through ClimateXChange, the Scottish Government's centre of expertise on climate change.

Collaborative working remains a key strength for Forest Research and once again we have continued to build our networks and partnerships to attract external income. This year we generated £4.8 million of non-core income from a range of sources. One example of our partnership working is our leadership in securing LIFE+ funding for the ObservaTREE initiative. This four-year project, supported by the Department for Environment, Food and Rural Affairs (Defra), involves the Woodland Trust, the National Trust and the Food and Environment Research Agency (Fera) as partners. Using 'citizen science', it will create a UK-wide integrated Tree Health Early Warning System (THEWS). This will aid early identification of tree health problems, by engaging citizens, volunteers and civic societies in reporting on tree health. It will directly support the delivery of the government's Tree Health and Biosecurity Action Plan and will also involve the wider FC, Natural Resources Wales, other UK stakeholders, and the European and Mediterranean Plant Protection Organization (EPPO).

The heavy rain, storms and flooding in late 2013 and early 2014 have led to increased interest in our work on how woodland can reduce the impacts of flood events.

At the core of our business is our on-the-ground presence in England, Scotland and Wales, and strong working relationships with a range of universities, NGOs, governmental, devolved administration and science agency partners. Our work with the Earth Trust and Future Trees Trust resulted in the joint production of a strategy for the improvement of broadleaved trees in Britain and Ireland, 'A future with broadleaved trees', launched in October at a Parliamentary Reception hosted by Ed Vaizey MP.

I would like to thank Forest Research staff for their continued enthusiasm, expertise, hard work, commitment and willingness to go the extra mile, which underpins our successes. We also acknowledge and appreciate the support, cooperation and contribution that all our partners and forest-sector stakeholders bring to our joint projects. We look forward to continuing this work over years to come.

Dr James Pendlebury
Chief Executive

Forest Research Corporate Plan Key Actions – Progress Report

Key Action	Commentary
1 Actively contribute to the delivery of the Tree Health and Plant Biosecurity Action Plan and provide expertise in support of the government's Tree Health and Plant Biosecurity Expert Taskforce and Chalara Control Plan.	**Achieved:** Forest Research (FR) contributed to 13 bids for funding under the Living With Environmental Change Tree Health (Phase 2). Phase 2 funded seven successful bids and FR is a member of each. FR has: contributed to Defra reviews on UK tree health research capabilities; supported work on the Interim UK Plant Health Risk Register; contributed to the UK Plant Health Strategy Evidence Group and to workshops on Methods for Prioritising Tree and Plant Pests and Pathogens; and attended a number of Defra-initiated Plant Health Summits. We continue to work on the Defra-funded acute oak decline (AOD) project and projects on: public perceptions of management for tree health; spread of Phytophthora species by livestock; and Massaria of plane trees, each of which has received funding from the Defra Rapid Evidence Projects portfolio.
2 With partners, deliver elements of citizen science-based research, such as ObservaTree and OPAL initiatives. These projects will be delivered, in part, by the integration of citizen science initiatives with FR's existing UK-wide advisory and extension service.	**Achieved:** FR and its partners (Fera, the Woodland Trust and National Trust) submitted a successful bid for funding on ObservaTree to the LIFE+ Programme. FR supported OPAL training events in Kew, Wales, Alice Holt, Edinburgh and Leicester, and helped to staff the silver medal-winning garden at the Chelsea Flower Show. FR pathologists were also invited speakers at the Cheltenham Science Festival. Our commitment to providing free advisory services to the public continues. We have also distributed an AOD newsletter to over 300 interested contacts.
3 Participate in and/or lead on research to provide evidence and management solutions for damaging or potentially high-risk disorders. This will include research on Phytophthora (*P. ramorum, P. lateralis, P. austrocedrae* and *P. kernoviae*), Dothistroma needle blight (DNB), *Chalara fraxinea*, acute and chronic oak decline, horse chestnut bleeding canker; pine-tree lappet moth, oak processionary moth (OPM), Asian and citrus longhorn beetles, *Hylobius, Dendroctonus micans* and pine wood nematode.	**Achieved:** FR continues to process Phytophthora samples from England, Scotland and Wales. We are comparing UK isolates of *P. austrocedrae* with Argentinean isolates for differences in growth rates and morphology. We supported *P. austrocedrae* outbreak management team meetings and subsequent field visits to juniper sites in Teesdale, Yorkshire Dales and the Lake District. FR also participated in a number of outbreak management team meetings for *Phytophthora lateralis.* As part of our work on DNB, we supported an FC Scotland-led trial looking into the potential for using aerial spraying of fungicides for the control of Dothistroma in pine forests. We also chaired the DIAROD (Determining the invasiveness and risk of Dothistroma) COST Action sessions at the joint International Union of Forest Research Organisations/DIAROD COST Action meeting in Czechoslovakia. FR has started a Defra-funded project on the 'Social and economic analyses supporting the implementation of the Great Britain Dothistroma Needle Blight Strategy' and is working with colleagues from Fera, Bangor and Brunel Universities to understand the barriers to disease management. We also carried out the processing of the annual DNB survey. Working with partners, we established ash screening trials at 14 sites in east and south-east England. We continue to participate in the EU COST action 'FRAXBACK'. We are also prototyping low-cost spore trapping devices to detect and quantify spore inoculum of *Hymenoscyphus pseudoalbidus* (and potentially other tree pathogens). We commenced a major Defra-funded contract on AOD with a scientific workshop that attracted 50 invited delegates from across the forestry sector, and are supporting a PhD studentship on the role of *Agrilus biguttatus* in AOD, supervised by staff at FR and Harper Adams University. We have also given presentations on AOD to the Arboricultural Association Conference, the British Mycological Society Conference and the British Society for Plant Pathology. Several chronic oak decline (COD) site visits have been made and dendrochronology work on COD trees is nearing completion. FR has written a chapter entitled 'Horse chestnut bleeding canker – a 21st century pathogen' that will soon be published in *Challenges and opportunities for the world's forests in the 21st century*. Our geneticists continue to analyse pine-tree lappet moth mitochondrial DNA sequences to determine whether the Scottish population near Inverness is an introduction, and if so from where. FR authored the FC Practice Note on *Monitoring oak processionary moth with pheromone traps*, published in July 2013. We also assisted in the planning and monitoring of aerial spraying of woodland near Pangbourne. We have been conducting pheromone trapping work in the Royal Parks in London, and are hosting a new PhD studentship on OPM funded by FC England and supervised by FR, University of Southampton and the Organic Research Centre.

4 Evaluate the risk from other significant tree and forest pests and diseases, and ensure the provision of evidence to support risk assessment, contingency planning and compliance.	**Achieved:** We undertook a PERMIT Cost Action Short-Term Scientific Mission to Russia (Moscow and surrounding area) to study damage caused by the emerald ash borer (EAB, *Agrilus planipennis*). We found that the beetle has spread 240 km west and north-west from Moscow and 150 km or more to the south. The latter is significant as it takes the beetle into the natural range of *Fraxinus excelsior*. A subsequent paper was published in *Forestry* and an interview given to the BBC.
5 Provide research and advice to support national and international tree health regimes and regulation.	**Achieved:** FR's tree health team has supported over 50 forest health and training events across GB. For example: tree health training for FC Scotland (Ae, May); two Forest Health days for Natural Resources Wales (north and mid-Wales, July); Royal Forestry Society Field Day (East Anglia). FR has continued to provide evidence for policy development; for example, we have worked with FC Scotland colleagues to review policies concerning confirmed larch infections in Scotland and considered recent surveillance flights that have shown increased areas of affected trees in many UK locations. Plant Health Officers from England and Wales have also visited FR to discuss and view *Phytophthora ramorum* diagnostic processes. We assisted USDA-APHIS staff in collating a pest datasheet for *P. austrocedrae*. We have answered queries from, and supplied information to, the Canadian Food Inspection Agency on bacteria associated with AOD. We hosted a visit from SCION (New Zealand) tree health research staff to exchange knowledge on tree health issues, and attended a meeting for COST Action on Pathways Evaluation and pest Risk Management in Transit (Treviso, Italy).
6 Undertake research to predict the potential impacts of both new and emerging pests and pathogens, and model the impact of climate change on existing pests and pathogens.	**Achieved:** FR entomologists have established insect trap experimental plots in Hafren and Radnor forests and begun a sampling programme as part of the 'climate change and spruce pests' project. Climex mapping has been used to show the potential interactions of factors such as temperature and altitude with distribution of AOD and *Agrilus*. We co-authored a paper published in *Science* in November 2013: Boyd, I. L., Freer-Smith, P. H., Gilligan, C. A. and Godfray, H. C. J.: 'The consequences of tree pests and diseases for ecosystem services.'
7 Publish a Practice Guide and a Research Note to assist the forest sector in promoting the recovery of acidified waters in forested catchments.	**Partly achieved:** A Research Note, *Forestry and surface water acidification*, was published in March 2014. A Practice Guide has been submitted to the FC and is awaiting final production.
8 Provide advice and strategic maps to the water and forestry sectors identifying priority areas for woodland creation to help reduce downstream flood risk and diffuse water pollution.	**Advice – part achieved:** Work on strategic opportunity mapping has been delivered for the Midlands and Yorkshire and North East Environment Agency Regions, the River Tay Priority catchment and Glasgow and Clyde Valley.
9 Undertake research to improve estimates of soil carbon stocks within UK forests and how forestry management can best protect these.	**Achieved and ongoing:** The BioSoil2 project has selected, sampled and analysed soil from 42 additional forest sites to improve estimates of soil organic Carbon (C) stocks in peaty gley soils, and to cover soil types which were under-represented in the BioSoil project. The data will be used to help update national soil C stocks and assess C stock variations under changing land use. Work is ongoing on modelling soil C under short-rotation forestry in UK conditions and on soil C modelling and greenhouse gas fluxes with the internationally accepted process model 'DNDC'. FR has also been advising the FC on the management of peat soils and land remediation sites, and linking this to consideration of species selection and forest management.
10 Report findings to Defra and the FC from the three-year investigation into the effects of woodland management and deer browsing on woodland structure and woodland birds.	**Ongoing:** A report was submitted to Defra and the FC in April 2014, outlining recommendations about woodland stand structures that are beneficial for breeding birds in broadleaved woodland.
11 Release a test version of MOSES-GB (a growth and yield model) that will help improve understanding of the impact of alternative forest management approaches on stand development.	**Achieved:** An interim version of MOSES-GB was released to selected FR and FC staff in March 2014. The Scottish Forestry Trust, the FC and Bangor University have funded a three-year PhD studentship at Bangor University supporting the work on MOSES-GB.

