

# Forest Research

Annual Report and Accounts | 2004–2005



**Forest Research**

The research agency of the Forestry Commission

# Forest Research

Annual Report and Accounts | 2004–2005

Together with the Comptroller and Auditor General's Report on the Accounts

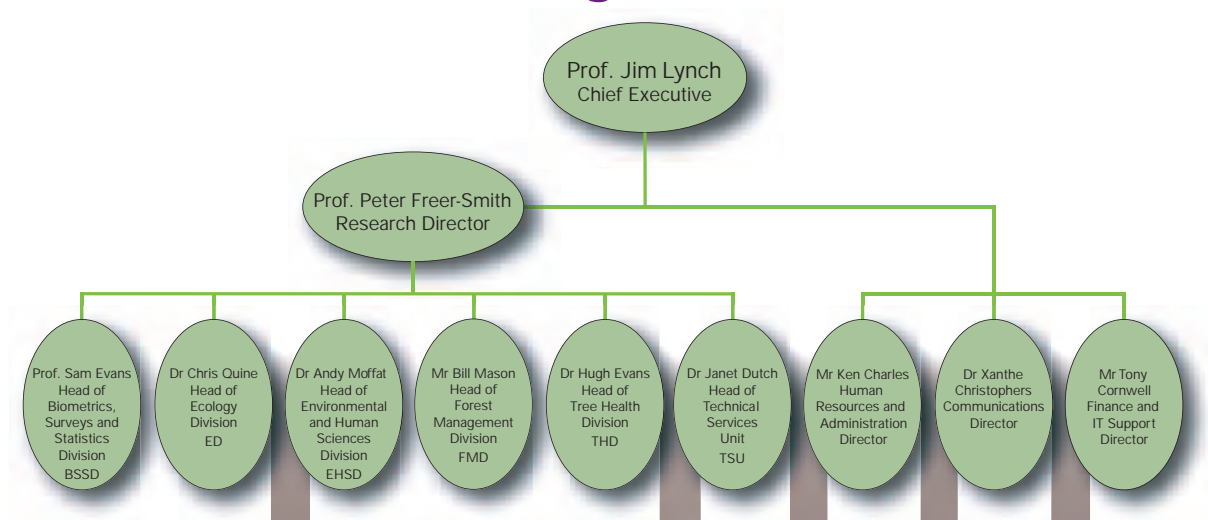
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## Forest Research Organisation 2005



Cover photo: Glistening ink cap (*Coprinus micaceus*) amongst beech and ivy leaves in woodland, Selborne, Hants.

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# About Forest Research

Forest Research is an agency of the Forestry Commission and is the leading UK organisation engaged in forestry and tree related research.

## Aims and objectives

The aims and objectives of Forest Research (FR) are to assist the Forestry Commission (FC) in achieving its high-level objective.

On behalf of all three administrations, to take the lead in development and promotion of sustainable forest management and to support its achievement internationally.

## FR's Aims

To support and enhance forestry and its role in sustainable development, by providing high-quality research and development in a well-run organisation.

## FR's Objectives

- To inform and support forestry's contribution to the development and delivery of the policies of the UK government and the devolved administrations.
- To provide research, development and monitoring services relevant to UK forestry interests.
- To transfer knowledge actively and appropriately.

## 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 forestry in Britain, including the particular needs of England, Scotland and Wales. Forest Enterprise was responsible for managing the FC estate during 2004–05, and purchased research, development and surveys specifically related to this estate. In recent years FR has successfully applied for external (non-FC) funding from government departments, the European Union, 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 partnerships.

## 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 new knowledge and practical solutions based on high quality science. Our projects provide understanding, policy advice and guidelines on implementation of best practice (e.g. on forest hydrology, continuous cover forestry, timber quality, land reclamation to woodland, and restoration of native woodlands). Much of the research is directed at increasing the biodiversity, landscape and recreational benefits of woodlands. Protection of GB woodlands from pests and diseases, and predicting the impacts of environmental change are also overarching themes. FR works closely with the FC,

the Commission of the European Communities and other international organisations to ensure compliance with international agreements on the sustainable management of forests and related subjects. The Agency also carries out work on genetic conservation, tree improvement, seed testing, method studies, product evaluation, crop inventory, surveys (e.g. *The national inventory of woodland and trees*), and monitoring.

