

Publications and events

Forest Research publishes a wide range of material, from corporate reports and plans, to brochures, project summaries and technical reports. In addition, our researchers publish peer-reviewed articles in scientific journals and produce books through external publishing houses.

Forestry Commission technical publications

The following titles were published during the year ending 31 March 2010.

Published by Forest Research

To obtain copies of FR publications, email: library@forestry.gsi.gov.uk or visit www.forestry.gov.uk/fr/publications

Corporate publications

Forest Research annual report and accounts 2008–2009 (£19.15)

Forest Research corporate plan 2010–2011 (online publication, free)

Forest Research – Much more than trees, corporate brochure (printed and online, free)

Trees and forests in British society – Ten years of social science. An eight-page booklet with highlights from the past ten years of social science research at FR, published March 2010 (printed and online, free)

Newsletters, booklets and leaflets

FR News. Forest Research's quarterly newsletter, giving details of recent projects and developments (online publication, free)

www.forestry.gov.uk/fr/frnews

Ecotype. Biodiversity and conservation newsletter (online publication, free)

www.forestry.gov.uk/fr/ecotype

Growing places. Social and Economic Research Group newsletter (printed and online publication, free)

www.forestry.gov.uk/fr/growingplaces

Path News. Pathology bulletin (online publication, free)

www.forestry.gov.uk/fr/pathnews

Social research project summaries produced by FR's Social and Economic Research Group (online publications, free):

Active England evaluation

Growing Places: a study of social change in The National Forest

A decision framework for public involvement in forest design planning

Offenders and Nature schemes: using conservation and forest management in rehabilitation

A valuation of the economic and social contribution of forestry for people in Scotland

Carbon valuation, discounting and risk management

Sustainability impact assessment: tools for environmental, social and economic effects of multifunctional land use in European regions (SENSOR)

The 'Faith Woodland' project in Maulden Woods: an evaluation

Assessing and communicating animal disease risks for countryside users

Collaborative frameworks in land management: a case study of wild deer management in Britain

The management of roe deer in peri-urban Scotland

A review of TreeGeneration: the urban forestry project for north-east Wales

RECOAL: Reintegration of coal ash disposal sites and mitigation of pollution in the West Balkan area

Wood you believe it? Children's and young people's perceptions of climate change

Public benefits from private forests and woodland in England: classifying private woodland owners

Carbon additionality

Social research and the Forestry Commission: perceptions and applications

Published by the Forestry Commission

The publications listed below have been written by Forest Research staff for the Forestry Commission. For more details or to order an FC publication, visit the Forestry Commission online publications catalogue at www.forestry.gov.uk/publications

Research Notes (free)

Green, S. and Ray, D. (2009)

FCRN004. *Potential impacts of drought and disease on forestry in Scotland*. 8pp.

Macdonald, E., Moore, J., Connolly, T. and Gardiner, B.A. (2009)

FCRN005. *Developing methods for assessing Scots pine timber quality*. 8pp.

Research Reports

Edwards, D., Elliott, A., Hislop, M., Martin, S., Morris, J., O'Brien, L., Peace, A., Sarajevs, V., Serrand, M. and Valatin, G. (2009)

FCRR101. *A valuation of the economic and social contribution of forestry for people in Scotland*. 206pp. £19.50.

Technical Note (free)

Mochan, S., Moore, J. and Connolly, T. (2009)

FCTN018. *Using acoustic tools in forestry and the wood supply chain*. 6pp.

External publications

Papers published in peer-reviewed journals, 2009–2010

A'Hara, S. and Cottrell, J.E. (2009)

Development of a set of highly polymorphic genomic microsatellites (gSSRs) in Sitka spruce (*Picea sitchensis* (Bong.) Carr.). *Molecular Breeding* **23** (2), 349–355.

A'Hara, S.W., [Hancock, M., Piertney, S.B.] and Cottrell, J.E. (2009)

The development of a molecular assay to distinguish droppings of black grouse *Tetrao tetrix* from those of capercaillie *Tetrao urogallus* and red grouse *Lagopus lagopus scoticus*. *Wildlife Biology* **15** (3), 328–337.

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Rapid emergence of hybrids between two subspecies of *Ophiostoma novo-ulmi* with a high level of pathogenic fitness. *Plant Pathology* **59** (1), 186–199.

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[Calder, I.R., Harrison, J., Nisbet, T.R. and Smithers, R.J.] (2008)

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Letter to the editor: A leap forward in geographic scale for forest ectomycorrhizal fungi. *Annals of Forest Science*, **67** (2), Item No 200, 6pp.

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Dalrymple, S.E. and Broome, A.C. (2010)

The importance of donor population identity and habitat type when creating new populations of small cow-wheat *Melampyrum sylvaticum* from seed in Perthshire, Scotland. *Conservation Evidence* **7**, 1–8.

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Books, proceedings and other technical publications, 2009–2010

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Regeneration in CCF. (Letter). *Quarterly Journal of Forestry* **103** (4), 256.

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Challenging the old conventions. Becoming more proactive and customer focused – those are just two changes facing Forest Research under new Chief Executive Dr James Pendlebury as the industry gets to grips with major issues such as climate change. (Interview). *Chartered Forester*, Winter 2008, 16–17.