Forest Research Corporate Plan Key Actions – Progress Report (continued)

12 Publish, in a peer-reviewed journal, work concerning Sitka spruce DNA-markers associated with an important economic trait.	**Ongoing:** A near-final draft is available but the paper, jointly authored with the Roslin Institute, is with our partners for finalising prior to submission.
13 Launch a Research Forest at the Queen Elizabeth Forest Park in the Loch Lomond and Trossachs National Park.	**Achieved and ongoing:** The Research Forest was launched on 18 March 2014. As part of earlier awareness activity, FR supported an FC Scotland-led 'Climate Ready Workshop' in the Park (October 2013), held in association with ClimateXChange.
14 Install a new flux tower at a conifer site within Harwood Forest (Northumberland), in order to extend our expertise and knowledge regarding atmospheric gases and climate change.	**Achieved and ongoing:** A new tower was installed at Harwood Forest (July 2013) within and above the canopy of a mature Sitka spruce stand to allow continuous measurement of the carbon and greenhouse gas balance of the stand.
15 Contribute to the review of the National Forest Inventory (2014) and, specifically, considerations regarding a new tree canopy cover metric.	**Achieved and ongoing:** FR discussed the review and the proposed metric with colleagues at the FC's inventory team (IFOS). We provided input as required to IFOS and they will be providing a report on this metric later this year.
16 Participate in the England Woodland and Timber Partnership (ETWP), its sub-group on innovation, and the industry-led work on forest-based supply chains.	**Achieved and ongoing:** FR contributed to ETWP from its inception and until its closure in late 2013. We developed and chaired its innovation sub-group and represented it at the ConFor Forestry Show (September, Exeter).
17 Consult upon, and launch, a refreshed Forest Research Communications Strategy.	**Achieved and ongoing:** Following consultation, a Communications Strategy was approved (December). The strategy has been disseminated and will be used to guide and develop our future communications activities. Part of this work will involve redeveloping our website.
18 Upgrade FR's website to increase its use, desirability and accessibility to our customers and users.	**Ongoing:** A new webmaster was recruited in September 2013 and a number of improvements are now underway in respect of our web presence.
19 Publish, each quarter and on our website, information on all FR's knowledge exchange activities.	**Ongoing:** The first quarterly report was presented to FR's Executive Board (FREB) at the end of June 2013. Follow-up papers were also presented to FREB in July and November 2013, and February 2014. Knowledge exchange activities were updated on the website three times in 2013–14.
20 Participate in a minimum of 20 knowledge exchange events to the forestry and land-use sector, and make presentations available on the FR website such that non-attendees can also access information.	**Achieved:** To date, and aside from the 50 tree health events mentioned above (5), FR staff have contributed to 23 conferences, given eight seminars, and presented at 17 training courses and 13 workshops. We continue to advocate and use different mechanisms to disseminate our research, for example two e-lectures on forest health and silviculture were given in association with the Canadian Institute of Forestry, attracting over 1,100 attendees, and the technical seminar series from our Northern Research Station (NRS) has been made accessible as webinars.
21 Organise a workshop on the Restoration of Forest Landscapes and Mitigation of Climate Change, as part of a major contribution towards the 3rd International Congress on Planted Forests.	**Achieved:** The workshop was held in Dublin (May 2013) and attended by 68 participants from 19 countries. The workshop report contributed to the plenary congress – the 3rd International Congress on Planted Forests – from which conclusions and recommendations were published by the Food and Agriculture Organization (FAO). Papers from the workshop and Congress will be published in a special issue of the *New Zealand Journal of Forest Science*, which FR is guest editing.
22 Record how our work has contributed towards: Defra's Plan for Growth, the government's response to the Independent Panel on Forestry (in England) and the FC's Science and Innovation Strategy (SIS).	**Achieved:** FR has actively contributed to expertise on forestry matters to government and devolved administrations. FR board members are fully engaged with the FC's Woodland Policy and Enabling Programme and Defra's one network evidence programmes. FR held all-staff meetings with FC colleagues regarding the SIS, which was launched by the Government Chief Scientific Adviser, Professor Sir Mark Walport at NRS on 14 March 2014.
23 Deliver the agreed annual business plan and secure a total of £3.5 million (provisional) of income from non-FC GB sources.	**Achieved:** External income targets were exceeded and FR secured £4.8 million of non-core income. FR works with, and for, a number of partners and customers, and their support is gratefully acknowledged.

24 Strengthen relationships and partnership working with the forestry sector across government, devolved administrations, international forestry research organisations and our partners in European forestry projects.	**Achieved:** FR has established a number of service level agreements with FC operations in Scotland and England, and with Natural Resources Wales and the Department of Agriculture and Rural Development in Northern Ireland. FR also has Memoranda of Understanding (or equivalent) with many organisations such as Kew, James Hutton Institute and Fera, and works in a wide variety of partnerships and collaborations with many organisations, such as Future Trees Trust, Woodland Heritage, Trees4Future, Scottish Natural Heritage, the Woodland Trust and National Trust. FR staff continue to play important roles in international organisations such as IUFRO and the European Forest Institute.
25 Further develop the capacity of Forest Research in Wales, working with the Welsh Government, Natural Resources Wales and both new and existing customers and partnerships.	**Achieved:** FR met Natural Resources Wales and Welsh government colleagues in Cardiff and the Royal Welsh Show (July 2013); research leaders from Natural Resources Wales subsequently went to NRS and met a number of FR staff (August 2013). Following the retirement of Prof. Hugh Evans (April 2014), FR has recruited Tom Jenkins as our new Head of FR in Wales.
26 Acting upon the Forest Research External Review, we will review the progress of research programmes and evaluate interdisciplinary working.	**Achieved:** The FC has established an Expert Committee on Forest Science, chaired by Prof. Julian Evans. Its first meeting was in October 2013 and it subsequently met at NRS in January 2014 and in Cardiff in March 2014. An internal FC review of our research programmes judged them to be performing well and noted there was good interdisciplinary working across FR.

About Forest Research

Forest Research is the Forestry Commission's Research Agency and is the UK's foremost body for forest and tree related research.

Background

The overall objective of the Forestry Commission (FC) is to lead the development and promotion of sustainable forest management and to support its achievement internationally. Forest Research (FR) is the FC's research agency and main research provider.

FR's Aim

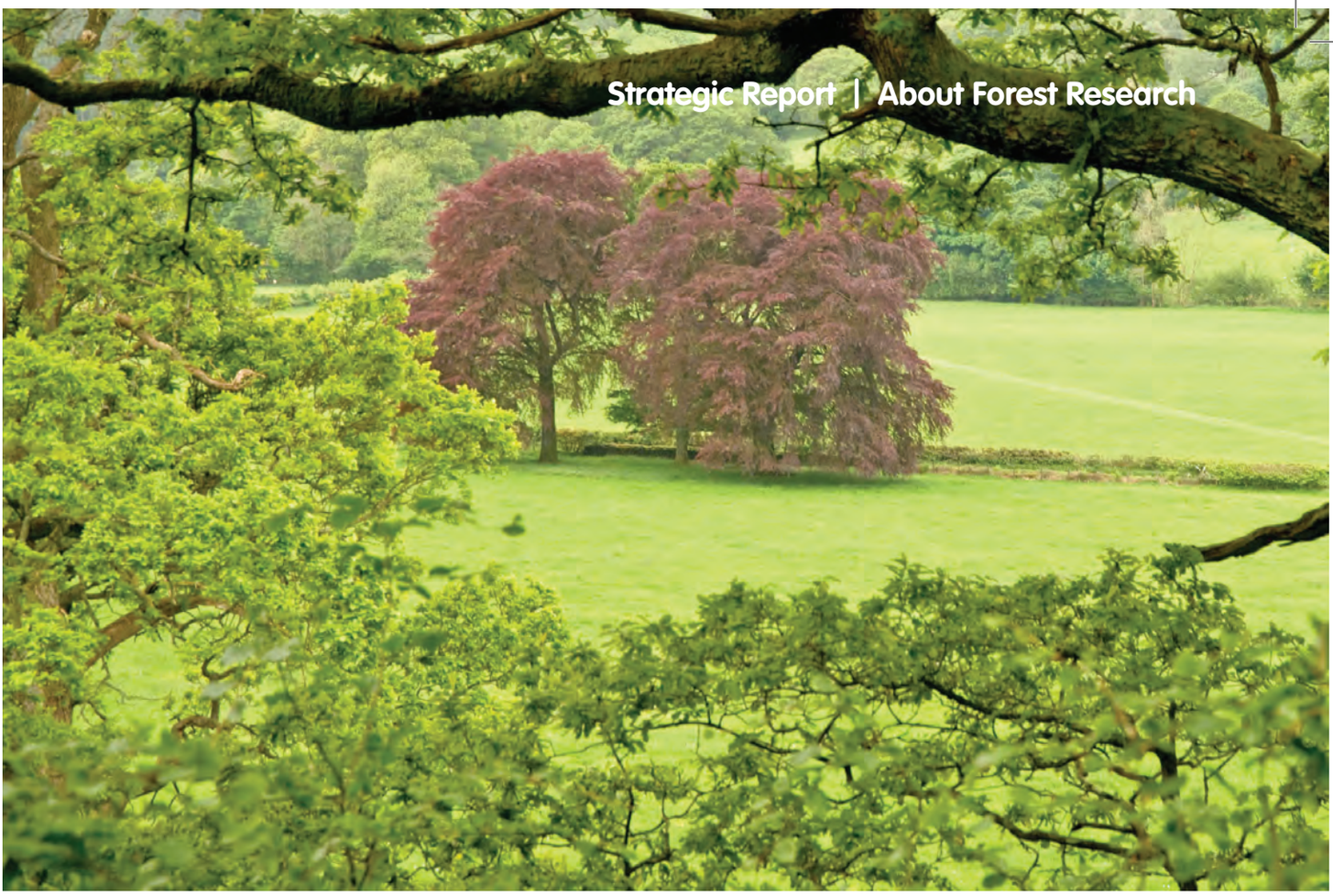
To be a robust, market-relevant and flexible research organisation with a reputation for innovative applied science.

FR's Strategic Objectives

1. To provide robust science to inform the development and delivery of UK government and devolved administration forest policies.
2. To provide innovative applied research, development, monitoring and scientific services to UK, European and international forestry stakeholders.
3. To transfer research knowledge directly, or in partnership with others, to UK and international audiences.

Research funding

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 government and the devolved administrations of Scotland, Wales and Northern Ireland. In addition, FC England, FC Scotland and Natural Resources Wales purchase research, development 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 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.

Our projects provide understanding, policy advice and guidelines on the implementation of best practice (on issues such as forest hydrology, 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. The protection of woodlands from pests and diseases, and predicting the impacts of environmental change are also overarching themes.

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 consideration of social and economic issues. The Agency also carries out work on genetic conservation, tree improvement, seed testing, method studies, product evaluation, crop inventory, surveys and monitoring.

Resources

FR currently employs 185 (full-time equivalent) staff at Alice Holt Lodge in Hampshire, the Northern Research Station near Edinburgh, our office in Aberystwyth, and at field stations across England, Scotland and Wales. Contact information is given on the back cover.

Our Research

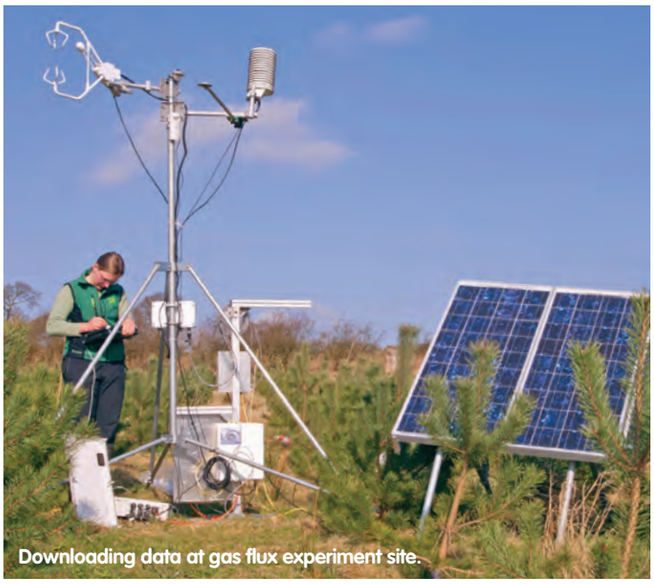
During the past year, Forest Research has continued to address its objectives through a combination of research in Britain's forests and woodlands and in the laboratories of our two research stations. Here, we present some examples and highlights to illustrate the range of our current research.

Ash dieback: finding resistant trees

Ash dieback (*Chalara fraxinea*) is affecting ash trees in Britain, especially East Anglia and Kent. This is a very serious disease of one of our major native tree species and, at present, there is no known cure, although research is ongoing to better understand the fungus and its behaviour (see page 16). In spring 2013, Forest Research and the Department for Environment, Food and Rural Affairs (Defra) began a mass screening trial to identify inherent resistance in ash trees. We have planted 14 trial sites in East Anglia and Kent with 155,000 disease-free ash saplings from ten British seed zones, a UK seed orchard of ash already selected for its better form and growth rate, two Irish sources, one French source and one from Germany.

Our researchers will monitor the saplings, in replicated experimental plots, for the next five years. We intend to use any individual trees that show resistance to the disease to raise new planting stock, which will allow the planting of Chalara-resistant ash back into the UK countryside. For more information, see **www.forestry.gov.uk/fr/chalaratrials**

A trial site planted with ash saplings.



