



Publications, research programmes, contracts and people

Forestry Commission technical publications

Publications by Forest Research staff

Major research programmes undertaken by Forest Research

Research contracts awarded by Forest Research

Forest Research people

Forestry Commission technical publications

The following titles were published during the year ending 31 March 2004.

Reports and plans

Forest Research annual report and accounts 2002–2003 (£23.00)

Forest Research corporate plan 2003–06 (free)

Forest Research framework document 2003 (free)

Leaflets and brochures

The quest for sustainable energy: woodfuel meets the challenge (free)

Land reclamation and urban greening: sustainable woodland remediation solutions for multifunctional sites (free)

A code for insect collecting, 3rd edition (free)

The various series of technical publications listed below are published for the Forestry Commission by Sustainable Forestry Group. New titles are listed here as authors are mainly from Forest Research. Authors outwith the Agency are indicated by an asterisk.

Bulletin

126 *Phytophthora disease of alder in Europe*
edited by John Gibbs, Cees van Dijk* and Joan Webber (£16.00)

Conference proceedings, books and reports

Biodiversity in Britain's planted forests: results from the Forestry Commission's Biodiversity Assessment Project edited by Jonathan Humphrey, Richard Ferris and Chris Quine (£10.00).

Crossplan: integrated, participatory landscape planning as a tool for rural development edited by Simon Bell (£12.50).

The silviculture and management of coppice woodlands by Ralph Harmer and Jonathan Howe (£12.00).

The potential of applied landscape ecology to forest design planning: progress in research with special reference to Glen Affric and Sherwood Forest edited by Simon Bell (£19.00).

The restoration of wooded landscapes: proceedings of a conference held at Heriot Watt University, Edinburgh, 14–15 September 2000 edited by Jonathan Humphrey, Adrian Newton, Jim Latham, Helen Gray, Keith Kirby, Elizabeth Poulson and Chris Quine (£17.50).

Guideline

Forests and water guidelines, 4th edition (£9.00)

Information Notes (free)

40 *Transforming even-aged conifer stands to continuous cover management*
revised
Bill Mason and Gary Kerr

48 *Forests, carbon and climate change: the UK contribution*
Mark Broadmeadow and Robert Matthews

- 49 *Red band needle blight of pine*
Anna Brown, David Rose and Joan Webber
- 50 *Growing juniper: propagation and establishment practices*
Alice Broome
- 51 *Forest condition 2002*
Steven Hendry, Roger Boswell and John Proudfoot
- 52 *Breeding hybrid larch in Britain*
Steve Lee
- 53 *Recent changes to the control of forest reproductive material*
Sam Samuel
- 54 *Predicting site suitability for natural colonisation: upland birchwoods and native pinewoods in northern Scotland*
Richard Thompson
- 55 *An indication of the likely volume gains from improved Sitka spruce planting stock*
Steve Lee and Robert Matthews
- 56 *Restoration of neglected hazel coppice*
Ralph Harmer

Inventory Report

National inventory of woodland and trees – Great Britain
Steve Smith and Justin Gilbert (£15.00)

Practice Guides

- 14 *Restoration of native woodland on ancient woodland sites* Richard Thompson, Jonathan Humphrey, Ralph Harmer and Richard Ferris (£9.00)
- 15 *Reducing pesticide use in forestry*
Ian Willoughby *et al.* (£16.00)

Practice Note (free)

4 *Controlling grey squirrel damage to woodlands*
revised
Apr 2003
Apr 2004
Brenda Mayle, Harry Pepper and Mark Ferryman

Sustainable forestry in brief: Factsheets (free)

Woodland and our changing environment

Mark Broadmeadow

Forests and water

Steve Gregory*, Tom Nisbet and Helen McKay*

Forests and flooding

Steve Gregory*, Tom Nisbet and Helen McKay*

Technical Notes (free)

- 5 *Chainsaw debutting of standing timber*
Colin Saunders
- 6 *Respiratory protective equipment*
Bill J. Jones
- 7 *Noise hazards in forestry operations and selection of personal protective equipment*
David H. Jones

Miscellaneous

Involving people in forestry: a toolbox for public involvement in forest and woodland planning
Max Hislop, Mark Twery and Heini Vihemäki (free)

Publications by Forest Research staff

Anderson, A.R. (2003)

Provision and management of open ground in upland forests for biodiversity. A review with special reference to heathlands. MSc dissertation. University of Edinburgh, Edinburgh.

[Bailey, P.J., Woodward, S.] and Pratt, J.E. (2003)

Colonisation and degradation of Sitka spruce sapwood by the Rotstop strain of *Phlebiopsis gigantea*. In: *Root and butt rots of forest trees. Proceedings of IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Bérubé and G. Bussièrès. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 200–205.

[Botha, A.,] Denman, S., [Lamprecht, S.C., Mazzola, M. and Crous, P.W.] (2003)

Characterisation and pathogenicity of *Rhizoctonia* isolates associated with black root rot of strawberries in the Western Cape Province, South Africa. *Australasian Plant Pathology* **32**(2), 195–201.