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Under cover for climate change. Victoria Stokes and Gary Kerr summarise the Forest Research report commissioned by Forestry Commission Scotland to answer the question 'What evidence exists to support the use of Continuous Cover Forestry as part of the strategy to adapt Scotland's forests to the risks of climate change?' *Chartered Forester*, Spring 2010, 14–15.

Webber, J.F. (2009)

Seek and destroy. Eradication or containment are the principal methods employed to deal with *Phytophthora* pathogens that affect trees in Great Britain. Dr Joan Webber, principal pathologist with the Forestry Commission's Forest Research arm, presents an overview and update on the status of the pathogens' advance and management. *Horticulturist* **18** (4), 5–7.

White, G., Mayle, B.A. (2010)

Squirrel control. SWA member Geoffrey White asks what measures are being taken to combat grey squirrels. FC's reply: Brenda Mayle, who heads the Vertebrate Management Group at Forest Research responds to the comments. *Smallwoods*, Spring 2010, 16–17.

Williams, H.V. (2008)

The heat is on for future timber. Assessing timber quality in an age of climate change is the plan of a new research programme, says Dr Hugh Williams, Forest Research. *Chartered Forester*, Winter 2008, 11.

Williams, H.V. (2008)

Spreading their wings. Forest Research is investing more than a quarter of its total research budget (circa £10.3 million in the financial year 2008/09) directly on climate change programmes. Dr Hugh Williams, Forest Research explains. *Chartered Forester*, Winter 2008, 12–13.

Events

During the year staff from across Forest Research took part in a number of national and international conferences, seminars and meetings, sharing their knowledge, disseminating best practice and furthering collaboration with other organisations and people. A selection of key events from the year is highlighted below. Further details, and a full list, can be found on the Forest Research website: www.forestry.gov.uk/fr/events

Forest Research directly organised fourteen events to support the forest industry. Topics included disease and pest management, with a series of training days on *Hylobius* management and three more-general forest health days. Broader research updates were provided at the Northern Research Station, near Edinburgh, and at Aviemore. More-specific events were organised on continuous cover forestry in Sitka spruce, growing broadleaves for quality hardwood timber and on the resource availability and market potential of Scots pine in north Scotland. In addition to these daylong events, Forest Research also ran a winter seminar series at the Northern Research Station presented by our own scientists and visiting speakers, and covering topics such as short-rotation forestry, the Glasgow and Clyde Valley partnership, remote sensing and Scottish Government policy on renewables. It is worth noting that all our technical events and seminars are recognised as counting towards Continuous Professional Development (CPD) by the Institute of Chartered Foresters.



Forest Research also organised two large conferences. A three-day workshop under the auspices of the EU-funded TreeBreedEx project discussed the state of play of clonal forestry currently being practised around the world and investigated the possibilities for Europe. Forest Research also co-sponsored the three-day 'Ecological networks: science and practice' conference with the International Association for Landscape Ecology.

This year we held events for the general public at the new Royal Botanic Garden Edinburgh's Real Life Science Lab, as part of the Edinburgh International Science Festival. These events, attended by over 1,500 members of the public, aimed to deliver science messages based around the International Year of Biodiversity.

Many events involve collaboration or partnerships with other organisations, for example Natural England and the Scottish Environment Protection Agency (SEPA). In particular, Forest Research has strong links with the Institute of Chartered Foresters and was heavily involved with their 2009 National Study Tour examining silviculture in a changing climate. FR also supported the Royal Forestry Society field visits to south-east and south-west Wales and a more focused field visit and outdoor presentation on Chronic Oak Decline in the Forest of Dean.

Research programmes and contracts

Forest Research carries out a wide range of research programmes, encompassing topics from across the spectrum of forestry and related environmental subjects. Our work aims to support and enhance forestry and its role in sustainable development. This year's programmes are listed as follows.

Major research programmes undertaken by Forest Research

Project leaders' names are given for each programme.

Programmes funded by the Forestry Commission

Bio-energy development

Ian Tubby

Provide best practice guidance to woodland owners and industry. Provide advice and relevant information to policy-makers, developers, local authorities and the public on all aspects of biomass fuels and associated conversion technologies via the Biomass Energy Centre (www.biomassenergycentre.org.uk). Investigate systems and methods for harvesting, extracting, handling and processing woodfuel to improve financial and environmental sustainability.

Changing physical environment

Tom Nisbet

Support the development and implementation of sustainable forest management with respect to the protection of soil and water. In particular, address the effects of forestry on soil carbon, the impact of climate change on soil functions, the effects of forestry on water quality and quantity, the role of forests in sustainable flood management, and the use of woodland to control diffuse pollution.

Climate change adaptation

James Morison

A multi-disciplinary programme to assess the adaptation requirements and possibilities for forests in the UK. Using scenarios of climate change, forest management and land use and institutional structures/decision making processes, the assessment is considering the multiple functions of forests. It is developing the necessary integrated tools to assess adaptation strategies and to feed into future national adaptation programmes.