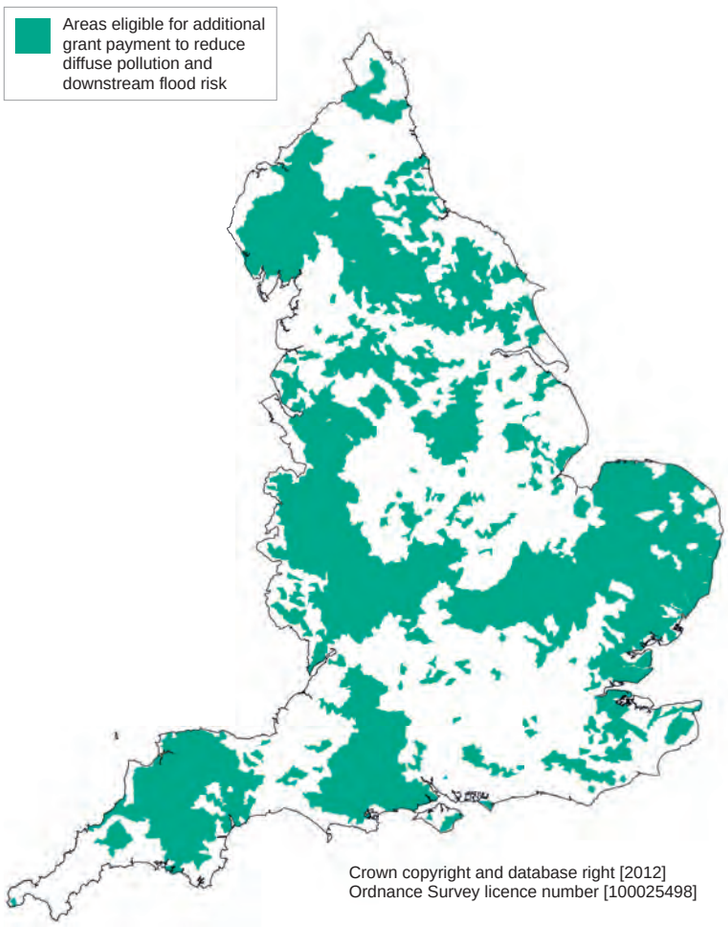
Downloading data at gas flux experiment site.

Modelling land use for bio-energy

Forest Research is participating in a national consortium to produce a framework for predicting where crops can grow in the UK as sources of bio-energy. The Ecosystem Land Use Modelling & Soil C Flux Trial (ELUM, www.elum.ac.uk) is commissioned and funded by the Energy Technologies Institute. It is a unique collaboration between field experimentalists and data modellers across seven UK institutions, making state-of-the-art assessments of the flow of carbon through soils and crops. This year we have studied carbon dioxide uptake and release by young, short-rotation forests and also the effects of harvesting on carbon fluxes in willow coppice. Process models will use data from all energy crops to estimate and map the opportunities for UK bio-energy crops up to 2050. The spatial mapping tool and project field data will be available to researchers and the wider community, including policy-makers, land planners and industry. For further information, see **www.forestry.gov.uk/fr/carbonandghgbalance**

Promoting woodland for water

Research and experience have shown that well-planned and managed woodland can help to protect the water environment and reduce flood risk. Our scientists have been working closely with the Forestry Commission, Environment Agency, Natural Resources Wales and Scottish Environment Protection Agency to identify where woodland creation might best deliver these benefits to society. This has led to the development of 'opportunity mapping' to direct new planting to where improvements to water quality and the attenuation of flood flows are most needed. We have helped to produce national, regional and catchment maps to underpin the introduction in England of an additional grant payment to encourage woodland creation for water. By October 2013, over 900 hectares of planting had been approved, with another 1300 hectares in the pipeline. Further work is underway to extend and update the opportunity maps in England, Scotland and Wales to help inform the development of the next Rural Development Programme. For more details, see **www.forestry.gov.uk/fr/woodlandforwater**



Priority areas in England for woodland creation to reduce flood risk and/or diffuse water pollution.

***Abies amabilis* in the Kilmun Forest Garden.**

A new look at silver fir

Increasing the resilience of forests to biotic threats and climate change is a key challenge for forestry in Britain. One method of achieving this is to increase species diversity, since in the past a relatively small number of species have been used. Forest Research has reviewed the potential role of silver firs (*Abies* spp.) as we believe that several species have the potential for much wider use since they can be highly productive and will grow on a wide range of sites. They are also ideal for use in continuous-cover forestry, as they can grow well in shaded conditions. That said, the genus has not previously been favoured for use in the UK because of concerns about the silver fir woolly aphid (*Adelges nordmannianae*) and, consequently, there are only 8,000 hectares of planted silver firs in Britain. However, the review has shown that the genus is not as badly affected by the aphid as initially thought.

We have identified four species that grow well in our current climate and could be used more widely (*Abies alba, A. amabilis, A. grandis* and *A. procera*) and ten other potentially useful species, some of which are from southern Europe, that could be useful in a warmer, drier environment. Further work on these potential species is required to examine where best to collect seed to ensure that trees will survive and grow optimally where they are planted, and to assess the quality of the timber they will produce. For more information on silver fir and other tree species, visit **www.forestry.gov.uk/fr/treespecies**

Treatment against Dothistroma needle blight in Scotland.

Aerial spraying trials

Tackling pest and disease outbreaks in forestry is challenging, because of the remoteness of many forest sites and the technical problem of how to treat large blocks of mature trees. The most efficient method of applying control treatments in these situations can be to spray the trees from the air. In 2013, Forest Research, working closely with the Forestry Commission in England and Scotland, and other agencies, carried out two trials of aerial application of fungicides and pesticides. These were the first such trials in the UK since the 1990s.

At Pangbourne in Berkshire, we sprayed 10 hectares of oak woodland by helicopter with the biological insecticide *Bacillus thuringiensis* to combat an outbreak of oak processionary moth. In Scotland, we carried out helicopter trials to evaluate the effectiveness of applying copper fungicide as a treatment against Dothistroma needle blight on pine (see **www.forestry.gov.uk/fr/dothistromaaerialspray**). Both trials involved detailed studies to assess how much of the spray was deposited on the foliage, how much reached the ground, and the impact on other species and the wider environment. The data collected from this monitoring work will inform future decisions on the use of aerial spraying and indeed as part of this work we will be undertaking further trials to test efficacy during 2014.

Engaging with private land owners

Two-thirds of Britain's forest area is privately owned. This means that forest policy goals, such as woodland expansion, sustainable forest management and adaptation to climate change, all require involvement of the private sector. Policy-makers are often concerned about low levels of interest by the private sector in establishing new woodland, managing existing woodland and timber production from private woodlands. Over the past year, Forest Research has been carrying out several studies focusing on landowners and their choices. Our findings show that, despite official worries, many woodland owners see themselves as managing their woodlands. However, our research in Scotland does highlight a reluctance to establish new *productive* forest. Research in North Wales suggests that woodland managers are not convinced of a need to adapt to climate change and are generally more worried about tree disease.

Policy relies largely on grants to persuade landowners to change practice, but all of our studies indicate that the quality of advice and the way in which it is provided are crucial. Land-use advisory systems tend to replicate the forestry/farming split. Private-sector forest agents (or consultants) are the main influence in commercial forest management, while farmers mostly talk to agricultural advisors. Our future work will focus on the development of comprehensive advisory systems to support integrated land use. For more details, visit **www.forestry.gov.uk/fr/privatelandowners**

Establishing new woodland.

Expertise and training in soils

Soils are fundamental to sustainable silviculture, healthy trees and diverse woodland ecosystems. If soils are misunderstood or unwisely managed, diverse, productive, sustainable and profitable woodland will decline. Once started, processes of soil degradation can be impossible to halt. Knowledge about soils has been lost by many in the environmental sector and the misconception is widespread that 'trees can grow anywhere, on anything'.

Climate change, and tree pests and diseases, make it essential that real thought is given to species selection. This requires an objective understanding of site, soils and their interaction with trees and vegetation. Demand for this expertise in soils and its application to silvicultural or site management options is rising, as shown by growing requests for Forest Research experts to provide training events. The disciplines of soils and silviculture are increasingly interlinked with other research and evidence programmes. Forest Research specialists in these areas are central to expanding the understanding of these links. For further details see **www.forestry.gov.uk/fr/soiladvice**

Eucalyptus is not just for koalas!

The UK is committed to generating increasing amounts of energy from renewable sources, including biomass. Short rotations of fast-growing trees with high wood density have the potential to deliver greater volumes of biomass than alternative biomass crops. In spring 2010, we planted promising eucalyptus species (*E. nitens, E. gunnii* and *E. glaucescens*) at 12 sites to evaluate their response to current climatic conditions. Average winter temperatures in the UK have been rising since the previous major series of UK Eucalyptus trials. However, the following very severe winter killed almost all of the seedlings except in the south-west of England where survival was 55% for *E. nitens* and over 90% for *E. gunnii* and *E. glaucescens*.

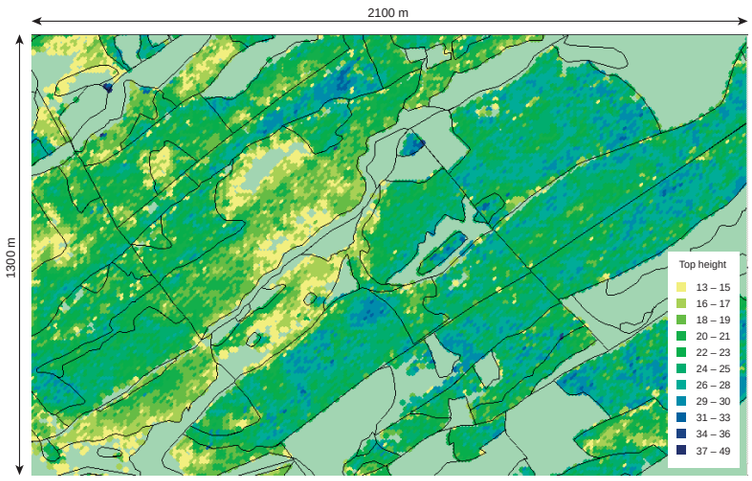
By 2013, after three years, the trees in the south-west had grown to 450–513 cm tall, with diameters (at 1.3 m) of 4.6–6.3 cm. We plan to assess growth regularly and will measure biomass when the plots are harvested. The interim conclusion is that, within the UK, these eucalypts have significant potential in mild climates but increasing risk of high mortality on colder, frostier sites. For more on short-rotation forestry, see **www.biomassenergycentre.org.uk/srf**

Teaching about soils.

Laser technology to assess forest growth

Height assessments are central to the planning of forest management and to production forecasting. For example, the increase in height of a stand of trees can help to model volume growth and gauge the likely products after harvesting. From the ground it is difficult in dense forests to see the tree tops to measure height. To solve this problem, Forest Research has been assessing the use of remote sensing equipment mounted on a plane flying over the forest. LiDAR (Light Detection And Ranging) equipment, using laser pulses, can measure tree height from above.

We compared LiDAR measurements for plots of 10 m square with ground measurements from representative plots in Aberfoyle forest. The resulting data from the two height assessment methods showed a close correlation (95%). The same LiDAR method has been used to estimate yield class for forest stands with 93% accuracy compared to field methods. We are therefore confident of using LiDAR to estimate height for the forest as a whole, allowing managers a comprehensive view of their stands, including the variability within compartments. With help from the Cowal and Trossachs Forest District, we are now evaluating the business potential of using LiDAR height estimates in commercial forestry management.



Map of tree top height calculations from LiDAR remote sensing.