## Resources

The Agency has two main research stations, Alice Holt Lodge in Hampshire and the Northern Research Station on the Bush Estate south of Edinburgh. The main office of Technical Development (now part of Forest Management Division) is located at Ae in Dumfriesshire with subsidiary offices in the English Midlands and Wales. The Agency also has 10 field stations (the Technical Support Units) from which an extensive network of field trials, sample plots and monitoring sites is assessed. Contact information is given on page 116. The Agency employs 260 staff, not including visiting scientists and sandwich students. FR has published a Corporate Plan for the period 2005–2008 and copies are available to download from [www.forestresearch.gov.uk/corporateplans](http://www.forestresearch.gov.uk/corporateplans)

# Chief Executive's Introduction

## Challenges and goals

A further year has seen the Agency responding successfully to challenges and realising our target goals. In particular I would like to highlight that:

- We have demonstrated during the year a highly responsive work force to major challenge. This has been particularly illustrated with the onset of the threat of the disease Sudden Oak Death (SOD) caused by *Phytophthora ramorum* and associated diseases generated by other species of this pathogenic fungus. Working closely with our partners in the Forestry Commission and Defra, we have not only been able to provide the scientific background and tools to analyse the aetiology of this pathogen, but we have also been able to mobilise our Technical Support Unit across the UK to analyse the extent of the problem.
- As I start to look for a return on the investment from research I am delighted that we have begun to analyse opportunities for the exploitation of our Intellectual Property. A wide range of patenting opportunities have been identified and the advantage to the Agency would be that any funding generated from the exploitation could be utilised to further our research activity.
- Staff have become increasingly involved in the internationalisation of our research by participation in co-operative research, symposia and research discussions both in Europe through EU and COST activities and on a wider global scale. Our new divisional structure has settled in well over the course of the year. Organisation into fewer, larger units has brought about better internal communication with associated benefits to our science programmes. As for the external partnerships referred to above, there have been a number of inter-divisional initiatives to create new programmes. The outputs from some of these new areas of work are described in the Research Highlights on pages 14–25. Together with the five main articles of this report, these highlights provide a selective account of FR's research and scientific services as completed during 2004–05. (A full list of our research programmes and contracts is presented on pages 74–79.) In addition to *Phytophthora ramorum*, other current threats to tree health are summarised by Joan Webber and Hugh Evans (Highlights, pages 24 and 25), and Sarah Green's article on birch dieback illustrates the universal extent of such threats. Our social science research has continued to expand, helped by major successes in winning co-funding from the European Union. With the success of our recent EU bid in this area (EFORWOOD), our research on sustainable forest management will also benefit from being part of a European consortium in the future.

One of the best illustrations of global environmental problems to which forestry research can contribute is the issue of climate change. Trees have the capacity to sequester carbon and mitigate some of the damage generated by carbon emissions, the factor which is largely responsible for climate change. Forest Research has a tremendous capacity to monitor, analyse and quantify the magnitude of the forestry contribution to global carbon balances. I believe that we have an exceptional skill base at the investigator level, as well as having unique monitoring sites and analytical capability at those sites that can be utilised as part of international co-operation. Of course we have to be concerned about what is happening in Great Britain, but the problems are on a truly international scale. Therefore I will be looking at ways in which Forest Research can take the lead in stimulating international debate on the importance of forest ecosystems to the sustainability of the planet.

As the UK Government develops its strategy for science, I am delighted that forestry has a seat at the table of those debates; for example I personally have been pleased to attend the Chief Scientific Advisers Committee (CSAC). Increasingly, national activities in research are being tuned to international needs. For many years I have represented the UK on the Organisation for Economic Co-operation and Development (OECD) Co-operative Research Programme on Biological Resource Management for Sustainable Agricultural Systems. In that programme, which is renewed on a quinquennial basis, we have recently identified the important role that forestry plays in integrated land use and the sustainability of the environment. Similarly, Tim Rollinson as Director General of the Forestry Commission has been heavily involved as co-chair of the UN Committee on Sustainability of Forests. Between us we feel that Britain has much to contribute to the global agenda on sustainability.