Emerging pests and pathogens

Anna Brown

Monitor the distribution, rate of spread, severity and impact of three recently introduced and expanding pathogens, *Dothistroma septosporum* (red band needle blight), *Phytophthora ramorum* (sudden oak death) and *Phytophthora kernoviae*. Investigate their biology and epidemiology, determine the suitability of different management strategies and provide rapid dissemination of the results to advise government, landowners and managers and other stakeholders.

Forest resource modelling and forecasting

Robert Matthews

Improve methods, models and systems for forecasting growth and yield of forests. Develop and promote systems and instruments for the efficient and accurate measurement of trees and timber to support industry. Develop and maintain the national network of growth and yield plots to support measurement, growth and yield studies. Calibrate the MOSES model to address the complex stands that are being created in Britain by Continuous Cover Forestry systems.

Forestry and carbon (GHG) management

James Morison

Examine and quantify the consequences of different forest management practices and operations, including the contribution of forest products and bioenergy in the forestry sector GHG balance. Also covers national and international reporting of carbon stocks and GHG balances and sets standards for forest carbon assessment methods. Develop tools and knowledge resources, underpinned by fundamental field-based research.

Genetic improvement

Steve Lee

Assess genetically determined traits in conifers (principally Sitka spruce, Scots pine, and larch) and broadleaved species (initially oak and ash). Select and breed from individuals with desirable properties. Supply seed from improved families to the nursery sector. Develop advanced breeding technologies, including tissue culture and cryopreservation. Advance techniques for marker-aided selection.

Habitat management

Ralph Harmer

Investigate the development of native woodlands and their constituent communities in relation to their age, composition, location and management and on the restoration of priority open habitats. Effort will be focused upon habitat development in newly created woodlands, responses of existing woodland habitats to management, and restoration of plantations on ancient woodland sites (PAWS).

Integrated forest monitoring (including research forests)

Andy Moffat

Bring together important monitoring platforms in FR to deliver a more integrated data service for scientists and policy makers. Determine the role of climate change and air pollution in forest condition and growth through long-term intensive environmental monitoring in forest ecosystems. Provide data under the Convention on Transboundary Air Pollution for the calculation and mapping of critical loads.

Knowledge management for biodiversity and ecosystem services

Duncan Ray

Develop spatial planning tools to consider key elements of landscape ecology and cultural heritage. Use landscape genetics to validate ecological principles. Assess the impact of new methods of forest management upon biodiversity, and develop methods of summarising and incorporating complex and diverse knowledge in decision-supporting tools.

Pests and pathogens under environmental change

Nigel Straw

Investigate the implications of alternative silvicultural systems in relation to insect abundance and diversity, especially for key pest species. Use model systems to predict the impact of changing climate including the influence of voltinism in *Hylobius abietis*, the interaction between drought stress and fungal disease of trees, and the changing susceptibility of oak to broadleaved pests and pathogens influenced by climate.

Physical properties of stands, trees and timber

Barry Gardiner

Investigate the impact of silvicultural practices on timber quality in conifers, especially spruce, with current focus on site factors (e.g. exposure, fertility) at both individual and stand level. Evaluate and promote the potential of remote sensing technologies for operational use in the management of British forests. Research to reduce wind damage to British forests using a GIS-based model for predicting the probability of windthrow in Sitka spruce forests.

Social and economic research

Anna Lawrence

Examine how trees, woods and forests contribute to well-being, how diversity and equality can be incorporated in accessibility and access, how woodlands can contribute to community development, how governance is embodied in the decision-making processes of sustainable forest management, and how economic tools can be developed to value the benefits of woodlands, including carbon sequestration.

Species and gene conservation

Joan Cottrell

Develop an understanding of genetic variation and gene flow in native tree species, and assess the level of adaptive variation in field trials. Use molecular methods to investigate the ecology of a range of priority and problem species. Provide knowledge to support the protection and encouragement of woodland species identified as priorities within the UK Biodiversity Action Plan.

Stand management and harvesting

Gary Kerr

Understand how to manipulate woodlands to transform even-aged stands to continuous cover forests (CCF). Improve the predictability of natural regeneration during transformation and CCF. Produce practical recommendations for respacing dense regeneration. Produce a wind risk model that can be applied to any stand structure. Evaluate the role of CCF in mitigating the effects of climate change. Provide information and advice for forest managers and policy makers.

Tree health regulatory support

Joan Webber

Co-ordination and implementation of surveys in relation to retention of EU Protected Zone status for named bark beetle pests. The use of Pest Risk Analysis techniques to determine risks from named non-indigenous pests and pathogens. Provide an advisory service to determine the causes of ill health in trees, their management and control. Disseminate the information to all interested parties through outreach activities.

Urban greenspace

Tony Hutchings

Demonstrate the value of urban greenspace to society and how green infrastructure can mitigate against the impacts of climate change. Lead the development of an Urban Regeneration and Greenspace Partnership to co-ordinate development and implementation of a common research strategy and provide a dissemination portal for green infrastructure. Improve establishment methods and management practices for urban woodland on disturbed (brownfield) sites.