Brasier, C.M. (2003)

Variation, distribution and pathogenicity of the hybrid alder *Phytophthora* (abstract). In: *Phytophthora in forests and natural ecosystems. 2nd International IUFRO Working Party 7.02.09 Meeting, Albany, Western Australia, 30 September–5 October 2001*, eds J.A. McComb, G.E. St J. Hardy and I.C. Tommerup. Murdoch University Print, Murdoch, Western Australia, 248.

Brasier, C.M. (2003)

Controlling disease: the forest pathologist's viewpoint. In: *Forest biotechnology in Europe: the challenge, the promise, the future*, eds S. McCord and K.M.A. Gartland. Institute of Forest Biotechnology, USA; Scottish Enterprise; Scottish Forest Industries Cluster; Institute of Forest Biotechnology, Research Triangle Park, North Carolina, 25–28.

Brasier, C.M. (2003)

Monitoring the spread and continuing evolution of Dutch elm disease pathogens through ecological and population genetics. In: *APS Annual Meeting, Charlotte, North Carolina, USA, 9–13 August 2003* (abstracts). *Phytopathology* **93**(6) suppl., S106–S107.

Brasier, C.M. (2003)

Sudden oak death: *Phytophthora ramorum* exhibits transatlantic differences. *Mycological Research* **107**(3), 258–259.

Brasier, C.M. and [Jung, T.] (2003)

Progress in understanding *Phytophthora* diseases of trees in Europe. In: *Phytophthora in forests and natural ecosystems. 2nd International IUFRO Working Party 7.02.09 Meeting, Albany, Western Australia, 30 September–5 October 2001*, eds J.A. McComb, G.E. St J. Hardy and I.C. Tommerup. Murdoch University Print, Murdoch, Western Australia, 4–18.

Brasier, C.M., [Cooke, D.E.L., Duncan, J.M. and Hansen, E.M.] (2003)

Multiple new phenotypic taxa from trees and riparian ecosystems in *Phytophthora gonapodyides-P.megasperma* ITS Clade 6, which tend to be high-temperature tolerant and either inbreeding or sterile. *Mycological Research* **107**(3), 277–290.

Brasier, C.M., [Sanchez-Hernandez, E.] and Kirk, S.A. (2003)

Phytophthora inundata sp.nov., a part heterothallic pathogen of trees and shrubs in wet or flooded soils. *Mycological Research* **107**(4), 477–484.

[Brown, A.,] Willoughby, I., [Clay, D.V.,] Moore, R. and [Dixon, F.] (2003)

The use of dye markers as a potential method of reducing pesticide use. *Forestry* **76**(4), 371–384.

[Calder, I.R., Reid, I.,] Nisbet, T.R. and [Green, J.C.] (2003)

Impact of lowland forests in England on water resources: application of the Hydrological Land Use Change (HYLUC) model. *Water Resources Research* **39**(11), SWC6/1–6/10.

Casella, E. and [Sinoquet, H.] (2003)

A method for describing the canopy architecture of coppice poplar with allometric relationships. *Tree Physiology* **23**(17), 1153–1170.

[Clare, J.] and Ray, D. (2003)

A spatial model of Ecological Site Classification for forest management in Britain. In: *4th AGILE Conference, Brno, Czech Republic, 19–21 April 2001, Working Group Meeting 1: Environmental modelling*. AGILE Secretariat, University of Utrecht, The Netherlands, 93–111.

[Coetzee, M.P.A., Wingfield, B.D., Roux, J., Crous, P.W.,] Denman, S. and [Wingfield, M.J.] (2003)

Discovery of two northern hemisphere *Armillaria* species on Proteaceae in South Africa. *Plant Pathology* **52**(5), 604–612.

[Coles, C.F.,] Petty, S.J., [Mackinnon, J.L. and Thomas, C.J.] (2003)

The role of food supply in the dispersal behaviour of juvenile tawny owls (*Strix aluco*). *Ibis* **145**(2), E59–E68(1).

Cooke, D.E.L., Duncan, J.M. and Brasier, C.M. (2003)

The role of hybridization in the origin of new *Phytophthora* species. In: *APS Annual Meeting, Charlotte, North Carolina, USA, 9–13 August 2003* (abstracts). *Phytopathology* **93**(6) suppl., S98.

Cundall, E.P. [Cahalan, C.M.] and Connolly, T. (2003)

Early results of ash (*Fraxinus excelsior* L.) provenance trials at sites in England and Wales. *Forestry* **76**(4), 385–399.

Denman, S., [Crous, P.W., Groenewald, J.Z., Slippers, B., Wingfield, B.D. and Wingfield, M.J.] (2003)

Circumscription of *Botryosphaeria* species associated with Proteaceae based on morphology and DNA sequence data. *Mycologia* **95**(2), 294–307.

Denman, S., [Crous, P.W., Sadie, A. and Wingfield, M.J.] (2004)

Evaluation of fungicides for the control of *Botryosphaeria protearum* on *Protea magnifica* in the Western Cape Province of South Africa. *Australasian Plant Pathology* **33**(1), 97–102.