One positive step forward in international co-operation was the first meeting of the European State Heads of Forestry Research Institutes in Vienna in August 2004. Good progress was made towards co-operation; I was pleased to have been invited to address the Heads of all International Forestry Research Institutes at the IUFRO Quinquennial Conference in Brisbane in August 2005.

Implicit in the international dimension is the change in place for forestry in integrated land use. In this respect we do not just have to consider the rural agenda, but also the urban and peri-urban opportunities that are created by forestry. In Great Britain, for example, there are major areas of brownfield land which lend themselves to forestry and other forms of greening. This is not just to provide an appealing landscape but also to make available the opportunity for exercise in many forms, for example walking and cycling. One of the notable events of the year was the launch of the European COST Action on Forests and Health. Working closely in association with the Scottish Executive, I deputised for the Minister (Rhona Brankin) in opening the conference and outlining the opportunities that such forestry presents, particularly in areas of social deprivation. There is a clear correlation between poor health and social deprivation. Subsequent discussions with the Chief Medical Officer in Scotland have led to co-operative agreements to encourage people to exercise on our land, as the major land owner in Great Britain. We are also working towards identifying locations where new forests might be generated in these areas of social deprivation. This is an area where our intended objective of increasing the profile of social science research alongside our natural science approaches is likely to pay strong dividends. There are huge opportunities in generating interfaces between social and natural science approaches to research.

One of the pleasing features of our development has been the networks that we are generating with partners in universities and in research institutes. Maps of our national and international links on pages 72 and 73 show the range of these networks. Such co-operation was further enhanced when the Biotechnology and Biological Sciences Research Council (BBSRC) credited us with partial academic analogue status. I am unequivocal in my view that the way forward to benefit forestry research overall is for networks to develop and share the responsibilities and kudos that are derived from analysing the critical environmental problems where forestry has a role to play.

I am pleased that we are achieving our key targets but I intend to look increasingly carefully at the way in which we communicate our results through publications and other methods. Clearly there is a need for the scientific community to be able to access through the peer review system the quality of the research that we undertake, but we need to recognise that the views of the community also need to be appraised of our outputs. These are issues of balance and I hope that our status can be enhanced by analysing more critically the communication and commercialisation of our research findings.

## Targets and achievements over the past five years

Performance measure		2000/01	2001/02	2002/03	2003/04	2004/05
Customer satisfaction	Target	96%	96%	97%	90%	90%
	Achieved	97%	97%	98%	97%	97%
Peer-reviewed papers	Target	43	48	48	45	45
	Achieved	48	48	48	45	47
Unit cost/research day (unweighted) 98/99 =100	Target	94	94	92	90	88
	Achieved	82	81	79	78	78
Unit cost of support services	Target	96	94	92	89	87
	Achieved	92	86	84	82	82
Cost recovery	Target	100%	99%	100%	100%	100%
	Achieved	100%	100%	100%	100%	99.8%
Reports, FC publications and articles <sup>a</sup>	Target	-	-	-	25	25
	Achieved	-	-	-	25+	25+
Income from customers <sup>a</sup> other than FC	Target	-	-	-	£1.5m	£1.5m
	Achieved	-	-	-	£1.65m	£2.11m
External review of research programmes <sup>a</sup>	Target	-	-	-	Silviculture	Social Research
	Achieved	-	-	-	Completed	Completed

<sup>a</sup> New targets set following the Agency's first Quinquennial Review.