Vertebrate management

Brenda Mayle

Scope the potential for impact of alien and invasive vertebrates. Develop techniques and materials for cost-effective protection of trees and woodland biodiversity from mammal damage, particularly by grey squirrels. Provide a sustainable basis for deer management in UK woodlands by investigating models of impacts and damage, population dynamics of deer, deer density assessment and grazing management.

Regeneration and sustainable silviculture

Ian Willoughby

Improve the success of woodland regeneration from seeds. Understand the underlying processes of regeneration most likely to be affected by predicted changes in climate. Identify methods of reducing herbicide inputs. Advise on pesticide use and minimisation. Support the delivery of sustainable regeneration systems. Provide expert support for re-registration of fungicides. Investigate alternative biological control agents for *Heterobasidion annosum*, the cause of conifer root and butt rot disease.

Technical development of woodland operations

Michael Wall

Promote sustainable forest management by developing, evaluating and promoting safe and efficient equipment and methods of work; topics include establishment, maintenance, integrated forest management, ecosystem management, harvesting and transport. Maintain output information. Provide advice on forest operations to both managers and other research staff. Respond to emerging forest operations issues by analysing situations and providing options to address them.

External income

Programmes part-funded by the European Commission

COMFOR

Ian Murgatroyd

Tools and methods to help solve the common problems of occupational health and performance in European forest operations, tested by small and medium enterprises (SMEs). FP6 project involving 21 partner organisations in 10 countries.

www.enfe.net/comfor.htm

Developing the Scots Pine resource

Elspeth Macdonald

Timber quality assessment and forecasting to support the development and utilisation of Scots pine timber for sustainable rural enterprises. Interreg Northern Periphery Programme project with six partners across northern Europe.

www.pineinfo.eu

EFI Storms Project

Barry Gardiner

A project funded by DG Environment to investigate storm damage to forests as part of EU initiative on forest protection. Eight European partners.

http://w3.pierroton.inra.fr/IEFC/bdd/storm/storm_liste.php

EFORWOOD

Bill Mason

Sustainability impact analysis of the European forestry wood chain under different scenarios and developing decision support tools to help evaluate changes in practice and market fluctuations. FP6 project involving 38 partner organisations in 21 countries.

www.eforewood.com

FORESTCLIM

Tom Nisbet

Transnational forestry management strategies in response to regional climate change impacts. INTERREG IVB North West Europe project involving five countries and 21 partners.

www.forestclim.eu

FUTMON

Andy Moffat

Further development and implementation of an EU-level Forest Monitoring System. LIFE+ project to ensure pan-European monitoring systems meet EU policy needs. Participants from 24 EU Member States.

www.futmon.org

MOTIVE (MOdels for AdapTIVE Forest Management)

Bruce Nicoll

This project will provide methods and tools to assist forest policy development and adaptive management in a changing climate. FP7 project with 20 European partners.

<http://motive-project.net/index.php>

MultiFor

Nadia Barsoum

Developing a joint cross-border strategy to understand the climate change responses, multifunctional value and adaptation capacity of forest ecosystems commonly found in south England and north-east France. Interreg IVA 'Two seas' programme project with nine partners.

www.forestry.gov.uk/fr/multifor

Northern ToSIA

Barry Gardiner

Analysing the sustainability impact of forest management practices in selected forests in northern Europe with a focus on Scots pine. Interreg Northern Periphery Programme project with five partners across northern Europe.

www.northerntosia.org/portal

NOVELTREE

Steve Lee

Using cutting-edge techniques to find DNA-markers linked to economically important traits and then demonstrating how these can be used to improve the efficiencies of tree breeding. FP7 large-scale integrated project involving 15 institutes.

www.noveltree.eu

REINFFORCE

Richard Jinks

Adapting Atlantic forests in Europe to predicted climate change including the potential role of different tree species and the risk from novel pests and pathogens. Interreg IVB Atlantic Arc project involving 12 organisations from Portugal, Spain, France and the UK.

<http://reinfforce.iefc.net>

TREEBREDEX

Steve Lee

Integrated information on tree breeding. Linking information on tree breeding programmes across major European countries to share genetic material, data and information for species that cross country boundaries. FP6 project involving 28 institutes across Europe.

<http://treebreedex.eu/>

Programmes funded by other organisations

Forest Research carries out work for a variety of public and private sector clients. This list highlights some of these recent projects.

Aberystwyth University, Institute of Biological, Environment and Rural Sciences (IBERS)¹

Ian Tubby

Development of sustainable heat and power fuelled by biomass from short-rotation coppice in Wales.

Centre for Ecology and Hydrology (CEH)

Robert Matthews

Inventory and projections of UK emissions by sources and removals by sinks due to Land Use, Land-Use Change and Forestry (LULUCF).

COFORD

Duncan Ray

CLIMADAPT: Development of an Ecological Site Classification (ESC) for Ireland. Assessment of species suitability in Ireland, and the impact of IPCC climate change scenarios on forest stands and forest ecosystems using ESC.

Department for Business, Innovation and Skills (BIS)

Tony Hutchings

CHARCOAL: The use of biologically enhanced charcoal for *in-situ* remediation of contaminated land.