Edwards, C. and Hall, A.R. (2003)

Direct sowing: conifer tree seeds. *Forestry and British Timber* **32**(4), 33–37.

Evans, H. (2003)

The threat from insect invaders. *Quarterly Journal of Forestry* **97**(4), 271–276.

Evans, H.F. (2004)

Entomology: defoliators. In: *Encyclopedia of forest sciences. Vol. 1: A–L*, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 112–114.

Evans, H.F. and [Speight, M.R.] (2004)

Health and protection: integrated pest management practices. In: *Encyclopedia of forest sciences. Vol. 1: A–L*, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 318–333.

[Foody, G.M., Jackson, R.G.] and Quine, C.P. (2003)

Potential improvements in the characterization of forest canopy gaps caused by windthrow using fine spatial resolution multispectral data: comparing hard and soft classification techniques. Special issue *Forest Science* **49**(3), 444–454.

Gardiner, B. (2004)

Windbreaks and shelterbelts. In: *Encyclopedia of forest sciences. Vol. 4: Tre–Z; Index*, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 1801–1806.

[Gibbs, J.N.] and Webber, J.F. (2004)

Pathology: insect associated tree diseases. In: *Encyclopedia of forest sciences. Vol. 2: M–R*, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 802–808.

[Gilbert, M.,] Fielding, N., Evans, H.F. and [Gregoire, J.-C.] (2003)

Spatial pattern of invading *Dendroctonus micans* (Coleoptera: Scolytidae) populations in the United Kingdom. *Canadian Journal of Forest Research* **33**(4), 712–725.

Gosling, P.G., Samuel, Y.K. and Jones, S.K. (2002)

Successful storage of pretreated, ready-to-sow seeds of *Leucaena leucocephala*. *Journal of Tropical Forest Science* **14**(3), 337–345.

Gosling, P.G., Samuel, Y. and Peace, A. (2003)

The effect of moisture content and prechill duration on dormancy breakage of Douglas fir seeds (*Pseudotsuga menziesii* var. *menziesii* (Mirb.) Franco). *Seed Science Research* **13**(3), 239–246.

Green, S. (2003)

A review of the potential for the use of bioherbicides to control forest weeds in the UK. *Forestry* **76**(3), 285–298.

Hale, S.E. (2003)

The effect of thinning intensity on the below-canopy light environment in a Sitka spruce plantation. *Forest Ecology and Management* **179**(1–3), 341–349.

Hale, S.E., [Levy, P.E.] and Gardiner, B.A. (2004)

Trade-offs between seedling growth, thinning and stand stability in Sitka spruce stands: a modelling analysis. *Forest Ecology and Management* **187**(1), 105–115.

Harmer, R. (2004)

Silviculture: coppice silviculture practised in temperate regions. In: *Encyclopedia of forest sciences. Vol. 3: S–Tre*, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 1045–1052.

Harmer, R. and Robertson, M. (2003)

Seedling root growth of six broadleaved tree species grown in competition with grass under irrigated nursery conditions. In: *Technical, environmental and economic challenges of forest vegetation management; 4th international conference on forest vegetation management: IFVMC4; Nancy, France, 17–21 June 2002*, eds C. Collet and H. Frochot. *Annals of Forest Science* **60**(7), 601–608.

Harrison, A. (2003)

Getting the right mix for self-thinning. Forest and Timber Association (FTA). *Woodland Owner*, December 2003, 4.

Harrison, A. and Rayner, B. (2003)

The use of cultivation for tree establishment. Institute of Chartered Foresters. *The Chartered Forester*, Issue 5/2003, 8–9.

[Hart, T.D.,] Lynch, J.M. and [De Leij, F.A.A.M.] (2003)

Production of *Trichurus spiralis* to enhance the composting of cellulose-containing waste. *Enzyme & Microbial Technology* **32**, 745–750.

[Hemery, G.E., Savill, P.S.] and Kerr, G. (2003)

High pruning for profit. Woodland Heritage. Woodland Heritage, Haslemere, Surrey.

[Hewson, C., Fuller, R.,] Mayle, B. and [Smith, K.] (2004)

Possible impacts of grey squirrels on birds and other wildlife. *British Wildlife* **15**(3), 183–191.

Jinks, R.L. (2003)

Propagation of conifers. In: *Proceedings of the fourth international conifer conference*. *Acta Horticulturae* **615**, 303–307.

Jones, W.J. (2003)

Use and effectiveness of mobile elevating work platforms (MEWPs) for tree work. Prepared by Forest Research for the Health and Safety Executive. Forest Research, Technical Development Branch and Health and Safety Executive. HSE Research Report 123. HSE, Sheffield.

Kerr, G. (2003)

Effects of spacing on the early growth of planted *Fraxinus excelsior* L. *Canadian Journal of Forest Research* **33**(7), 1196–1207.

Kerr, G. (2004)

Plantation silviculture: tending. In: *Encyclopedia of forest sciences*. Vol. 2: M–R, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 837–845.

Kerr, G. and [Cahalan, C.] (2004)

A review of site factors affecting the early growth of ash (*Fraxinus excelsior* L.). *Forest Ecology and Management* **188**(1–3), 225–234.