## Advisory Committee on Forest Research

The Advisory Committee met in April and November 2004 at Alice Holt Lodge and Northern Research Station respectively. These meetings allowed members to get to know the staff and facilities at FR's two main research stations. The Committee also appointed and received a report from an external Visiting Group to FR's Social Research Group (chaired by Dr Victoria Edwards OBE with Professor Bill Slee and Professor Thomas Randrup as members). This Visiting Group reported that the Social Research Group has successfully established itself as an active and effective group particularly with Forestry Commission customers and within Europe. A significant amount of research has been established with EU co-funding. The Visiting Group also recommended expansion of the Social Research Group, particularly in the socio-economic area. There is a need for social research input to UK forestry and to the wider environmental and natural sciences research programme. The Group will require strategic direction, and will need to develop its intellectual direction over the next few years. The Advisory Committee also received reports on the implementation of the Visiting Group recommendations on the Entomology and Silviculture programmes (2003) and was kept informed of the preparation of the FC's new Science and Innovation Strategy by the FC Research Strategy Management Board.

## Finance

Income in the year increased by 6.0% compared to the previous year. Within this, non-FC income exceeded £2.0 m for the first time. There was a 5% increase in payroll costs with an overall increase in operating expenditure of 6% over 2003–04 levels.

Unexpected and unplanned premature retirement costs of £135,000 arose in the latter half of the year and it proved too late to secure the full recovery of this sum from other sources. As a result the net

operating surplus fell short of the target of £409,000 by £27,000, delivering a full cost recovery performance of 99.8% against the target of 100%.

Capital investment of £398,000 covered a wide range of scientific and technical purchases including, notably, dedicated electrical supplies, chemical analysis equipment, updated data capture systems as well as IT equipment and laboratory, office and infrastructure refurbishments.

## People

Over the past year, Forest Research welcomed almost 30 new members of staff who have joined existing staff across FR's sites. Amongst these are:

David Beattie who joined FR (THD) to work on species boundaries in *Phytophthora* pathogens in trees, on a newly established Defra student fellowship. David has previously worked on the genetics of potato blight at UCW Bangor. Finlay McAllister who transferred from Technical Services at Shobden to FMD's Technical Development team, as a Technical Development forester based at Talybont. David Edwards who joined FR as social sciences project leader in the EHSD. David's work has included participatory approaches to issues of land use and rural development. His responsibilities will include work on the new EC contracts RECOAL and SENSOR. Heike De Silva who joined THD at NRS, to study the distribution and biology of the fungal pathogen responsible for birch dieback in Scotland. Heike, originally from Germany, completed an MSc in Horticultural Science in 2003 in New Zealand.

Janet Dutch took over as head of Technical Services Unit (TSU) in August 2004, and is based at NRS. Janet transferred to FR from the FC, having worked previously as Special Advisor for the physical environment and, from 1999 to 2004, as part of the Forest Enterprise GIS development team. Nadia Barsoum joined EHSD to lead the 'Environmental monitoring and evaluation of forest ecosystems' programme. Previously Nadia worked on Riparian Ecology at the Centre d'Ecologie de Systèmes

Aquatiques Continentaux, Toulouse and the Universities of Umeå and Mid-Sweden. Jeff Sharp joined FMD at NRS as an IAESTE (International Association for the Exchange of Students for Technical Experience) trainee working on the stability, timber quality and silvicultural systems programmes. Joy Cornwell joined BSSD as Divisional Administrative Support Officer. Joy previously worked for Historic Royal Palaces at the Tower of London. Maureen Wilkes joined Alice Holt Typing Services, moving from working at Farnham Hospital. Xanthe Christophers joined FR as Director of Communications, coming from a background in international development and natural resources, most recently working for Barnardo's.

Many FR staff are recognised internationally as experts in their research fields. I would like to congratulate all the staff who have been honoured by awards or who have achieved qualifications over the past year including:

Alexis Achim (FMD) who was awarded a PhD from the Université Laval, Quebec; Andy Moffat (Head of EHSD) who was awarded a DSc from Reading University and Bill Mason (Head of FMD) who was awarded Honorary Fellowship of the College of Science and Engineering, University of Edinburgh. Sam Evans (Head of BSSD) was honoured with a Visiting Professorship at the University of Sheffield, linked to the NERC Centre for Terrestrial Carbon Dynamics in the Department of Applied Mathematics.