Chris Mort

Innovation and New Markets (INM): working with the Northern Ireland Forest Service and the Forestry Commission to develop the wider economic benefits of forestry and assist the development of new products, services and technologies.

Department for Environment, Food and Rural Affairs (Defra)

Tom Nisbet

Slowing the flow at Pickering: project aimed at demonstrating how the integrated application of best land management practices can reduce flood risk.

Hugh Evans

Hedgerow project: determine the number of trees that need planting per year to maintain the hedgerow tree population. A literature review to highlight ecological value of hedgerow trees for invertebrates.

Roger Trout

Edible dormouse (Glis): investigation of alleged populations outside the Chilterns stronghold and developing means to control populations.

Kevin Watts

Development of an indicator of landscape connectivity for implementation using Countryside Survey data from CEH as part of UK level biodiversity reporting.

Defra/Communities and Local Government (CLG)/ Homes and Communities Agency (HCA)/ Natural England

Tony Hutchings

Benefits of green infrastructure. A report and critical review of the most important ecosystem services provided by greenspaces in urban areas.

Defra/Forestry Commission

Brenda Mayle

In collaboration with the Food and Environment Research Agency (Fera), develop approaches to evaluate and mitigate the environmental impact of wild boar in woodland, in particular using thermal imaging for population estimation and evaluation of impacts on dormice, plants and insects.

Engineering and Physical Sciences Research Council (EPSRC)

Tony Hutchings

PURE: an investigation, in association with the University of Surrey, into pollutants in the urban environment and the mitigating effects of green infrastructure.

Environment Agency

Robert Matthews

BEAT2: in partnership with AEA and North Energy Associates, producing lifecycle greenhouse gas emissions data for the use of UK and international forestry to produce heat and power.

EPSRC/Leeds University

Robert Matthews

SUPERGEN: The production of different types of biomass and their behaviour in thermal conversion processes, with particular emphasis on the interaction and interface between production and conversion.

¹ Formerly Institute of Grassland and Environmental Research (IGER).

Fife Coast and Countryside Trust

Darren Moseley

Identifying the thematic and spatial priorities for developing an Integrated Habitat Network (IHN) in Fife and opportunities to enhance and expand the IHN through strategic land allocation areas.

Imperial College

Joan Webber

Memory and prediction in plant disease management. Lessons learnt from Dutch elm disease, applied to assessing the threat from sudden oak death in Britain.

James Jones & Sons Ltd

Shaun Mochan

Testing and grading analysis of timber.

Leverhulme Trust

Clive Brasier

Dutch elm disease. Assessing new hybridisation events involving the two sub-species of the Dutch elm disease pathogens (*Ophiostoma novo-ulmi*) now present in Europe.

National Forest Company

Nadia Barsoum

Develop, implement and monitor climate change adaptation provenance trial.

Natural England

Sandra Denman

Distribution and impact of Acute Oak Decline (AOD). Training course for NE regional managers on identification and basic site survey. Detailed survey and mapping of AOD sites as part of investigating the spatial relationships between symptomatic and non-symptomatic trees.

Natural Environment Research Council (NERC)

Robert Matthews

QUEST forestry demonstrator project for climate mitigation.

Robert Matthews

QUEST QUATERMASS: This project, led by Dr Jeremy Woods of Imperial College London, seeks to estimate the potential of terrestrial ecosystems to mitigate climate change.

Rural Economy and Land Use Programme (RELU)

Chris Quine

Assessing and communicating animal disease risks for countryside users.

Liz O'Brien

Collaborative frameworks in land management: a case study on integrated deer management.

Scion, New Zealand Forest Research Institute

Joan Webber

Biocontrol of Dutch elm disease with fungal viruses. Analysis and testing of fungal viruses for their potential to control the Dutch elm disease pathogen (*Ophiostoma novo-ulmi*) in New Zealand.

Scottish Forestry Alliance Biodiversity Group

Mike Smith

Method development, data collection and analysis to provide biodiversity monitoring for new native woodlands established on Scottish Forestry Alliance sites, funded by BP Exploration Operating Co. Ltd.

Scottish Government

Helen Armstrong

Measuring deer health and welfare. In collaboration with the Macaulay Institute, develop and test a protocol for the monitoring of the health and welfare of red deer in Scotland.

Scottish Natural Heritage (SNH)

Russell Anderson

Monitor cattle grazing as vegetation management to improve conditions for Black Grouse, with a focus on vegetation structure and diversity and food availability for chicks during their insectivorous phase.

Duncan Ray

Network species library. Meeting the data needs of ecological modelling by establishing a 'species trait library' relevant to the needs of spatial landscape planning, ecological modelling and land management decision making in Scotland.

SNH/The Royal Society for the Protection of Birds (RSPB)

Russell Anderson

A joint working group (FC, FR, RSPB and SNH) examining evidence on how forestry impacts on interest features of Flow Country designated sites and recommending measures to negate impacts.

Southampton University

Mark Oram

Management of poplar trials; maintenance of collections of poplar clonal material growing in stool beds.

South West Woodland Renaissance

Mark Oram

Completing a woodland inventory and production forecast for productive conifer woodlands within SW England, highlighting potential constraints to resource availability.