Tree health update

Our tree health experts carry out research to provide evidence and management solutions for a variety of both native and newly established exotic problem species. Our approach is to understand the nature and reasons for the observed problems and to apply this knowledge to sustainable management of the organisms concerned. Further information on a range of projects to protect trees from pests and pathogens is available at **www.forestry.gov.uk/fr/protectingtrees**

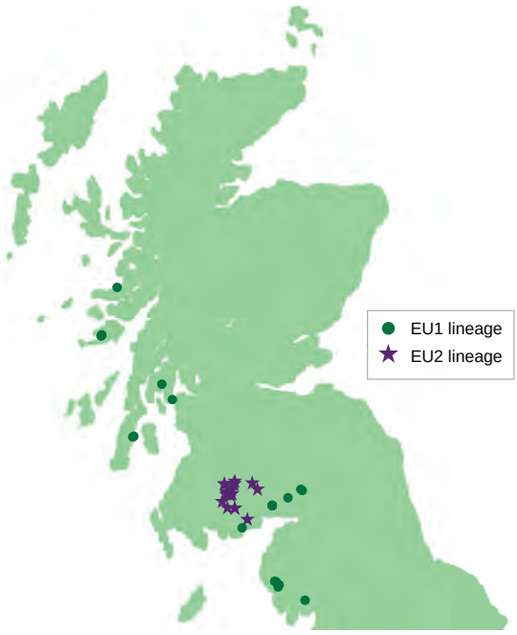
Browning of ash leaf caused by *Chalara fraxinea* fungus.

Chalara

Chalara fraxinea, the fungus that causes ash dieback, has a genetic recognition system known as vegetative compatibility (vc), which is the fungal equivalent of tissue-rejection systems in humans. This enables a fungus to distinguish between self and non-self in both culture and nature, allowing colonies of the same vc-type to fuse, forming a single individual, whereas those of a different vc-type remain separate.

In the case of *C. fraxinea*, our intensive sampling at three different UK sites revealed that almost every pathogen individual was of a unique vc-type, suggesting high individual genetic diversity even at very local levels. This has implications for the biology of the pathogen and potential approaches for control. In particular, the vc system of *C. fraxinea* could aid its ability to defend itself against other competing fungi as it persists in fallen ash leaves in the litter, as well as allowing it to resist viral attack. The journal *Fungal Ecology* published these research findings in December 2013. For information on Chalara, visit **www.forestry.gov.uk/chalara**

Petri dish showing a vc reaction between two samples of *Chalara fraxinea* with different vc types.



Map of Scotland showing distribution of *P. ramorum* EU1 and EU2 lineages.

Phytophthora ramorum

The EU1 genetic lineage of *Phytophthora ramorum* is now present in many locations in western Britain, but recently a new lineage of the pathogen (EU2) has been discovered in south-west Scotland. Tests show that EU2 has the capacity to be especially damaging to Japanese larch, killing the bark of affected trees more quickly and more extensively than EU1. The arrival of EU2 may be one reason why ramorum disease has expanded significantly during 2012 and 2013 in the Dumfries and Galloway area of Scotland, with around 4000–6000 hectares of larch now thought to be affected.

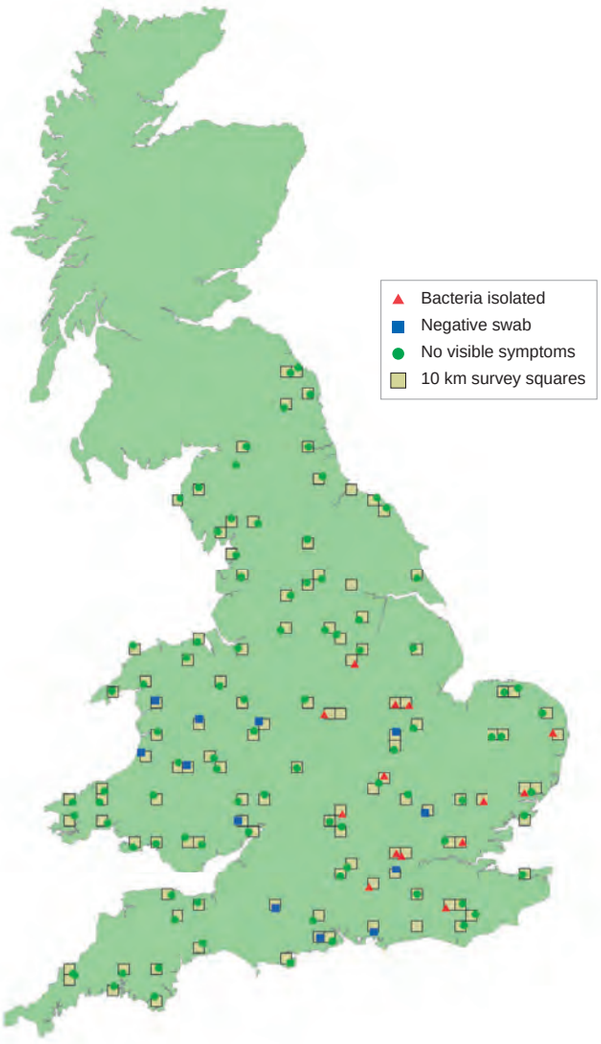
We are tracking the spread of EU2 *P. ramorum* in Scotland using a DNA-based diagnostic method that not only detects *P. ramorum* directly in the bark of affected larch trees, but also identifies its genetic lineage. This will enable us to monitor the likelihood of spread to other parts of Britain.

Japanese larch dieback due to *Phytophthora ramorum*.

Acute oak decline

In spring 2013, Forest Research began a Defra-funded project, 'An improved understanding of the causes, distribution and scale of acute oak decline in the UK'. For this research we developed and optimised a rapid diagnostic tool using quantitative polymerase chain reaction (qPCR) to verify whether the bacterial species implicated in acute oak decline (AOD) – *Gibbsiella quercinecans* and *Brenneria goodwinii* – were present on the non-invasive swab samples taken at sites that had trees with stem bleeding.

The project includes a two-year, structured survey to determine the extent of AOD in England and Wales, and makes use of the swab sample tests. To date, we have surveyed 128 sites and sampled 29 sites for possible AOD; of those, 18 (62%) tested positive for the AOD bacteria and were thus confirmed AOD sites. Any negative test results were cross-compared with photographs to confirm them as true negatives. No positive samples were recorded in Wales but in England the known northern boundary of AOD was extended to Mansfield (Nottinghamshire). Further survey and use of these diagnostic tools will be used to refine our understanding of the known extent of AOD. For more information, see **www.forestry.gov.uk/fr/acuteoakdecline**



Survey squares and results of non-destructive, rapid testing for *Gibbsiella quercinecans* and *Brenneria goodwinii*.

Dark weeping patches on an AOD-infected tree.

Emerald ash borer

Forest Research scientists visited Russia in July 2013 to gather information on the spread and impact of emerald ash borer (*Agrilus planipennis*). This invasive species is not found in the UK but was first found in the Moscow region in about 2003 and has since killed more than one million ash trees in the city and in the surrounding region. The beetles appear to be spreading along the main motorway routes. During our research visit, we found signs and symptoms of damage up to 230 km west and south of Moscow city centre, showing that the beetle has spread into the natural range of European ash (*Fraxinus excelsior*). The journal *Forestry* published our findings in December 2013.

An emerald ash borer.

Courtesy of Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Bugwood.org

Sustainability Report

Overview

Forest Research continues its support of ISO 14001 and successfully received its renewed certification in June 2013. This renewal was overseen by independent assessors and is valid, subject to ongoing compliance and assessment, for the next three years.

Over the past year, we have continued our efforts to reduce our environmental impact. We have installed new, energy-efficient boilers at our offices at the Northern Research Station (near Edinburgh) and Alice Holt (Surrey), and fitted over 100 double glazed windows at Alice Holt. We fully expect that these measures will help reduce our future energy demands and make the buildings easier to heat, warmer and more pleasant places to work. On a day-to-day basis, Forest Research continues to reduce its environmental impact wherever possible. This includes reducing business travel and using alternative mechanisms such as Skype, video conferencing and teleconferencing. Business sustainability remains a standing agenda item at the regular meetings of the Site Management Committees, at which all teams are represented.

The Reporting Requirements table gives information on travel, energy, waste and water. Reductions in greenhouse gas emissions, energy use and waste reflect the combination of past and present investment in new facilities (such as the installation of more-efficient gas boilers) and the ongoing efforts of staff to consider how they carry out their day-to-day business activities. Waste figures are much reduced; the high levels in the previous year were a result of the demolition of buildings and construction of new offices at Alice Holt. Water usage has increased as a result of the nature of the research that we are undertaking, with increasing use of irrigation systems in nurseries and greenhouses, and humidifying systems in new growth rooms.

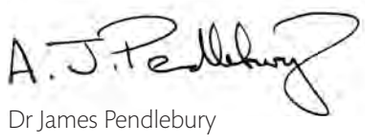
Financial and non-financial information

We present the following information in a format consistent with HM Treasury's Sustainable Reporting guidance.

Reporting requirements

Performance measurement		2013–14 Performance		2012–13 Performance	
Area		Actual (Qty/Cost)	Target	Actual (Qty/Cost)	Target
Travel (including national and international air/rail travel)	Amount (tonnes CO_2e)	339	• 10% reduction on baseline (actual: 6% decrease)	361	• 10% reduction on baseline (actual: 6% increase)
	Expenditure	£451,644		£402,992	
Electricity, gas and other heating fuels (Estate)	Consumption (kWh)	2,659,800	• 12% reduction on baseline (actual: 5% decrease)	2,798,171	• 12% reduction on baseline (actual 8% increase)
	Expenditure	£188,830		£155,191	
Total energy [1]	Expenditure	£640,474		£558,183	
Estate and office waste [2]	Amount (tonnes)	204	• < 20% landfill (actual: 9%) • ≥ 80% recycling (actual: 94%) • Nil incinerated • 10% overall reduction in weight (actual: 67% decrease)	626	• < 20% landfill (actual: 9%) • ≥ 80% recycling (actual: 90%) • 1% incinerated • 10% overall reduction in weight (actual 44% increase)
	Expenditure	£15,646		£110,612	
Estate and office water	Quantity used (m^3)	9,681	• 8% reduction on baseline (actual: 15% increase)	8,414	• 8% reduction on baseline (actual 20% increase)
	Expenditure	£11,475		£8,682	

[1] Total energy is the fossil fuel consumption of the built estate (heating and lighting, etc.) and the CO_2 from travel.
[2] Waste includes sewage and WEEE.



Dr James Pendlebury
Chief Executive
27 May 2014

Directors' Report for the year ended 31 March 2014

1. Basis of accounts

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.

Management commentary

2. Status

Forest Research is a cross-border Government Research Agency and has been an Executive Agency of the Forestry Commission since 1 April 1997. It undertakes the major part of the Commission's research and development programmes as well as providing survey, monitoring and scientific services to the wider Forestry Commission and devolved administrations. The relationship between Forest Research, the Forestry Commissioners and Forestry Ministers is described in the Framework Document.

Under the Framework Document, Forest Research is funded from the sale of its services to both the Forestry Commission and external customers. Any annual surplus or deficit is counted in the Forestry Commission's net funding requirement.

3. Strategy

The strategic aims and objectives of Forest Research have been set to assist the Forestry Commission to achieve its objective to take the lead in development and promotion of sustainable forest management and to support its achievement nationally.

These are discussed in detail in Forest Research's Corporate Plan, which is available on the Forestry Commission website and the Forest Research website (www.forestry.gov.uk and www.forestry.gov.uk/forestresearch, respectively).

4. Relationships with stakeholders

The past year has continued to be a challenging one for forests, as reflected in our ongoing work on a range of pests and diseases. Forest Research and our many partners have continued to provide evidence and management information on a range of pests and diseases affecting our forests. These include: *Chalara fraxinea, Phytophthora ramorum, Phytophthora austrocedrae,* acute and chronic oak decline, pine lappet moth and *Hylobius abietis.* Forest Research staff support a number of outbreak management teams, for example on Chalara, Phytophthora and Dothistroma. The collaboration between Forest Research and the forestry sector – from nurseries to woodland owners, managers, processors and environmental non-governmental organisations – in dealing with these various outbreaks continues to be exceptional.

Forest Research has been extremely proactive both in handling an unprecedented amount of public and media interest and in disseminating the latest scientific and technical information to the sector to inform ongoing woodland or disease management decisions. To this end in particular, Forest Research organised and participated in over 50 plant health events during the year, covering a range of forestry pests and diseases across the UK.