Jason Hubert (ED) was invited to join FC Scotland Broadleaves Working Group, to explore opportunities to grow quality broadleaves in Scotland. Kath Thorpe (THD) joined the Executive Board of the International Society of Arboriculture (UK and Eire Chapter). Martin Jukes (THD) gained the Diploma in Health and Safety Management and became a member of the Institute of Occupational Safety and Health. And Ralph Harmer (ED) was awarded the James Cup 2004 for *'Bramble for beginners'* – the best article of the year in the *Quarterly Journal of Forestry* 98(4), 273–279.

But sometimes we say goodbye to old friends. This year, almost 20 members of staff have left, some of whom had been with FR for many years. We will particularly miss the professionalism and familiar faces of:

Dave Durrant (EHSD) who retired after 23 years supporting and leading research projects examining the effects of air pollution on trees. His field studies have included the establishment and management of the Level II network of intensively monitored sites, and promoting the work across Europe. Derry Neil (FMD) retired after almost 40 years with FC, FE and latterly with FR. During his time in Technical Development, Derry saw the group move from Research to Forestry Authority and back to Research. Ralph Nickerson (TSU), whose career spanned 40 years and three continents, and Tim Cooper (BSSD) who took early retirement after 29 years with FR.

### Visitors and events

Forest Research operates in the increasingly high profile area of the environment and natural resources alongside universities and other research organisations. Over the past year, visits from overseas scientists and interested policy-makers, and participation at a range of events, has ensured that FR is increasingly known for providing excellent research coupled with practice-based outputs both within and beyond the UK.

The Forestry Minister for England, Ben Bradshaw, visited Alice Holt in July 2004, to get an insight into Forest Research's work. During the visit, Mr Bradshaw discussed with scientists a number of topical issues including climate change, woodfuel, *Phytophthora ramorum* and squirrel management. The FC Commissioner Anthony Bosanquet also visited Alice Holt to catch up on latest research developments. Topics discussed included the work of the Social Research Group, hydrology projects, continuous cover forestry, squirrel management and the joint landscape project 'BEETLE', currently being undertaken by FR with the Countryside Commission of Wales. The FC's Expert Group on Research and

Development met at Alice Holt in May 2004. As well as discussing environmental research, FR's modelling work, forest protection, continuous cover forestry and the Social Research Group, they toured the Chemical Analysis Service, the Soils Laboratory, and Seed Testing.

Thirteen foresters from the province of Himachal Pradesh in Northern India spent two days with FR at Alice Holt, as part of a two week training programme organised by Tropical Forestry Resource Group. The main focus of the course was the formulation and implementation of forestry policy, but delegates also participated very enthusiastically in a tug-of-war at the Alice Holt 'Olympics'!

FR's exhibit at the Royal Society Summer Science Exhibition: *Biological cruise missile: beetle vs beetle in forest protection* attracted considerable attention from both visitors and the media. The evening soirée was attended by the FC Chairman Lord Clark and Director General Tim Rollinson. Hugh Evans (Head of THD) was subsequently interviewed by BBC Radio 4 for the programme: *Leading Edge*. Hugh visited Beijing in May 2004 to attend the XV International Plant Protection Congress. In addition to organising and chairing a forestry section session, he presented two papers on FR's biological control programme against *Dendroctonus micans* using the predator *Rhizophagus grandis*.



Tug-of-war at the Alice Holt 'Olympics'.



Discussions with visitors to FR's exhibit at the Royal Society Summer Science Exhibition 2004.

Jim Lynch attended the first international meeting of the Heads of European State Forest Research Institutes hosted by the Austrian Federal Office and Research Centre for Forests in Vienna. Delegates were enthusiastic about the new opportunities for the closer integration of forestry and environmental programmes across the expanded European arena. Tim Rollinson was among the visitors to Forest Research's stand at APF 2004, the largest UK arboriculture, forestry and woodland show. The focus of FR's stand was the new guidance on best practice for winching and the importance of ground preparation techniques for root development and stability. FR's new award-winning excavator bucket design attracted considerable attention.