The Food and Environment Research Agency (Fera)

Joan Webber

Diagnosis of samples from trees suspected of infection by quarantine pathogens *Phytophthora ramorum* and *P. kernoviae*, in support of the Fera-led Phytophthora Programme.

Joan Webber

Epidemiology of quarantine pathogen *P. ramorum*, currently infecting Japanese larch in the West Country.

Joan Webber

Epidemiology of quarantine pathogen *Phytophthora kernoviae* which poses a threat to *Vaccinium* in ancient semi-natural woodland (ASNW).

United States Department of Agriculture Forest Service

Joan Webber

Studies on *Phytophthora ramorum* and *P. kernoviae* to evaluate infection behaviour and the inoculum behaviour of *P. ramorum* and the role of both in asymptomatic infection.

Joan Webber

Zoospore infection of bark. Assessment of the comparative susceptibility of a range of broadleaf and conifer hosts exposed to natural inoculum levels of *Phytophthora ramorum* and *P. kernoviae*.

Research contracts awarded by Forest Research

Environment Agency (Wales)

Effects of forestry on surface water acidification.

Fountain Forestry

Water monitoring in Halladale.

INNVENTIA AB (formerly STFI-PACKFORSK)

Analysis of microfibril angle and other cellular properties of Sitka spruce trees.

University of Bristol

Landscape history of Savernake Forest.

University of Durham

Modelling the impact of land management measures in Pickering Beck and River Seven catchments on flood risk.

University of Glamorgan

Elaboration of a methodology to identify larch stands in western Britain.





People

Permanent and fixed-term staff as at 31 March 2010.

Chief Executive

Dr James Pendlebury,
BSc, PhD, MIWSc

Chief Scientist

Professor Peter Freer-Smith,
BSc, PhD, DSc

Head of Alice Holt Research Station

Hugh Williams, BA, MSc, FICFor, PhD

Head of Northern Research Station

Chris Quine, MA, MSc, FICFor, PhD

Head of Unit, Wales (Aberystwyth)

Hugh Evans, BSc, DPhil, FRES

Chief Executive's Office

Carl Foster
Claire Holmes
Helena Ladbury
Andrew Price,¹ BSc

Centre for Forestry and Climate Change

Andy Moffat, BSc, PhD, DSc, MICFor

Head of Centre

Lorraine Adams, BSc
Richard Baden, BSc
Sue Benham, BSc, PGCE
François Bochereau, BSc, MSc
Clive Brasier, BSc, PhD, DSc, Research Fellow
Samantha Broadmeadow, BSc, MSc
Anna Brown, BSc, PhD
Andy Brunt
Helen Cariss, BSc, PhD
Eric Casella, BSc, MSc, MSc, PhD
Sylvia Cowdry
Sandra Denman, BSc, MSc, PhD
Kieron Doick, BSc, MRes, PhD
Edward Eaton, BA, MSc
Sarah Green, BSc, PhD
Tony Hutchings, MSc
Daegan Inward, BSc, MSc, PhD
Andrew Jeeves
Lynn Jordan
Susan Kirk
Vicki Lawrence
Bridget Laue, BA, PhD
Grace MacAskill
Simon Marrington
Finlay McAllister, BA, BSc

Roger Moore, BSc, PhD
Alberto Morales, BSc, PhD
James Morison, BSc, PhD
Martin Mullett, BSc, MSc
Jacqui Neal, BSc
Tom Nisbet, BSc, PhD
Lyn Pearce
Mike Perks, BSc, MSc, PhD
Richard Pilgrim, BSc
Rona Pitman, BSc, PhD
Lynn Rooney
David Rose, BA
Joan Rose
Marc Sayce
Nadeem Shah, BSc, MSc, PhD
Heather Steele, BSc
Nigel Straw, BSc, PhD, FRES
Paul Taylor, MA, MSc, MPhil
Huw Thomas, BSc, MSc
Christine Tilbury, BSc
Kath Tubby, MSc, DPhil, MA (Oxon)
Elena Vangelova, BSc, MSc, PhD
David Wainhouse, BSc, MSc, PhD, FRES
Joan Webber, BSc, PhD
Matthew Wilkinson, BSc, MSc
David Williams, BSc, PhD
Georgios Xenakis, BSc, MSc, PhD
Sirwan Yamulki, BSc, MSc, PhD

¹ Seconded from Centre for Forest Resources and Management.