Kerr, G., Boswell, R. and Mason, B. (2003)

A sampling system to monitor the transformation from even-aged stands to continuous cover. *Forestry* **76**(4), 425–435.

Lee, S. (2003)

Sudden Oak Death threatens. Steve Lee, Forest Research, reports from a meeting in York on Sudden Oak Death. *Forestry and Timber News*, Issue 8, December 2003, 35.

[Lubbe, C.M.,] Denman, S. and [Lamprecht, S.C.] (2003)

Fusarium wilt of *Agathosma betulina* newly reported in South Africa. *Australasian Plant Pathology* **32**(1), 123–124.

Lynch, J.M. (2003)

Plant and microbial diversity: the role of the rhizosphere. In: *Innovative soil plant systems for sustainable agricultural practices*, eds J.M.Lynch, J.S.Schepers and I. Ünver. OECD, Paris, 147–154.

Lynch, J.M. (2003)

Impact of marker and functional genes on soils and plants. In: *Ecological impact of GMO dissemination in agro-ecosystems*, eds T. Lelley, E. Balázs and M. Tepfer. Facultas Verlags und Buchhandels AG, Wien, 25–30.

Lynch, J.M. (2004)

Plant growth-promoting agents. In: *Microbial diversity and bioprospecting*, ed. A.T. Bull. ASM Press, Washington DC, 391–396.

Lynch, J.M. (2004)

Agricultural practices and biodiversity. In: *Agricultural impacts on soil erosion and soil biodiversity: developing indicators for policy analysis*, ed. R. Francaviglia. Istituto sperimentale per la Nutrizione delle Piante, Rome, 101–108.

Lynch, J.M. (2004)

Rhizosphere microbial populations. In: *Encyclopaedia of plant and crop science*, ed. R.M.Goodman. Marcel Dekker, New York, 1090–1093.

MacAskill, G. and [Steele, H.] (2003)

A novel method of collecting and storing *Heterobasidion annosum* basidiospores for use in stump inoculation trials (abstract). In: *Root and butt rots of forest trees. Proceedings of IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Berube and G. Bussieres. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 379.

[McGrady, M.J.,] Petty, S.J., [McLeod, D.R.A.,] Mudge, G. and Bainbridge, I.P.] (2003)

Potential impacts of native woodland expansion on golden eagles (*Aquila chrysaetos*) in Scotland. In: *Birds of prey in a changing environment*, eds D.B.A. Thompson, S.M. Redpath, A.H. Fielding, M. Marquiss and C.A. Galbraith. The Natural Heritage of Scotland 12. Scottish Natural Heritage; Joint Nature Conservation Committee; British Ornithologists' Union. The Stationery Office, Edinburgh, 341–349.

[Marquiss, M.,] Petty, S.J., [Anderson, D.I.K. and Legge, G.] (2003)

Contrasting population trends of the northern goshawk (*Accipiter gentilis*) in the Scottish/English border and North-East Scotland. In: *Birds of prey in a changing environment*, eds D.B.A. Thompson, S.M. Redpath, A.H. Fielding, M. Marquiss and C.A. Galbraith. The Natural Heritage of Scotland 12. Scottish Natural Heritage; Joint Nature Conservation Committee; British Ornithologists' Union. The Stationery Office, Edinburgh, 143–148.

[Martin, S.P., Lamb, D.J.,] Lynch, J.M. and [Reddy, S.M.] (2003)

Enzyme based determination of cholesterol using the quartz crystal acoustic wave sensor. *Analytica Chimica Acta* **487**, 91–100.

[Martin, S.P.,] Lynch, J.M. and [Reddy, S.M.] (2003)

Enhancement of the hydrogen peroxide crystal biosensor using proteins. Eurosensors 03. Gulmores, Portugal.

Mason, W.L. (2003)

Continuous cover forestry: developing close to nature forest management in conifer plantations in upland Britain. *Scottish Forestry* **57**(3), 141–149.

Mason, W.L. (2004)

Plantation silviculture: multiple-use silviculture in temperate plantation forestry. In: *Encyclopedia of forest sciences*. Vol. 2: M–R, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 859–865.

Mason, W.L. and Humphrey, J.W. (2004)

Silvicultural strategies for developing old growth structures in conifer plantations with reference to oceanic climates. *Berichte Freiburger Forstliche Forschung* **47**, 30.

Matthews, R. and Mackie, E. (2004)

Mensuration: Growth and yield. In: *Encyclopedia of forest sciences*. Vol. 2: M–R, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 573–580.

Mayle, B. and [Gurnell, J.] (2004)

Squirrel control in conifers. *Forestry and British Timber* **33**(4), 16–19.

Mochan, S. (2003)

Windblow and timber quality 2. In the second part of his feature, Shaun Mochan, timber quality project manager, Forest Research, Northern Research Station, gives an insight into recent work on the quality of wood in windblown Sitka spruce. *Forestry and British Timber* **32**(4), 16, 18–19.