Perhaps the best example of working with our stakeholders was the rapid delivery and establishment of a mass screening trial to identify Chalara resistance in ash trees. With fantastic support from a range of private, non-governmental and local authority landowners, excellent contractors and help from the nursery sector we fenced and planted 14 trial sites totalling 50 hectares in East Anglia, Kent and East Sussex with 155,000 disease-free ash saplings all in the space of five months.

Our securing of LIFE+ funding, with our partners the Food and Environment Research Agency (Fera), the Woodland Trust and National Trust, for the ObservaTREE initiative also highlighted our close links with the sector. This four-year citizen science project, also supported by the Department for Environment, Food and Rural Affairs (Defra), will focus on the early identification of tree health problems and, as well as citizens and volunteers, will also involve the Forestry Commission, Natural Resources Wales and the European and Mediterranean Plant Protection Organization.

In our role as the UK's leading scientific experts on tree health, we were also actively involved in supporting or contributing to government and devolved administration activities concerning tree health. These included contributing to Defra reviews on UK tree health research capability, supporting work on the Interim UK Plant Health Risk Register, contributing to the UK Plant Health Strategy Evidence Group, supporting workshops on Methods for Prioritising Tree and Plant Pests and Pathogens and supporting Defra-initiated Plant Health Summits hosted by the Defra Secretary of State.

5. Aims and objectives

The aim of Forest Research is to support and enhance forestry and its role in sustainable development, by providing high-quality research and development in a well-run organisation, as set out in the Framework Document. The objectives of Forest Research are listed on page 10.

Current and future development and performance

6. Operating review

During the past exceptionally busy year, Forest Research has:

- successfully delivered against the Key Actions in our 2013–14 Corporate Plan;
- supported the delivery of the Tree Health and Plant Biosecurity Evidence Plan (2013) and Defra's 10-point plan for growth (specifically point 4 – proactively safeguarding plant health);
- contributed to Defra reviews of UK tree health research capabilities;
- supported work on the Interim UK Plant Health Risk Register;
- contributed to the UK Plant Health Strategy Evidence Group and to workshops on Methods for Prioritising Tree and Plant Pests;
- provided research input to the Outbreak Management Teams and control strategies for established pests and pathogens *Chalara fraxinea*, Dothistroma needle blight, *Phytophthora ramorum* and *Phytophthora austrocedrae;*
- continued to support the UK-wide response to the Chalara dieback of ash – this included our field research staff inspecting and sampling trees across the UK;
- delivered or presented at over 50 plant health events across the UK;
- continued to grow its external income despite the challenging economic circumstances;
- working with partners, we established a mass screening trial to identify Chalara-resistant ash;
- undertook a PERMIT Cost Action Short-Term Scientific Mission to Russia (Moscow and surrounding area) to study damage by the emerald ash borer (*Agrilus planipennis*);
- provided strategic maps identifying priority areas for woodland creation to help reduce downstream flood risk and water pollution to the Midlands, Yorkshire and North East Environment Agency Regions and the River Tay and Glasgow and Clyde Valley catchments;
- produced and released a test version of MOSES GB, a growth and yield model, that will help improve the understanding of the impact of alternative forest management approaches on stand development;
- installed and commissioned a new flux tower at Harwood Forest in Northumberland in order to extend our knowledge regarding atmospheric gases and climate change;
- organised a workshop on the restoration of forest landscapes and mitigation of climate change as part of the 3rd International Congress on Planted Forests.

7. Financial review

Forest Research produced a net operating surplus of £318,000, compared to a net operating surplus in 2012–13 of £930,000.

A comparison of income and expenditure with the previous year's results shows that:

- other management costs increased by £332,000 (12.6%), mainly as a result of £349,000 being spent on replacement windows at the Alice Holt site;
- materials and services costs increased by £215,000 (9.0%), resulting from the use of contractors for the Defra-funded Chalara tree trials project;
- income from external customers (non-Forestry Comission GB customers) exceeded our Corporate Plan target by £1,266,000, and was £526,000 more than 2012–13 income.

After adjusting the total deficit for items not involving the movement of cash and for capital expenditure, bank account movements and income, the net cash inflow for the year was £375,000 which was paid to the Forestry Commission (2012–13: £238,000).

Additions to fixed assets in the year were £347,000 (2012–13: £362,000), on essential scientific and other equipment. A new Polycarbonate House at our Northern Research Station (Roslin) is in the course of construction, and will be completed during the first half of 2014–15.

8. 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 2013–14 the recovery rate was 102.4% compared with 107.3% in 2012–13.

Performance against other operational, scientific and financial Key Actions is reported in the main body of the *Annual Report and Accounts*. Forest Research achieved £4.8 million income from non-Forestry Comission GB customers against the Key Action target of £3.5 million.

9. Events since the balance sheet date

There were no significant post-balance sheet events to record (see Note 21).

10. 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 recent 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 GB and to fulfil its own Corporate Plan objectives for 2014–15 are as follows.

- Support the delivery of the Tree Health and Plant Biosecurity Evidence Plan (2013), emerging Plant Biosecurity Strategies and Defra's 10-point Plan for Growth (specifically point 4 – proactively safeguarding plant health), by continuing to research and provide evidence on the biology and management of a range of pests and diseases, including oak

processionary moth, acute oak decline, Dothistroma needle blight, *Phytophthora ramorum, Phytophthora austrocedrae,* Hylobius and Chalara.

- Support the delivery of seven tree health projects funded through Living with Environmental Change (LWEC).
- Progress the LIFE+ ObservaTREE project to develop a tree health early warning system and update the TreeAlert system for the reporting of tree pests and diseases.
- Actively horizon scan and contribute to contingency plans concerning pests and diseases on the pest risk register.
- Collaborate and launch the Ecosystem Services Community Scotland (ESCOM–Scotland). ESCOM-Scotland is a collaboration on ecosystem services research with core partners of Forest Research, the James Hutton Institute, University of Edinburgh Geosciences and the Centre for Ecology and Hydrology.
- Publish information to assist the forest sector in promoting the recovery of acidified waters in forested catchments.
- Provide advice on the impact of forestry on flooding and the use of woodland to mitigate flooding impacts.
- Provide advice on the potential for adopting behavioural policy 'nudges' to encourage woodland creation and management.
- Continue to provide updated information to the sector on forest resilience, including information and expertise on alternative species and management techniques.
- Integrate knowledge of forest growth and subsequent use on carbon dynamics at a European scale.
- Provide, in collaboration with partners, an integrated approach for valuing the ecosystem services afforded by urban trees, through development of the i-tree tool.
- Support training and continuing professional development programmes for the forestry sector through hosting targeted events with other partners such as the Institute of Chartered Foresters, and quantify and assist training opportunities in forestry research through doctoral training programmes, PhD and MSc studentships and secondments.
- Deliver the agreed annual business plan, programme outputs and secure a total of £4.8 million of income from non-Forestry Comission GB sources.
- Strengthen relationships and partnership working with the forestry sector across government, devolved administrations, international forestry research organisations and our partners in European forestry projects.
- Further develop Forest Research in Wales, working with the Welsh Government, Natural Resources in Wales, and new and existing customers and partners.
- Support and actively contribute to forest sector initiatives and national campaigns, such as 'Grown in Britain'.
- Continue to engage with business change initiatives within the Forestry Comission, Defra and the Devolved Administrations.

11. 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 2013–14 indicates that 98.5% were paid within the due date. Arrangements for handling complaints on payment performance are notified to suppliers on contracts.

12. Employment policies

Forest Research adheres to the Forestry Commission's employment policy and values and respects its staff by treating each member with respect and trust, and in doing so recognises that each person is different and can make a unique contribution to the work. The purpose of the employment policy is to demonstrate that Forest Research is an equal-opportunity employer and the aim is to be fair to everybody. To do this the Forestry Commission and Forest Research ensure that no eligible job applicant or employee receives less favourable treatment on the grounds of their gender or gender re-assignment, ethnic origin, disability, age, nationality, national origin, sexual orientation, marital status, religion and religious or philosophical belief, and social class.

All employees, whether part-time, full-time or temporary, will be treated fairly and equally. Selection for employment, promotion or training or any other benefit will be on the basis of aptitude and ability. All employees will be helped and

encouraged to develop their full potential and the talents and resources of the workforce will be fully utilised to maximise the efficiency of the organisation. No person shall be disadvantaged by conditions or requirements which cannot be shown to be justifiable.

The Forestry Commission and Forest Research also follow good employer practices aimed at ensuring that all staff work in an environment free from both illegal and unfair discrimination and harassment. Consolidated statements of the Commission's obligations with regard to equality of opportunity and diversity are shown in the Staff Handbook. Full details of these initiatives arising from our policies are also set out on the Human Resources intranet site.

The Forestry Commission and Forest Research will monitor the success of their policies by:

- collecting and analysing data as appropriate;
- regularly reviewing procedures (recruitment, performance management, promotion and pay) to ensure that they are free of unfair discrimination;
- reporting the results of equality and diversity monitoring to the Human Resources Management Sub-Committee on an annual basis;
- liaising closely with Cabinet Office and other Government Departments to ensure that we are keeping abreast of all changes in legislation and other developments.

Further information on the employment of persons with disabilities, the provision of information to, and consultation with, employees, and the promotion of equal opportunities is available on request from the Human Resources unit of the Forestry Commission.

13. Sickness absence

The Forestry Commission has one common 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 an internal employee support programme which is available 24 hours a day. The average number of working days lost to sickness absence in Forest Research in 2013–14 was 4.8 per employee (2012–13: 4.1), compared with the average of 5.7 (2012–13: 4.9) for the Forestry Commission. The Civil Service average for 2013 was 6.4 days per person.

14. Management

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

Owen Paterson MP	*Secretary of State*
Lord de Mauley	*Parliamentary Under-Secretary of State*
Dan Rogerson MP	*Parliamentary Under-Secretary of State (from October 2013)*
David Heath MP	*Minister of State for Agriculture and Food (until October 2013)*

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

James Pendlebury *	*Chief Executive*
Peter Freer-Smith *	*Chief Scientist*
Mike Cowan	*Human Resources Business Partner (from July 2013)*
Helen McKay	*Head of Centre for Sustainable Forestry and Climate Change*
Chris Quine	*Head of Centre for Ecosystems, Society and Biosecurity*
Sandra Smith	*Head of Finance (from July 2013)*
Hugh Williams	*Head of Centre for Research Services*

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 Commissioners' Recruitment Code.

Further details on remuneration are set out in the Remuneration Report (page 26).

* These Board Members have related party interests which are disclosed in Note 19.

15. Pensions

Information on pensions is contained in the Remuneration Report and accounting policy Note 1.6.

16. Personal-data-related incidents

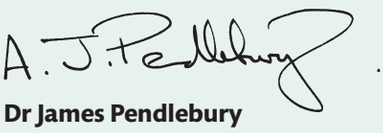
There were no protected personal-data-related incidents reported for Forest Research in 2013–14 or previous financial years. Forest Research will continue to monitor and assess its information risks in order to identify and address any weaknesses and ensure continued improvement of its systems. Further information on the handling of information risk is contained in the Governance Statement (page 31).

17. 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 £29,000 (2012–13: £31,000). No further non-audit services were provided in 2013–14 or 2012–13.

18. 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.



Dr James Pendlebury
Chief Executive and Accounting Officer
27 May 2014

Remuneration Report

Remuneration policy

Remuneration of 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 Great Britain/England. Other board members' remuneration is determined by the standard processes set out in the Forestry Commission's pay and grading system.

Employment contracts

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 Commissioners' Recruitment Code. Dr James Pendlebury was appointed as Chief Executive with effect from 16 June 2008. His notice period is one week for each year's service up to a maximum of 13 weeks; currently this is 12 weeks (due to prior employment within the Forestry Commission).

Civil Service appointments are made in accordance with the Civil Service Commissioners' Recruitment Code, which requires appointment to be on merit on the basis of fair and open competition but also includes the circumstances when appointments may otherwise be made. All senior staff covered in this report hold appointments which are open-ended until they reach the normal retiring age. Peter Freer-Smith's notice period is 13 weeks, and for other senior staff it is three months. Early termination, other than for misconduct, would result in the individual receiving compensation as set out in the Civil Service Compensation Scheme.