Centre for Forest Resources and Management

Helen McKay, BSc, PhD, MICF, CEnv,

Head of Centre

Lyn Ackroyd

Hazel Andrew

Catia Arcangeli, MSc, PhD

John Armstrong

Cathleen Baldwin

Stephen Bathgate, BSc, BSc, PGDip, MSc

Sue Bellis

Alexander Bowran

Mary Caldwell

David Clark

Lee Cooper

Nicola Corney

Joy Cornwell

Steve Coventry

Ian Craig

Owen Davies, BSc, PhD

James Duff

Janet Dutch, BSc, PhD,

Dai Evans

Trevor Fenning, BSc, PhD

Nick Fielding

John Fonweban, BSc, MSc, PhD

Barry Gardiner, BSc, PhD, FRMetS

Colin Gordon

Richard Hailstones

Sophie Hale, BSc, PhD

Alan Harrison, BSc, MSc

Paul Henshall, BSc

Geoff Hogan, BSc, DPhil

Madge Holmes

Hamish Howell

Steve Howells

Duncan Ireland, BSc

Patricia Jackson

Philip James, BSc

Tom Jenkins, BSc, BSc, FICFor

Richard Jinks, BSc, PhD

Bill J. Jones

Christine Johnstone

Richard Keddle

Andrew Kennedy, BSc

Gary Kerr, BSc, PhD, FICFor, CEnv

Ian Keywood

John Lakey

Steve Lee, BSc, PhD, MICFor

Elspeth MacDonald, BSc, MSc

Ewan Mackie, BSc, MSc

Martin Mackinnon, BSc

Alistair MacLeod

Simon Maskrey

Bill Mason, BA, BSc, DSc, MICFor

Robert Matthews, BSc, MSc

Fraser McBirnie

Stuart McBirnie

Shelagh McCartan, BSc, MSc, PhD

Colin McEvoy,² BA

Shaun Mochan, MSc

Ian Murgatroyd

Calum Murray

Bruce Nicoll, BSc, PhD

Sharon O'Hare

Stephen O'Kane

Alan Ockenden

Margaret O'Donnell

Mark Oram, BSc, MSc

Bill Page

Jim Page

Matt Parratt, BSc

Stefania Pizzirani, BA, MSc

Andrew Price,³ BSc

John Price

Tony Price

Joyce Rammell, BSc

Tim Randle, BSc

Bill Rayner

Anthony Reeves

Liz Richardson

William Riddick

Will Rolls, BSc

Stephanie Roux, MSc

Colin Saunders

Jean Saunders

Gary Servant, BSc

Pauline Simson, BSc

Colin Smart

Victoria Stokes, BSc, MSc, PhD, MICFor

Juan Suárez-Minguez, BSc, MSc

Rob Sykes

Jake Thompson, BSc

Will Thompson, BSc

Ian Tubby, BSc

Paul Turner

Christopher Vials, BSc

Tyrone Waldron

Michael Wall, BSc

Harry Watson

Dave Watterson

Steven Whall

Miriam White, HND, BSc, MSc

Alistair Whybrow, BSc

Duncan Williams

Ian Willoughby, BSc, MBA, FICFor

Christine Woods, BA

² Also with Operations Unit. ³ Seconded to Chief Executive's Office.