Moffat, A.J. (2002)

The state of British forests at the beginning of the 21st century. *International Forestry Review* **4**(3), 171–183.

Moffat, A. (2003)

Grounds for optimism. Once dismissed, woodland cover is now encouraged on reclaimed land. *The Chartered Forester* Issue 4/2003, 1213. Institute of Chartered Foresters.

Moffat, A.J. (2003)

Indicators of soil quality for UK forestry. *Forestry* **76**(5), 547–568.

Moffat, A.J. (2004)

Site-specific silviculture: reclamation of mining lands. In: *Encyclopedia of forest sciences*. Vol. 3: S–Tre, eds J. Burley, J. Evans and J.A. Youngquist. Elsevier, Amsterdam, 1078–1085.

Moffat, A.J. and [Laing, J.] (2003)

An audit of woodland performance on reclaimed land in England. *Arboricultural Journal* **27**(1), 11–25.

Moffat, A., Kennedy, F. and Rayner, B. (2003)

The answer lies in the soil! A knowledge of soil type is vital in forestry. Andy Moffat, Fiona Kennedy and Bill Rayner of Forest Research explain why it is important and how accurate assessment can now be made with more ease and confidence. *Forestry and British Timber* **32**(5), 19–20.

Morgan, S.R. (2003)

Keeping on the right track. *Forestry and British Timber* **32**(4), 20–22.

[Morse, A.] and Gardiner, B. (2004)

Understanding wind damage. *Quarterly Journal of Forestry* **98**(1), 55–58.

O'Brien, E.A. (2003)

Public and institutional perspectives on forests and trees: views from Vermont and England. *Scottish Forestry* **57**(2), 73–80.

[Osborne, B., Black, K., Lanigan, G.,] Perks, M. and [Clabby, G.] (2003)

Survival on the exposed limestone pavement in the Burren: photosynthesis and water relations of three co-occurring plant species. *Proceedings of the Royal Irish Academy* **103B**(3), 125–137.

Perks, M.P., [Irvine, J. and Grace, J.] (2004)

Xylem acoustic signals from mature *Pinus sylvestris* during an extended drought. *Annals of Forest Science* **61**(1), 1–8.

Petty, S.J. (2002)

Northern goshawk *Accipiter gentilis*. In: *The migration atlas: movements of the birds of Britain and Ireland*, eds C.V. Wernham, M.P. Toms, J.H. Marchant, J.A. Clark, G.M. Siriwardena and S.R. Baillie. T. and A.D. Poyser, London, 232–234.

Petty, S.J. and [Thomas, C.J.] (2003)

Distribution, numbers and breeding performance of tawny owls (*Strix aluco*) in relation to clear-cutting in a conifer forest in northern England. In: *Birds of prey in a changing environment*, eds D.B.A. Thompson, S.M. Redpath, A.H. Fielding, M. Marquiss and C.A. Galbraith. The Natural Heritage of Scotland 12. Scottish Natural Heritage; Joint Nature Conservation Committee; British Ornithologists' Union. The Stationery Office, Edinburgh, 111–129.



Petty, S.J., [Anderson, D.I.K., Davison, M., Little, B., Sherratt, T.N., Thomas, C.J. and Lambin, X.] (2003)

The decline of common kestrels *Falco tinnunculus* in a forested area of northern England: the role of predation by northern goshawks *Accipiter gentilis*. *Ibis* **145**(3), 472–483.

Pratt, J. and [Thomsen, I.M.] (2003)

Pathogenicity of Rotstop to Sitka spruce in Britain (abstract). In: *Root and butt rots of forest trees. Proceedings of IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Berube and G. Bussieres. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 380.

Pratt, J.E., Brooks, D.J. and Lipscombe, M.A. (2003)

Improving stump treatment by harvesting machine. In: *Root and butt rots of forest trees. Proceedings of IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Berube and G. Bussieres. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 139–144.

Redfern, D.B. and Boswell, R.C. (2004)

Assessment of crown condition in forest trees: comparison of methods, sources of variation and observer bias. *Forest Ecology and Management* **188**(1–3), 149–160.

[Robinson, M., Cognard-Plancq, A.-L., Cosandey, C., David, J., Durand, P., Fuhrer, H.-W., Hall, R., Hendriques, M.O., Marc, V., McCarthy, R., McDonnell, M., Martin, C.,] Nisbet, T., [O’Dea, P., Rodgers, M. and Zollner, A.] (2003)

Studies of the impact of forests on peak flows and baseflows: a European perspective. *Forest Ecology and Management* **186**(1–3), 85–97.

[Slippers, B., Crous, P.W.,] Denman, S., [Coutinho, T.A., Wingfield, B.D. and Wingfield, M.J.] (2004)

Combined multiple gene genealogies and phenotypic characters differentiate several species previously identified as *Botryosphaeria dothidea*. *Mycologia* **96**(1), 83–101.

[Speight, M.R.] and Evans, H.F. (2004)

Health and protection: integrated pest management principles. In: *Encyclopedia of forest sciences. Vol. 1: A–L*, eds J. Burley, J. Evans and J. A. Youngquist. Elsevier, Amsterdam, 305–318.