The performance of senior staff is monitored and reviewed through the appropriate Performance Management System (PMS) of the Forestry Commission. No element of remuneration is specifically subject to performance conditions, although pay progression can be affected and bonuses, if awarded, are based on performance. Further information about the work of the Civil Service Commissioners can be found at **http://civilservicecommission.independent.gov.uk**

The following information is subject to audit.

Remuneration (salary, benefits in kind and pensions)

The salary (includes basic salary, overtime and any allowances subject to UK taxation) and pension entitlements of the members of the Forest Research Executive Board were as follows.

Name	2013–14				2012–13			
	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	70–75	3,000	12	85–90	70–75	1,900	13	85–90
Peter Freer-Smith	70–75	8,100	11	90–95	70–75	8,200	4	80–85
Mike Cowan~	20-25 25-30	– –	17 –	35–40 –	–	–	–	–
Andy Moffat #	–	–	–	–	150–155	-	28	180–185
Helen McKay	65–70	–	(1)	60–65	65–70	–	5	70–75
Chris Quine	65–70	–	(30)	35–40	65–70	–	24	85–90
Sandra Smith ~	40–45 50–55	– –	(7) –	30–35 –	–	–	–	–
Hugh Williams	55–60	–	15	70–75	55–60	–	19	70–75

* 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.

~ Mike Cowan and Sandra Smith became Executive Board members in July 2013. Mike works 60% for Forest Research. The lower figures for these staff relate to period 1 July 2013 to 31 March 2014, whilst higher ones are equivalent for full year.

Andy Moffat left on 30 March 2013 under Voluntary Exit terms: he received a compensation payment of £85,000 – £90,000. His basic full-time salary banding was £65,000 – £70,000.

No bonuses were payable in either 2013–14 or 2012–13.

Benefits in kind

The monetary value of benefits in kind covers any benefits provided by the employer and treated by the HM Revenue and Customs as taxable income. They are in respect of the Car Provision for Employees Scheme.

Highest-paid director and median salary cost disclosure

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 2013–14 was £70,000 – £75,000 (2012–13: £150,000 – £155,000). This was 2.53 times (2012–13: 5.01) the median remuneration of the workforce, which was £28,645 (2012–13: £30,464). In 2013–14 no employees (2012–13: nil) received remuneration in excess of the highest-paid director. The 2012–13 comparative is much higher as the highest paid director received a severance payment of £85,000 – £90,000 in addition to salary of £65,000 – £70,000.

Total remuneration includes salary and benefits in kind as well as severance payments. It does not include employer pension contributions and the cash equivalent transfer value of pensions.

Remuneration of non-executives

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

Name	2013–14 £000	2012–13 £000
Victoria M. Edwards	1	1
David A. Evans	1	1
Judith Webb	1	1

Pension benefits 2013–14

Name	Accrued pension at age 60 at 31/3/14 and related lump sum (LS) £000	Real increase (decrease) in pension and related lump sum (LS) £000	CETV at 31 March 2014 £000	CETV at 31 March 2013* £000	Real increase (decrease) in CETV £000
James Pendlebury	10–15 plus 35–40 LS	0–2.5 plus 0–2.5 LS	227	201	9
Peter Freer-Smith	25–30 plus 85–90 LS	0–2.5 plus 0–2.5 LS	623	575	10
Mike Cowan ~	5–10 plus Nil LS	0–2.5 plus Nil LS	51	35~	11
Helen McKay	25–30 plus 85–90 LS	0–2.5 plus 0–2.5 LS	686	643	(1)
Chris Quine	25–30 plus 80–85 LS	(0–2.5) plus (2.5–5) LS	519	512	(26)
Sandra Smith ~	40–45 plus Nil LS	(0–2.5) plus Nil LS	655	622~	(5)
Hugh Williams	15–20 plus 10–15 LS	0–2.5 plus (0–2.5) LS	236	209	7

* 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.

~ Mike Cowan and Sandra Smith became Executive Board members in July 2013. The figures for CETV at 31 March 2013 for these two staff are as at 30 June 2013.

Civil Service pensions

Pension benefits are provided through the Civil Service pension arrangements. From 30 July 2007, civil servants may be in one of four defined benefit schemes: either a 'final salary' scheme (classic, premium or classic plus), or a 'whole career' scheme (nuvos). 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 and nuvos are increased annually in line with Pensions Increase legislation. Members joining from October 2002 may opt for the appropriate defined benefit arrangement or a good-quality 'money purchase' stakeholder arrangement with a significant employer contribution (partnership pension account).

Employee contributions are salary-related and range between 1.5% and 6.25% of pensionable earnings for classic and 3.5% and 8.25% for premium, classic plus and nuvos. Increases to employee contributions will apply from 1 April 2014. 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 their 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. 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 3% and 12.5% (depending on the age of the member) into a stakeholder pension product chosen by the employee from a panel of three 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 0.8% 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 and classic plus and 65 for members of nuvos.

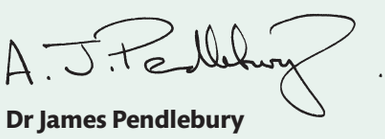
Further details about the Civil Service pension arrangements can be found at the website **http://www.civilservice.gov.uk/pensions.**

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 individual 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 (decrease) in CETV

This reflects the increase (decrease) in CETV effectively funded by the employer. It does not include the increase (decrease) 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.



Dr James Pendlebury
Chief Executive and Accounting Officer
27 May 2014

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 General of the Forestry Commission, in his then role as Accounting Officer for the Forestry Commission, designated the Chief Executive of Forest Research as the Accounting Officer for Forest Research and this continues under the Director Forestry Commission England, in his role as the current Additional Accounting Officer for the Forestry Commission. His 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.

Governance Statement

1. 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.

2. 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.

The system of internal control is a significant part of that framework and is designed to manage risk to a reasonable level. 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 for the year ended 31 March 2014 and up to the date of approval of the Annual Report and Accounts, and complies with HM Treasury guidance.

3. 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 monthly, with the exception of August. The Board discussed a wide range of forest research and related issues, including:

- future science;
- Research Strategy Management Board;
- communications;
- Woodland Policy Enabling Programme;
- Science and Innovation Strategy;
- Corporate Plan Key Actions;
- health and safety;
- staff survey;
- business development, including external income;
- risk register.

At each meeting, the Board also discussed the Finance and Human Resources reports and received verbal updates on Forestry-Commission-wide Governance meetings. They also reviewed Centre reports on Sustainable Forestry and Climate

Change, Ecosystems, Society and Biosecurity and Research Services. There were ten FREB meetings during 2013–14 and attendance was as follows:

Name	Meetings attended
James Pendlebury	10
Peter Freer-Smith	10
Mike Cowan ~	5
Helen McKay	9
Chris Quine	10
Sandra Smith ~	7
Hugh Williams	9

~ Only eligible to attend seven as FREB members.

Audit and Risk Assurance Committee

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

During the year, the Committee met on three occasions and discussed a wide range of issues including:

- risk management;
- annual report and accounts 2012–13;
- external and internal audit strategy and reports;
- information security;
- governance statement.

There were three Audit and Risk Assurance Committee meetings during 2013–14 and attendance was as follows:

Name	
Victoria M. Edwards	3
David A. Evans	3
Judith Webb	2

4. 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 Annual Assurance Statements from the each of the Heads of Shared Services for the Forestry Commission, based centrally in Edinburgh, providing me with assurance on the standard of governance and control within their area of responsibility.

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 substantial assurance that material risks to the achievement of objectives are adequately managed. Forest Research applies the principles of HM Treasury's Code of Practice for Corporate Governance in the context of its own circumstances, where relevant and practical.

The Audit and Risk Assurance Committee reviews its effectiveness in line with best practice as set out in HM Treasury's Audit Committee Handbook.

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

5. Risk management

The Forest Research Executive Board 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 on-going management review.

The Executive Board ensures that the risk management policy is implemented and that they strategically review 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 Audit and Risk Assurance Committee (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 3 above).

During 2013–14 Forest Research commenced a comprehensive review of the risk register to ensure that it accurately reflects risks and relevant responses in a changing environment. The review will be finalised in 2014–15.

6. Ministerial direction

No ministerial directions were given during the year.

7. Significant risk and governance issues

Tree Health

Forest Research needs to maintain effective relationships to respond to new and unforeseen tree health disease outbreaks or other issues. The recent Chalara outbreak has ensured that Forest Research is very well networked with a range of other institutes and research providers (e.g. Fera, Rothamsted Research, James Hutton Institute) to ensure an effective response capability. This is in line with the expected proposals of the ongoing GO-Science/Defra Animal and Plant Health in the UK: Assessment of Future National Capability.

Information Communication Technology (ICT) infrastructure

The Audit and Risk Assurance Committee had a presentation and detailed discussion on this topic at their March meeting. The ICT infrastructure modernisation programme continues with further migration of key business applications to the new platform. Step by step this programme is making positive inroads into the business risk posed by ICT infrastructure failure. The disaster recovery site at Northern Research Station is now operational and has capacity to restore major corporate systems within five working days.

Forest Research is dependent on the Forestry Commission's ICT infrastructure. However, whilst some risk to the business operations of the Agency 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 2014–15 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. Work has continued on Business Continuity within shared services. During the year all services completed Business Impact Assessments and a draft Business Continuity policy was agreed. Further refinements are being made with the aim of publishing the final policy and Business Continuity Plans being available for all shared services by September 2014.

Information risk management

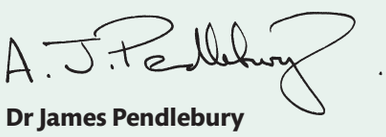
Forest Research shares a common approach to information risk management with the Forestry Commission. The Forestry Commission continues to take a proportionate approach to information risk. Forest Research does not have as much sensitive information as most other departments and our information holdings 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 Officer (SIRO) for Forest Research and participates in the meetings of the Forestry Commission's Information Security Management Forum (ISMF), chaired by the Forestry Commission's Director of Finance Great Britain. The ISMF coordinates and controls the implementation of information security for the Forestry Commission. The ISMF is supported through the Forestry Commission's Departmental Security Officer, who reports back to the ISMF, and the IT Security Officer. The Departmental Security Officer provides regular reports and updates to the ISMF on security matters. Forest Research's SIRO sits on and provides information to the Forest Research Executive Board and provides updates to the Forest Research Audit and Risk Assurance Committee.

Three levels of 'Government Security Classification' and 'Responsible for Information' training are now online and will be undertaken by all staff at the appropriate level for their role.

There was one lapse of data security reported during 2013–14. In April 2013, a box of backup tapes was removed from a fireproof safe which was being transferred between buildings and the box was inadvertently left behind. The tapes were recovered with no loss of data.

We propose over the coming year to take steps to address the above matters to further enhance our governance arrangements. We are satisfied that these steps will address the need for improvements that were identified in our review of effectiveness and we will monitor their implementation and operation as part of our next annual review.



Dr James Pendlebury
Chief Executive and Accounting Officer
27 May 2014

The 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 2014 under the Government Resources and Accounts Act 2000. The financial statements comprise: the Statements of Comprehensive Income, 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 Report that is described in that report 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 Strategic Report and the Directors' 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 2014 and of the net operating income 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 Report 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 Strategic Report and the Directors' 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 Report 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.

Amyas C E Morse
Comptroller and Auditor General
2 June 2014

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

Statement of Comprehensive Income for the year ended 31 March 2014

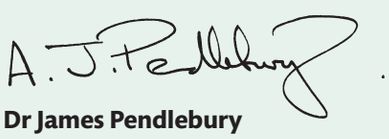
	Notes	2013–14 £000	2012–13 £000
Income			
Forestry Commission customers	3	**10,492**	11,304
Non-Forestry Commission customers			
European Union		**531**	486
Other	3b	**2,547**	1,838
Total income		**13,570**	13,628
Expenditure			
Staff costs	4	**7,684**	7,677
Other management costs	5	**2,963**	2,631
Materials and services	6	**2,605**	2,390
Total expenditure		**13,252**	12,698
Net operating income		**(318)**	(930)
Other comprehensive net (income) expenditure			
Net gain on revaluation of property, plant and equipment		**106**	655
Net (loss)/gain on revaluation of intangible assets		**(1)**	6
		105	661
Total comprehensive expenditure for the year		**(423)**	(1,591)

All income and expenditure are derived from continuing operations.