Centre for Human and Ecological Sciences

Chris Quine, MA, MSc, FICFor, PhD,

Head of Centre

Stuart A'Hara, BSc, MSc, PhD

Bianca Ambrose-Oji, BSc, MSc, PhD

Russell Anderson, MSc

Helen Armstrong, BSc, PhD

Nadia Barsoum, BSc, PhD

Rebecca Brassey, BSc, MSc

Alice Broome, BSc

Claudia Carter, BSc, MSc

Jordan Chetcuti, BSc

Tom Connolly, BSc, PhD

Robert Coope,⁴ BSc

Joan Cottrell, BSc, PhD

Peter Crow, BSc, MSc

Norman Dandy, BSc, MA, PhD

Colin Edwards, BSc, MSc

David Edwards, BSc, MSc, MSc, PhD

Amy Eycott, BSc, PhD

Mark Ferryman

Robin Gill, BSc, MSc, PhD

Philip Handley, BSc, MSc

Ralph Harmer, BSc, PhD

Steven Hendry, BSc, PhD

Matthew Jollands,⁵ BA, MA

Andrea Kiewitt, BSc, MSc, Dipl-Biol

Anna Lawrence, BA, MSc, PhD

Mariella Marzano, BA, MD, PhD

Brenda Mayle, MSc

Jake Morris, MA, PhD

Darren Moseley, BSc, PhD

Liz O'Brien, BSc, PhD

Andrew Peace, BSc

Michal Petr, BSc, MSc, MSc

Duncan Ray, BSc

Claire Sabin, BA

Sam Samuel, BSc, PhD

Vadims Sarajevs, MSc, MSc, PhD

Roz Shields

Louise Sing, BA, MSc

Mike Smith,⁶ BSc

Amy Stewart, BA, MA, PhD

Philip Taylor, BSc, MSc

Roger Trout, BA, PhD

Gregory Valatin, MA, MPhil, PhD

Tytti Vanhalla, BSc, MSc, PhD

Kevin Watts, BSc, PhD

Operations Unit

Hugh Williams, BA, MSc, PhD, FICFor

Head of Unit

Martin Abrahams

Wayne Blackburn, BSc

Glenn Brearley

Ken Charles, FMS

Jon Davey

Joanne Davies, BSc

Keith Day, BEng

Jane Devlin, BSc, MSc

Anna Duckett

Alec Gaw, BSc

David Georghiou, BA

Wendy Groves

Evelyn Hall

Jason Hubert, BA, MSc, PhD, MICFor

Kirsten Hutchison, MA, DipEd, MSc

Chris Jones, BSc

Martin Jukes, CBiol, MIBiol

Esther Ker

Carol Knight

Timothy Knight, BSc

Belinda Kuenzli

Janet Lacey

Nimisha Limbachia

Carole Martin

Suzanne Martin, MA, PhD

Colin McEvoy,⁷ BA

Jim McGivern

Alison Melvin, BA

Paul Morris

Christopher Mort, BSc, MPhil, LLB

Clive Muller

Catherine Oldham, BA, MA, DipLib, MCLIP

Steve Penny, BSc, MSc

Andrew Phillips

Corinne Russell

Heather Russell

Sally Simpson

Mike Smith⁸

Sandra Smith, ACMA

Shirley Spencer

John Strachan

Sally Taylor

Janet Turner

Anja Ueberjahn-Tritta, BSc, PhD

Ann Williams

Mike Young

⁴ Seconded from Tay Forest District.

⁵ Seconded from Forestry Commission Wales.

⁶ Also with Operations.

⁷ Also with Centre for Forest Resources and Management.

⁸ Also with Centre for Human and Ecological Sciences.

PhD students linked with Forest Research as at 31 March 2010

(The supervisor's name is given alongside each student.)

Steven Adams (Barry Gardiner)
University of Glasgow

Impact of climate change on wood properties of Sitka spruce

Tom Adams (Colin Edwards)
University of Edinburgh

Modelling complexity in native pinewoods

Gail Atkinson (Kieron Doick)
University of Surrey

Land regeneration for greenspace establishment: balancing engineering, environmental and social considerations

Dave Auty (Barry Gardiner)
University of Aberdeen

Scots pine timber quality in Scotland

Kate Beauchamp (Barry Gardiner)
University of Edinburgh

The biology of heartwood formation and its influence on timber quality

Chloe Bellamy
(Brenda Mayle/Kevin Watts)

University of Leeds
How habitat characteristics and structure influence bat species distribution and community structure in the Lake District

Filipa Cox (Nadia Barsoum)
Imperial College London

Are there links between tree health and ectomycorrhizal fungal communities under changing environmental conditions?

Lilla D'Costa (Nigel Straw)
Royal Holloway

Adaption of native natural enemies to an invasive leaf miner

Theresa Hudton (Elena Vanguelova)
University of Exeter

Soil microbial population dynamics and function, and soil carbon fluxes within forest systems as influenced by climate change and increased atmospheric CO₂

Marc Jones (Barry Gardiner)
University of Surrey

Mobile large-scale *in-situ* Magnetic Resonance Imaging of water distribution in wood

Andrew Leslie (Mike Perks)
University of Edinburgh

Eucalypt Energy Forestry

Hamish Mackintosh (Gary Kerr)
University of Edinburgh

Developing the silviculture of continuous cover forestry: using the experience and data collected from the Glentress trial area

Helen Murray (Tom Nisbet)
University of Glasgow

The impact of the Whitelee Wind Farm development on the export of carbon and nutrients to catchment runoff

Emile Mwenge (Elena Vanguelova)
University of Reading

Nutrient budgets in British forest ecosystems

Jenny Owen (Russell Anderson)
University of Stirling

Determinants of field-layer vegetation in plantation restocks: consequences for black grouse conservation

Nalika Rajapaksha (Elena Vanguelova)
University of Lancaster

Soil fauna diversity under short rotation forestry – impacts and responses

Matti Salmela (Joan Cotterell)
University of Edinburgh

Adaptive variation in natural populations of Scots pine in Scotland

Helen Sneath (Tony Hutchings)
University of Surrey

The sustainability of charcoal as an ameliorant in soil remediation

Claire Stevenson (Kevin Watts)
University of Cumbria

Modelling ecological networks and dispersal in the grey squirrel *Sciurus Carolinensis*

James Stratford (Tony Hutchings)
University of Surrey

Use of charcoal for environmental improvements

Eleanor Swain

(Mike Perks/Elena Vanguelova)
University of Newcastle

Carbon turnover in forest and grassland soils – will global warming turn carbon sinks into sources?

Donna Taylor (Anna Lawrence)
University of Cumbria

The effects of woodfuel extraction on woodland birds and butterflies. Can grant funding simultaneously increase renewable energy supply and improve biodiversity?

Jenny Taylor (Mariella Marzano)
University of Oxford

Recreational forest use: developing an agent-based model of tick risk

Armand Tene (Duncan Ray)
University of Dublin

Tree species adaptation to climate change

Emma Thorpe (Elena Vanguelova)
University of Essex

Impact of nitrogen deposition on microbial diversity and function in relation to nitrogen/carbon cycling in different forest soils

Claire Twiddle (Chris Quine)
University of Exeter

Modelling the vegetation history of Inshriach Forest, Cairngorms

Leena Vihermaa (Barry Gardiner)
University of Glasgow

Tree growth influences on wood properties

Antia Villada (Elena Vanguelova)
University of Reading

Evaluation of trees species x soil type interactions for their potential for long term C sequestration

Naomi Vokes (Eric Casella)
University of York

The role of litter priming in deciduous forest soil carbon dynamics