[Strati, S., Patino, S., Slidders, C.,] Cundall, E.P. and [Mencuccini, M.] (2003)

Development and recovery from winter embolism in silver birch: seasonal patterns and relationships with the phenological cycle in oceanic Scotland. *Tree Physiology* **23**(10), 663–673.

Suárez, J., Evans, S., Randle, T., Henshall, P., Houston, T., Gardiner, B. and Dunham, R. (2003)

The development of a generic framework for model integration in forest management. The UK Forestry Commission CoreModel programme. In: *4th AGILE Conference, Brno, Czech Republic, 19–21 April 2001, Working Group Meeting 1: Environmental modelling*. AGILE Secretariat, University of Utrecht, The Netherlands 79–92.

Suárez, J., Smith, S. and [Ditchburn, B.] (2003)

The use of GIS in forestry. *Quarterly Journal of Forestry* **97**(4), 265–270.

Tabbener, H.E. and Cottrell, J.E. (2003)

The use of PCR based DNA markers to study the paternity of poplar seedlings. *Forest Ecology and Management* **179**(1–3), 363–376.

Thompson, R.N. and [Watson, S.] (2003)

No fence planting – a lesson from Wales. *Reforestation Scotland*, Issue 29, Spring 2003, 33–35.

[Thomson, A.J.] and Willoughby, I. (2004)

A web-based expert system for advising on herbicide use in Great Britain. *Computers and Electronics in Agriculture* **42**, 43–49.

[Usher, M.B.] and Humphrey, J.W. (2003)

The pine forests of Glen Affric: the diversity of their arachnids. *Scottish Forestry* **57**(3), 133–140.

Wainhouse, D., Boswell, R. and Ashburner, R. (2004)

Maturation feeding and reproductive development in adult pine weevil, *Hylobius abietis* (Coleoptera: Curculionidae). *Bulletin of Entomological Research* **94**(1), 81–87.

Webber, J.F. (2003)

Sudden oak death. Joan Webber assesses how a new fungal disease could affect trees in the UK. *Smallwoods* Issue 11, Summer 2003, 10–11. Small Woods Association.

Webber, J.F. (2003)

Detection, identification and genetics of exotic fungal pathogens. In: *APS Annual Meeting, Charlotte, North Carolina, USA, 9–13 August 2003*. APS Meeting abstracts. *Phytopathology* **93**(6) suppl., S118–S119.

Webber, J. and Thorpe, K. (2003)

Potential for biological control of *Heterobasidion annosum* in the UK using Rotstop (R). In: *Root and butt rots of forest trees. Proceedings of the IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Berube and G. Bussieres. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 221–225.

Williams, D.T., Straw, N.A. and Day, K.R. (2003)

Defoliation of Sitka spruce by the European spruce sawfly, *Gilpinia hercyniae* (Hartig): a retrospective analysis using the needle trace method. *Agricultural and Forest Entomology* **5**(3), 235–245.

[Williams, H. (compiler)]; Claridge, J. ed., (2003)

Create a farm woodland: a toolkit to help you plan and plant. From experiences in The National Forest. The National Forest Company, Swadlincote, Derbyshire.

Willoughby, I. (2004)

Reducing pesticide use in forestry. *Forestry and British Timber* **33**(2), 32.

Willoughby, I. (2004)

Using colour to protect woodlands. Ian Willoughby explains how dye markers might be used to reduce pesticide use in woodlands. *The Colourist*, Issue 1, Spring 2004, 6.

Willoughby, I. and [Thomson, A.] (2004)

Expert help on herbicide selection. *Forestry and British Timber* **33**(2), 30.

[Wood, M.J., Carling, P.A.] and Moffat, A.J. (2003)

Reduced ground disturbance during mechanized forest harvesting on sensitive forest soils in the UK. *Forestry* **76**(3), 345–361.

[Woodward, S.], Pratt, J.E., [Pukkala, T., Spanos, K.A., Nicolotti, G., Tomiczek, C., Stenlid, J., Marcais, B. and Lakomy, P.] (2003)

MOHIEF: Modelling of *Heterobasidion* in European forests, a EU-funded research program. In: *Root and butt rots of forest trees. Proceedings of IUFRO Working Party 7.02.01, Quebec City, Canada, 16–22 September 2001*, eds G. Laflamme, J.A. Berube and G. Bussieres. Canadian Forestry Service, Laurentian Forest Research Centre, Canada. Information Report LAU-X-126. CFS, Sainte-Foy, Quebec, 423–427.



Major research programmes undertaken by Forest Research

Programmes funded by the Forestry Commission

Entomology Branch

Plant health

Hugh Evans, Nick Fielding and Christine Tilbury

Research into the risks from indigenous and non-indigenous forest insect species. 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 contingency options for potential pests. Research into alternatives to methyl bromide as a quarantine and remedial treatment against exotic pests (part EU-funded).

Restocking pests

Stuart Heritage

Research into the effective use of chemical pesticides for control of restocking pests, notably *Hylobius abietis*. Research into and development of insect parasitic nematodes for biological control of larval stages in stumps and provide direct intervention options within the Integrated Forest Management programme being developed in the Branch.