FR's successful seminar, 'Accessibility of woodlands and natural spaces', attracted a wide-ranging audience including planners, police, academics and environmental professionals. It addressed five themes: access and perception of risk; how to manage exclusionary behaviour; access and liability; crime reduction and rehabilitation of offenders; and the location and design of accessible woodland. The workshop was organised by Liz O'Brien and Paul Tabbush (EHSD), with backing from English Nature, CABE Space and Lancashire Constabulary. The 'Ecology and management of large native pinewoods' conference, held in Inverness-shire by

FR and BES, brought together a wide range of groups interested in pinewood ecology and biodiversity. The issue of climate change and its influence on the pinewood ecosystem was a major area of debate. The very successful Annual FTA/ICF Research Update (at NRS) sponsored by FC Scotland covered a range of topics including forest habitat networks, climate change and dieback of birch in new native woodlands.

The new *Woodfuel information pack*, written by Duncan Ireland, Andy Hall and David Jones, was launched by Geoff Hatfield (Director FE England) at 'Woodfuel – getting it right', a workshop which combined talks from industry experts and site visits to installations and woodland production sites. The workshop aimed at improving awareness of the opportunities that wood and forest residues present as a source of renewable energy and to increase understanding of the harvesting, processing and combustion of wood as a fuel. In September, at Heriot-Watt University, Edinburgh, 125 delegates from around the globe attended the 'Forestry woodchain' conference organised jointly by FR and BRE.

Hugh Evans (Head of THD) visited New Zealand to deliver a seminar on Forest Research's UK plant health work to the Forest Research institute at Rotorua and to speak about invasive organisms to the New Zealand bio-security group based in Wellington. Hugh also attended the IUFRO Conference in Hanmer Springs to deliver two joint papers developed with Nigel Straw and Christine Tilbury, on pinewood nematodes and horse chestnut leaf miner, and the International Entomology Conference in Brisbane, Australia to deliver two further papers on pest risk analysis and plant resistance.

Jim Lynch gave the keynote opening address at the Rhizosphere 'Perspectives and challenges' conference in Munich in September and co-chaired the closing session. The meeting was co-sponsored by EU and OECD and attracted 450 participants. Jim Lynch and Bill Mason also gave keynote lectures at the EFI Conference in Bangor on 'Continuous cover forestry', which was well attended by FR staff. Joan Webber contributed to the 'Plant health and seed inspectorate' annual conference, discussing the quarantine of *Phytophthora*. Andy Moffat presented at SUBR:IM's annual conference on 'Joined up regeneration of brownfields'.

### Quality Assurance

FR is dedicated to achieving and maintaining appropriate standards of quality in order to meet the needs of its work programmes and the requirements of its internal and external customers. Over the past year, FR has introduced its Quality Assurance (QA) system to meet the requirements of the Joint Code of Practice for Research (2003) and all staff have attended comprehensive QA seminars. The Joint Code was developed in partnership between the Department for Environment, Food and Rural Affairs (Defra), the Biotechnology and Biological Sciences Research Council (BBSRC), the Food Standards Agency (FSA) and the Natural Environment Research Council (NERC). The Joint Code has subsequently been endorsed by The Scottish Executive and Rural Affairs Department (SEERAD), the Welsh Assembly Government Agriculture and Rural Affairs Department (WAGARAD), and the Department of Agriculture and Rural Development for Northern Ireland (DARDNI).

The Joint Code provides a framework for auditing research processes and applies, where possible, to all research funded by Defra, the FSA, SEERAD, DARDNI and WAGARAD and to research funded by BBSRC and NERC in their own institutes.

FR has also retained Pesticide Safety Directorate (PSD) accreditation as a recognised testing station for chemical and other plant protection products and continues to work towards full integration of both the PSD and QA systems.

## Freedom of Information

The Forestry Commission's Open Information Group was charged with ensuring that all parts of the FC were ready when the Freedom of Information (FOI) Act came into force on the 1 January 2005 to deliver a competent 'Open Information' service to the public. Open Information encompasses the Freedom of Information Act, the Data Protection Act, Environmental Information Regulations and records management. Over the past year, training courses and briefing sessions at Alice Holt and NRS have enabled FR staff to understand their role and develop processes to provide this service to the public.



A handwritten signature in black ink, which appears to read 'Jim Lynch'.

Professor Jim Lynch  
Chief Executive

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