The notes on pages 41 to 59 form part of these accounts.

Statement of Financial Position as at 31 March 2014

	Notes	31 March 2014 £000	31 March 2013 £000
Non-current assets			
Property, plant and equipment	7	**10,598**	10,809
Intangible assets		**44**	41
Financial assets	8	**25**	25
		10,667	10,875
Current assets			
Inventories		**2**	2
Trade and other receivables	9	**1,603**	1,222
Cash and cash equivalents	10	**255**	259
		1,860	1,483
Total assets		**12,527**	12,358
Current liabilities			
Provisions	12	**(88)**	(291)
Trade and other payables	11	**(2,165)**	(2,118)
		(2,253)	(2,409)
Net assets		**10,274**	9,949
Non-current liabilities			
Provisions	12	**(360)**	(212)
Assets less liabilities		**9,914**	9,737
Taxpayers' equity			
General Fund		**3,234**	3,149
Revaluation Reserve		**6,680**	6,588
		9,914	9,737



Dr James Pendlebury
Chief Executive and Accounting Officer
27 May 2014

The notes on pages 41 to 59 form part of these accounts.

Statement of Cash Flows for the year ended 31 March 2014

		2013–14	2012–13
	Notes	**£000**	£000
Net cash inflow from operating activities			
Net operating income		**318**	930
Adjustments for non-cash transactions			
Depreciation	5	**636**	580
Amortisation	5	**12**	15
Timing between accrual and cash VAT		**-**	(1)
Non-cash inter-country transfers		**99**	(88)
Impairment of property, plant and equipment	5	**-**	50
Loss on disposal of property, plant and equipment	5	**12**	115
Notional audit fee		**29**	31
Movements in provisions	12	**56**	(52)
Decrease/(increase) in inventories		**-**	1
Decrease/(increase) in trade and other receivables	9	**(381)**	234
(Decrease)/increase in trade and other payables	11	**47**	(246)
Movements in payables relating to items not passing through the SCI		**-**	(149)
Use of provisions	12	**(111)**	(716)
Net cash inflow from operating activities		**717**	704
Cash flows from investing activities			
Purchase of property, plant and equipment	7	**(330)**	(199)
Purchase of intangible assets		**(16)**	(12)
Net cash outflow from investing activities		**(346)**	(211)
Cash flows from financing activities			
Net cash transfer to the Forestry Commission		**(375)**	(238)
Net financing		**(375)**	(238)
Net increase/(decrease) in cash and cash equivalents in the period		**(4)**	255
Cash and cash equivalents at the beginning of the period		**259**	4
Cash and cash equivalents at the end of the period		**255**	259

The notes on pages 41 to 59 form part of these accounts.

Statement of Changes in Taxpayers' Equity for the year ended 31 March 2014

	General Fund	Revaluation Reserve	Total Reserves
	£000	£000	£000
Balance at 1 April 2013	**3,149**	**6,588**	**9,737**
Changes in taxpayers' equity for 2013–14			
Net gain/(loss) on revaluation of property, plant and equipment	**-**	**106**	**106**
Net gain/(loss) on revaluation of intangible assets	**-**	**-**	**-**
Non-cash charges: inter-country transfers	**99**	**-**	**99**
Realised element of the Revaluation Reserve	**14**	**(14)**	**-**
Notional audit fee	**29**	**-**	**29**
Net operating income	**318**	**-**	**318**
Cash surplus transferred to Forestry Commission	**(375)**	**-**	**(375)**
Balance at 31 March 2014	**3,234**	**6,680**	**9,914**
Balance at 1 April 2012	**2,395**	**6,047**	**8,442**
Changes in taxpayers' equity for 2012–13			
Net gain/(loss) on revaluation of property, plant and equipment	-	655	655
Net gain/(loss) on revaluation of intangible assets	-	6	6
Non-cash charges: timing between accrual and cash VAT	(1)	-	(1)
Non-cash charges: inter-country transfers	(88)	-	(88)
Realised element of the Revaluation Reserve	120	(120)	-
Notional audit fee	31	-	31
Net operating income	930	-	930
Cash surplus transferred to Forestry Commission	(238)	-	(238)
Balance at 31 March 2013	**3,149**	**6,588**	**9,737**

The notes on pages 41 to 59 form part of these accounts.

Notes to the Accounts

Note 1. Statement of Accounting Policies

These financial statements have been prepared in accordance with the 2013–14 *Government Financial Reporting Manual* (FReM) issued by HM Treasury. The accounting policies contained in the FReM apply International Financial Reporting Standards (IFRS) as adapted or interpreted for the public-sector context. Where the FReM permits a choice of accounting policy, the accounting policy 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. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the financial statements are disclosed in Note 2.

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, inventories and available-for-sale financial assets, and derivative financial assets and derivative financial liabilities at fair value through profit or loss.

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 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.

1.4 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 and it is probable that future economic benefits will flow to it.

1.5 Foreign currency translation

(a) 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.

(b) 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.

1.6 Employee benefits

Pensions

Past and present employees are covered by the provisions of the Principal Civil Service Pension Scheme (PCSPS). The defined benefit schemes are unfunded and are non-contributory except in respect of dependant's benefits. Forest Research accounts for the PCSPS scheme 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.

1.7 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. Staff payroll costs and expenditure on materials and consumables related to systems development software, for general use within Forest Research, are recognised as tangible non-current assets. There was no relevant in-house development activity in the year 2013–14.

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

Non-forest land

Non-forest land is shown at fair value. Professionally qualified staff employed by the Forestry Commission undertake a full revaluation of non-forest land at five-yearly intervals. They follow the principles set out in the RICS Red Book and value on the basis of Open Market Value, Existing Use Value, Depreciated Replacement Cost or Discounted Cash Flow, as appropriate under the RICS Standards for determining fair value. The work of internal staff is reviewed by Smiths Gore, Chartered Surveyors.

Unequipped agricultural land indices provided by the District Valuer are used to restate values between full valuations. A full valuation took place on 31 March 2013.

Revaluation gains and losses are recognised in the Statement of Comprehensive Income in the year of revaluation.

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 Open Market Value, Existing Use Value, Depreciated Replacement Cost or Discounted Cash Flow, as appropriate under the RICS Standards 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 Smith Gore, Chartered Surveyors, reviewed this.

In the intervening years between professional valuations, indices provided by the District Valuer are used to restate values. Indexation was applied as at 31 March 2014.

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.

Information technology hardware

Information technology (IT) hardware is shown at fair value less accumulated depreciation. IT values are restated to current value each year using indices provided by the Office for National Statistics.

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.

1.8 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
- information technology – hardware – over 5 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.

1.9 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 their estimated useful lives of 5 to 15 years.

1.10 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.

1.11 Financial assets

Classification

Forest Research classifies its financial assets in the following categories: at fair value through profit or loss and loans and receivables. 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.

1.12 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.

1.13 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.

1.14 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.

1.15 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.

Note 2. Critical Accounting Estimates and Judgements

The preparation of financial statements requires Forest Research to make estimates, assumptions and judgements. These are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. 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.

Note 3. Income

3a 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. A separate annual charge is agreed for each project based on full cost recovery. These charges amounted to £7.7 million. In addition to the annual research programme, Forest Research provides other research and survey services for the Forestry Commission (GB, England and Scotland) the majority of which is on a full cost-recovery basis.

Income from Forestry Commission customers consisted of:

	2013–14	2012–13
	£000	£000
Research, development and other services to:		
Corporate Forestry Support	**7,971**	8,576
Inventory, Forecasting and Operational Support	**833**	812
England	**809**	874
Scotland	**879**	793
Wales *	**-**	249
	10,492	11,304

* Forestry Commission Wales became part of Natural Resources Wales with effect from 1 April 2013 and income is accounted for as other income (see Note 3b).

3b Other income

The increase in other income is largely as a result of the Agency being successful in winning more external contracts, one of the aims to compensate for reduced income from the Forestry Commission. Other income consisted of:

	2013–14	2012–13
	£000	£000
Contracts for research and services *	**2,321**	1,512
Consultancy	**-**	51
Ad hoc – sample analysis, supply of seeds, conferences, advisory, reimbursement of expenses	**226**	275
	2,547	1,838

* Includes income of £237,000 from Natural Resources Wales in 2013–14.

Note 4. Staff Costs and Numbers

4a Employee costs during the year amounted to:

	Permanent staff £000	**Other staff £000**	**2013–14 Total £000**	2012–13 £000
Wages and salaries	**5,519**	**543**	**6,062**	6,058
Social security costs	**444**	**37**	**481**	498
Employer's superannuation costs	**1,024**	**83**	**1,107**	1,116
Agency staff costs	**-**	**23**	**23**	5
Seconded staff costs	**-**	**11**	**11**	-
	6,987	**697**	**7,684**	7,677

Average number of employees (full-time equivalents)	**2013–14**	2012–13
Permanent staff – male	**107**	113
Permanent staff – female	**53**	53
Total permanent	**160**	166
Others – male	**11**	7
Others – female	**12**	5
Total others	**23**	12
Total staff	**183**	178

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 2007. Details can be found in the resource accounts of the Cabinet Office: Civil Superannuation (www.civilservice.gov.uk/pensions).

For 2013–14, employer's contributions of £1,113,005 were payable to the PCSPS (2012–13: £1,109,924) at one of four rates in the range 16.7% to 24.3% 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 2013–14 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 £4,963 (2012–13: £5,108) were paid to one or more of a panel of three appointed stakeholder pension providers. Employer contributions are age-related and range from 3% to 12.5% of pensionable pay. Employers also match employee contributions up to 3% of pensionable pay. In addition, employer contributions of £362 (2012–13: £355), 0.8% of pensionable pay, 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 (SFP) date were £nil. Contributions prepaid at that date were £nil.

All salary-related costs for senior staff are disclosed in the Remuneration Report on page 26.

4b Benefits in kind are provided under the following schemes:

(i) advances of salary for house purchase;
(ii) advances of salary for purchase of season tickets and bicycles;
(iii) car provision for employees scheme.

Each scheme is subject to conditions and financial limits.

The Advances of Salary for House Purchase scheme had loans with an outstanding balance of £2,500 or more to one individual member of staff at 31 March 2014 but none as at 31 March 2013. The total outstanding value of all loans was £21,000 (2012–13: £nil). Such loans are unsecured, interest free and typically repayable over 10 years.

4c Early departure costs

During 2013–14, one non-senior staff member left under Compulsory Redundancy terms. They received a compensation payment of £8,053. During 2012–13, 13 non-senior staff members left under Voluntary Exit and Voluntary Redundancy terms.

Exit package cost band	Number of compulsory redundancies		Number of other departures agreed		Total number of exit packages by cost band	
	2013–14	2012–13	**2013–14**	2012–13	**2013–14**	2012–13
Less than £10,000	1	nil	nil	3	1	3
£10,000 – £25,000	nil	nil	nil	3	nil	3
£25,000 – £50,000	nil	nil	nil	5	nil	5
£50,000 – £100,000	nil	nil	nil	1	nil	1
£100,000 – £150,000	nil	nil	nil	1	nil	1
£150,000 – £200,000	nil	nil	nil	nil	nil	nil
Total number of exit packages	1	nil	nil	13	1	13
Total resource cost £	**£8,053**	**nil**	**nil**	**£424,021**	**£8,053**	**£424,021**

Redundancy and other departure costs have been paid in accordance with the provisions of the Civil Service Compensation Scheme, a statutory scheme made under the Superannuation Act 1972. Exit costs are accounted for in full in the year of departure. Where the department has agreed early retirements, the additional costs are met by the Forestry Commission through additional resources allocated by Defra and not by the Principal Civil Service Pension Scheme. Costs relating to the one senior member of staff who left Forest Research under Voluntary Exit and Voluntary Redundancy terms in 2012–13 are included in the Remuneration Report (page 26). No senior staff left Forest Research under these terms in 2013–14. Ill-health retirement costs are met by the pension scheme and are not included in the table.