Impact of insects on tree growth

Nigel Straw

Investigate quantitative relationships between insect population pressure and the growth of trees attacked by those insects. An important aim is to separate the direct effects of damage from other biotic and abiotic variables that might mask the impacts of pest insects. The target species is green spruce aphid, *Elatobium abietinum*, which severely defoliates both Norway and Sitka spruces.

Integrated Forest Management

David Wainhouse, Roger Moore and Hugh Evans

Develop the concepts and science of Integrated Forest Management (IFM) to underpin sustainable forestry with particular emphasis on reductions in chemical pesticides. Study the population dynamics of *Hylobius abietis* and use the data to develop decision support systems for management of the restocking problem. Investigate the variability in quality of both stumps and transplants in relation to performance of *H. abietis* and use the data to refine management options within the IFM programme. Develop a decision support system for sustainable reduction of *H. abietis* populations towards the acceptable damage threshold predicted by the population dynamics models.

Mechanisms of tree resistance to insect attack

David Wainhouse

Investigate mechanisms of resistance of young conifers to the pine weevil. Determine the relative importance of genetic and environmental factors in resistance expression. Develop these aspects to contribute to an Integrated Forest Management (IFM) approach for control of pine weevil.

Advisory services

Christine Tilbury

Provide identification services for both pest and beneficial insects and provide advice on pest management and control.

Environmental Research Branch

Soil sustainability

Fiona Kennedy and Elena Vanguelova

Research to identify and evaluate the potential impacts of both forest management and air pollution on soil status and dynamics. Develop and advise upon sustainable practices.

Reclamation of man-made sites for forestry

Andy Moffat, Kirsten Foot and Tony Hutchings

Improve methods of establishing woodland and management practices on disturbed (brown field) sites, taking into account changes in forestry and land-use policy, planting opportunity, environmental impacts, mining practices and technology. Develop best practice guidelines.

Forest hydrology

Tom Nisbet

Study the impacts of forests and forestry management practices on water quality and quantity. Develop and assess guidance on best management practice for the protection of the freshwater environment within forests. Provide expert advice on forestry-water issues.

Effects of air pollution on trees

Dave Durrant and Andy Moffat

Determine the role of air pollution in forest condition and growth through long-term intensive environmental monitoring in forest ecosystems, in compliance with EC regulations. Provide data under the Convention on Transboundary Air Pollution for the calculation and mapping of critical loads.

Climate change

Mark Broadmeadow

Predict and model the impacts of climate and wider environmental change on tree growth by experimental work in open-top chambers and in forest stands. Interpret published climate change scenarios and develop guidance on future species suitability, both for production woodland management and native woodland restoration. Identify interactions between forests, woodland management and the changing global environment.

Carbon

Mark Broadmeadow

Develop a network for monitoring carbon stocks and stock changes of woodland in the UK. Maintain one of only three long-term carbon flux monitoring stations in woodland in the UK, measuring carbon fluxes and constructing a carbon budget for a stand of lowland broadleaf woodland. Research the contribution that wood (including bioenergy production) and wood products can make to climate change mitigation.

Environmental change network

Sue Benham

Monitor and understand environmental change and its impact on terrestrial ecosystems. Manage one of the national ECN terrestrial sites.

Historic environment

Peter Crow

Develop methods, tools and guidance to aid the day to day management of historic environment features such as archaeological evidence, veteran trees and historic woodlands/landscapes.

Mensuration Branch

Sample plots

John Proudfoot

Develop and maintain national reserve of periodic growth and yield data to support measurement, growth and yield studies using a network of permanent and temporary sample plots. Current focus: contemporary silvicultural practices, uneven-aged planting mixtures, modern planting and harvesting systems, long-term environmental change monitoring.

Yield models

Robert Matthews

Improve methods and models for forecasting growth and yield of forests. Current focus: development of interactive stand-level yield model software, site:yield relationships, biomass yield models.

Measurement

Ewan Mackie

Develop and promote measurement systems and instruments for the accurate and efficient measurement of trees and timber to support industry, national and international standards. Provide independent expert advice in cases of measurement dispute.

Core model

Sam Evans

Integrate modelling initiatives within Forest Research by developing a framework of existing and new models and relevant datasets. Taking growth models as a starting point, the core model programme aims to provide modelling tools at appropriate scales of resolution to support and promote the implementation of multi-purpose sustainable forestry policy in the UK.

Pathology Branch

Tree diseases: diagnosis and provision of advice

David Rose and Sarah Green

Diagnose disease in trees and provide advice and information on disease identification, management and control. Provide information on decay in standing trees, and on management of veteran trees.

Tree health monitoring

Steven Hendry

Monitor the health of the nation's trees and raise awareness of tree health issues.

Risks from altered pathogens

Clive Brasier

Investigate changes in pathogen behaviour and evaluate the potential impact of such changes in relation to plant health and Pest Risk Analysis.