Note 5. Other Management Costs

	Notes	**2013–14** **£000**	2012–13 £000
Travel and subsistence		**516**	491
Building maintenance		**1,083**	705
Utilities *		**232**	265
Training		**118**	81
Early departure costs paid in year		**-**	23
Other expenditure		**165**	267
Computer supplies		**64**	44
Staff transfer expenses		**13**	15
Non-cash costs:			
Provisions – early departure costs:			
Provided in year	12	**8**	14
Unwinding of discount	12	**8**	25
Provisions – EU reclaim		**-**	(91)
Provisions – untaken time off in lieu	12	**67**	-
Depreciation of property, plant and equipment	7	**636**	580
Amortisation of intangible assets		**12**	15
Impairment of property, plant and equipment		**-**	50
Loss on disposal of property, plant and equipment	7	**12**	115
Loss on disposal of intangible assets		**-**	1
Auditors' remuneration – notional cost		**29**	31
Total		**2,963**	2,631

* The photovoltaic panels at Alice Holt generated 24,702 kWh (2012–13: 23,164 kWh) of electricity.

Included within other management costs are charges from the Forestry Commission amounting in total to £77,000 (2012–13: £83,000).

Note 6. Materials and Services

	2013–14	2012–13
	£000	£000
Materials and supplies	**725**	684
Central services provided by Forestry Commission *	**716**	816
Vehicle lease charges from Forestry Commission *	**307**	302
Contractors ~	**632**	343
Commissioned research	**86**	174
Protective clothing	**13**	13
Miscellaneous expenditure	**126**	58
	2,605	2,390

* 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 Forestry Commission was £1,022,000 (2012–13: £1,118,000).

~ The level of spend on contractors is partially determined by the nature of the research work that Forest Research undertakes; higher expenditure indicates more contractors being used to deliver the contracts.

Note 7. Tangible Non-Current Assets

	Freehold land	Buildings	Scientific equipment	IT equipment	Other machinery and equipment	Assets under construction	Total
	£000	£000	£000	£000	£000	£000	£000
Valuation							
At 1 April 2013	1,862	12,822	2,108	51	1,020	-	17,863
Additions	-	-	228	-	-	103	331
Disposals	-	(56)	(197)	(26)	(62)	-	(341)
Revaluation to current prices	51	152	31	(1)	-	-	233
At 31 March 2014	**1,913**	**12,918**	**2,170**	**24**	**958**	**103**	**18,086**
Depreciation:							
At 1 April 2013	-	5,583	960	42	469	-	7,054
Provided in year	-	359	198	6	73	-	636
Disposals	-	(49)	(192)	(27)	(62)	-	(330)
Revaluation to current prices	-	115	14	(1)	-	-	128
At 31 March 2014	**-**	**6,008**	**980**	**20**	**480**	**-**	**7,488**
Net book value:							
At 31 March 2014	**1,913**	**6,910**	**1,190**	**4**	**478**	**103**	**10,598**
At 31 March 2013	1,862	7,239	1,148	9	551	-	10,809
Valuation							
At 1 April 2012	1,717	13,216	1,991	152	977	-	18,053
Additions	-	24	290	-	36	-	350
Disposals	-	(289)	(155)	(107)	(46)	-	(597)
Revaluation to current prices	145	-	(18)	6	53	-	186
Impairment	-	(129)	-	-	-	-	(129)
At 31 March 2013	1,862	12,822	2,108	51	1,020	-	17,863
Depreciation:							
At 1 April 2012	-	6,042	931	125	406	-	7,504
Provided in year	-	288	192	20	81	-	581
Disposals	-	(182)	(155)	(107)	(38)	-	(482)
Revaluation to current prices	-	(486)	(7)	4	20	-	(469)
Impairment	-	(79)	-	-	-	-	(79)
At 31 March 2013	-	5,583	960	42	469	-	7,054
Net book value:							
At 31 March 2013	1,862	7,239	1,148	9	551	-	10,809
At 31 March 2012	1,717	7,174	1,060	27	571	-	10,549

Fixed assets were revalued as at 31 March 2014 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 £4.2 million and £2.5 million, respectively, at 31 March 2014.

Depreciation expenses of £636,000 (2012–13: £580,000) have been charged to other management costs in the Statement of Comprehensive Income.

In 2013–14 Forest Research incurred £349,000 replacing windows in the science block at Alice Holt. This cost has been accounted for as expenditure (building maintenance in Note 5) rather than capital additions, as our professional valuers (Smiths Gore) have confirmed the value of the building is not affected as the new windows are a like-for-like replacement.

Note 8. Investments

The investment in C-Cure Solutions Ltd is stated at historic costs less impairment. At 31 March 2014 the value was £25,000 (2012–13: £25,000).

C-Cure Solutions Ltd is a spin-out company launched with the University of Surrey during 2009–10, in the area of land remediation. In the period March 2011 to March 2013 Genomia Management Ltd invested £305,000 for 361 shares of the company. The current shareholdings are: Forest Research 24.99%, the University of Surrey 24.98%, the inventors 22.71% and Genomia 27.32%.

C-Cure Solutions Ltd has its registered office at Chancery House, 30 St Johns Road, Woking, Surrey GU21 7SA.

James Pendlebury represents Forest Research as a Director of the Company, for which he receives no personal payments.

In the year ended 31 March 2014, C-Cure Solutions Ltd had a turnover of £65,000 and an expenditure of £137,000, resulting in an operating loss of £72,000. In the year ended 31 March 2013, C-Cure Solutions Ltd had a turnover of £7,000 and an expenditure of £90,000, resulting in an operating loss of £83,000.

Note 9. Receivables

9a Analysis by type

	2013–14	2012–13
	£000	£000
Current		
EU trade receivables	**328**	253
Other trade receivables	**631**	400
Total trade receivables	**959**	653
VAT	**3**	-
House purchase loans to employees	**21**	-
Prepayments and accrued income	**620**	569
Total current receivables	**1,603**	1,222

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

As of 31 March 2014, £537,000 (2012–13: £499,000) were fully performing and not overdue or impaired and provided for.

As of 31 March 2014, trade receivables of £422,000 (2012–13: £168,000) were overdue but not impaired. These relate to a number of customers for whom there is no recent history of default. The age analysis of these trade receivables is as follows:

	2013–14	2012–13
	£000	£000
Months overdue		
Less than one month	**136**	53
One to two months	**0**	1
Two to three months	**61**	40
More than three months	**225**	74
	422	168

As of 31 March 2014, trade receivables of £nil (2012–13: £nil) were impaired or provided for.

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:

	2013–14 £000	2012–13 £000
Current		
UK Pound	**1,198**	817
Euro	**405**	405
	1,603	1,222

9b Intra-government balances

	2013–14 £000	2012–13 £000
Current		
Balances with other central government bodies	**604**	124
Balances with local authorities	**3**	43
Intra-government balances	**607**	167
Balances with bodies external to government	**996**	1,055
	1,603	1,222

Note 10. Cash and Cash Equivalents

The following balances at 31 March are held at commercial banks and as cash in hand:

	2013–14 £000	2012–13 £000
Opening balance at 1 April	**259**	4
Net change in balances	**(4)**	255
Balance at 31 March	**255**	259

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

As part of its normal activities Forest Research maintains Sterling and Euro bank accounts primarily used for the receipt of income from non-Forestry-Commission customers. These accounts are cleared to the Commission's main account on a regular basis. Sums held in these accounts on behalf of partners in European Commission projects are treated as third-party assets and not included in the balances shown.

Note 11. Trade and Other Payables

	2013–14	2012–13
	£000	£000
Current		
Payments received on account	**931**	475
Trade payables	**471**	440
Taxation and social security costs	**83**	97
Accrued expenses and deferred income *	**680**	1,106
	2,165	2,118

* 2012–13: £410,000 of this sum relates to Early Departure Costs payable to staff who left on 30 March, but not paid until April the following year.

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

All payables are to bodies external to central or local government as at 31 March 2014 and 31 March 2013, with the exception of Taxation and social security costs and £7,000 due to central government and £1,000 due to local authorities as at 31 March 2013. Funds held on behalf of partners in European Commission projects are treated as third-party assets (see Note 20). At 31 March 2014 the amount held in Forest Research bank accounts on behalf of partners was £299,000 (31 March 2013: £181,000).

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

	2013–14	2012–13
	£000	£000
Current		
UK Pound	**1,428**	1,848
Euro	**737**	259
US Dollar	**-**	11
	2,165	2,118

Note 12. Provisions for Liabilities and Charges

	2013–14		2012–13	
	Other	**Early departure costs**	EU	Early departure costs
	£000	**£000**	£000	£000
Balance brought forward at 1 April	**-**	**503**	127	1,144
Provided in year	**67**	**8**	-	14
Provision not required written back	**-**	**(26)**	(91)	-
Utilised in year	**-**	**(111)**	(36)	(680)
Unwinding of discount	**-**	**7**	-	25
Balance carried forward at 31 March	**67**	**381**	-	503

Analysis of expected timing of discounted cash flows:

	Other	**Early departure costs**
	£000	**£000**
Less than one year	**-**	**88**
Later than one year but not later than five years	**67**	**293**
More than five years	**-**	**-**
Balance at 31 March 2014	**67**	**381**

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.

Note 13. Financial Instruments

13.1 Financial Instruments by category

All financial assets on the Statement of Financial Position are loans and receivables, except for £25,000 (31 March 2013: £25,000) which is classified as available for sale. 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.

13.2 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 EU funding for contracts which are denominated in Euros and US Dollars.

EU contract income denominated in Euros and US Dollars forms only 4% of Forest Research's total income. Therefore, fluctuations in exchange rates do not have a significant impact on Forest Research.

Note 14. Capital Commitments

There were £152,000 contracted capital commitments as at 31 March 2014 (2012–13: £nil).

Note 15. 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:

	2013–14 £000	2012–13 £000
Land:		
Not later than one year	**2**	2
Later than one year and not later than five years	**5**	7
Total	**7**	9
Buildings:		
Not later than one year	**1**	1
Later than one year and not later than five years	**4**	5
Total	**5**	6
Equipment:		
Not later than one year	**5**	8
Later than one year and not later than five years	**-**	5
Total	**5**	13

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

	2013–14 £000	2012–13 £000
Not later than one year	**5**	5
Later than one year and not later than five years	**20**	20
Later than five years	**93**	98
Total	**118**	123

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 16. Other Financial Commitments

There were no other financial commitments at 31 March 2014 (2012–13: £nil).

Note 17. Contingent Liabilities Disclosed Under IAS 37

There were no contingent liabilities at 31 March 2014 (2012–13: £nil).

Note 18. Losses and Special Payments

There were no losses or special payments in either 2013–14 or 2012–13.

Note 19. 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 with the Department for Environment, Food and Rural Affairs, who are regarded as related parties. In addition, Forest Research has had operational transactions with other Government Departments and other central Government bodies.

19a **Purchases of goods and services:**

	2013–14 £000	2012–13 £000
The University of Southampton	**1**	1
Total	**1**	1

The above transactions, for course fees, student stipends and samples, 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 were no outstanding balances at 31 March 2014 (2012–13: £nil).

19b Transactions with C-Cure Solutions Ltd

	2013–14	2012–13
	£000	£000
C-Cure Solutions Ltd	**11**	6

The above relates to charges to C-Cure in respect of accommodation used at Alice Holt and water samples undertaken in the Forest Research laboratories. There was an outstanding balance of £2,186 at 31 March 2014 (2012–13: £435). This is disclosed as under the Agreement to form the company, James Pendlebury was appointed as the Forest Research Director of the company.

Note 20. 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.

	2012–13	**Gross inflows**	**Gross outflows**	**2013–14**
	£000	**£000**	**£000**	**£000**
Monetary third-party assets – Government Banking Service balances	30	898	(744)	**184**
Monetary third-party assets – Commercial bank balances	151	909	(945)	**115**

Note 21. 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 the reporting period are considered up to the date on which the accounts are authorised for issue. This is interpreted as the date of the Certificate and report of the Comptroller and Auditor General.

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