Non-chemical protection

Joan Webber

Research and evaluate the potential for biological control of tree diseases, with special emphasis on root rot pathogens and the fungi that cause vascular wilts and stain and decay.

Fomes root and butt rot of conifers

Katherine Thorpe

Conduct research on root and butt rot of conifers caused by *Heterobasidion annosum* and investigate approaches to management and control.

Phytophthora diseases of trees

Clive Brasier, Joan Webber and Sandra Denman

Investigate pathogenic *Phytophthora* species of alder and oak to determine their impact and the opportunities for management and control.

Silviculture (North) Branch

Integrated establishment systems for the uplands

Alan Harrison, Mike Perks and Colin McEvoy

Integrated studies of the effect of nursery practice, seedling physiology, plant handling methods, site preparation and maintenance upon tree establishment.

Silvicultural effects upon timber quality

Barry Gardiner, Jason Hubert, Elspeth Macdonald and Shaun Mochan

Investigate the impact of silvicultural practices on timber quality in conifers, especially spruce. Main emphasis is impact of site factors (e.g. exposure, fertility) on quality.

Silviculture of upland native woodlands

Richard Thompson and Colin Edwards

Research into the structure, dynamics and silviculture of native woodland ecosystems in northern and western Britain to support restoration and extension for ecological and economic benefits. Emphasis is on Scots pine forests, birchwoods and the Atlantic oakwoods.



Alternative silvicultural systems in conifer forests

Bill Mason, Colin Edwards and Sophie Hale

Evaluate canopy structure manipulation to promote suitable microclimates for seedling establishment and facilitate natural regeneration to enable wider use of alternative silvicultural systems to patch clearfelling (continuous cover forestry).

Stability of stands

Barry Gardiner, Bruce Nicoll, Alexis Achim and Juan Suárez

Research to reduce wind damage to British forests using a GIS-based windthrow risk model for predicting the probability of windthrow in Sitka spruce forests. Carry out studies of root development and architecture in support of the model.

Remote sensing

Juan Suárez

Evaluate the potential of remote sensing techniques for operational use in British forest management.

Silviculture and Seed Research Branch

Alternative establishment systems

Ian Willoughby and Richard Jinks

Investigate alternatives to conventional establishment systems for new planting and regenerating existing woodlands, including vegetation management, reducing synthetic chemical inputs and direct seeding.

Energy coppice and poplar research

Ian Tubby

Investigate dry matter yields of willow and poplar coppice grown for renewable energy.

Lowland native woods

Ralph Harmer

Examine methods for managing, regenerating and extending lowland native woodlands.

Silvicultural systems

Gary Kerr

Examine the potential for diversifying the range of silvicultural systems used in native woodlands.

Seed and seedling biology

Peter Gosling and Richard Jinks

Improve tree seed quality and performance to reduce costs and increase reliability of direct seeding and natural regeneration.

Social research unit (inter-Branch)

Paul Tabbush and Elizabeth O'Brien (SSRB, Alice Holt), Max Hislop and Suzanne Martin (Silv(N), NRS)

Examine relationships between communities and woodlands in support of FC policies on sustainable forest management. Work concentrates on community involvement, publicly held values, health and well-being, criteria and indications of sustainability, recreation, access and rural development.

Technical Development Branch

Large-scale forestry harvesting

Colin Saunders

Evaluate machinery and equipment, produce output guidance and investigate operational techniques relevant to large-scale forestry work in harvesting.

Large-scale ground preparation, seed sowing and planting

Steve Morgan, Andy Hall and Bill J. Jones

Evaluate machinery and equipment, produce output guidance and investigate operational techniques relevant to large-scale forestry work in ground preparation and planting.

Farm and small-scale silviculture/harvesting and utilisation of small woodlands

Andy Hall

Develop methods and assess equipment with low environmental impact suitable for use in small, generally broadleaved woodlands, and suitable for use by farmers and small contracting firms.

Forestry operations on derelict and reclaimed land

Bill J. Jones

Undertake focused research into the cost-effectiveness of restoration techniques, with an emphasis on system and cost advice on techniques recommended by scientists.

Wood for energy

Andy Hall and Paul Webster

Develop methods for using short rotation coppice, single-stemmed short rotation forestry, forestry residues and existing undermanaged woodlands for small-scale heating and small- or large-scale electricity generation.

Chemical weeding

Bill J. Jones

Evaluate equipment, application techniques and safety.

Reduction in the use of chemicals

Bill J. Jones and Paul Webster

Examine equipment and methods that offer opportunities for non-chemical weed control.

Health and safety

Bill M. Jones and Colin Saunders

Review techniques and procedures for management of health and safety of machine operators.

Tree Improvement Branch

Selection and testing of conifers

Steve Lee

Undertake plus-tree selection, progeny testing. Breeding/production populations. Demonstration of realised gain. Development of techniques for marker aided selection. Species: Sitka spruce, Scots pine, Corsican pine, Douglas fir, larch.

Breeding and production of conifers

Steve Lee

Clonal archives: conservation, advanced breeding material. Improved seed: controlled pollination, seed orchards.

Improvement of broadleaves

Ned Cundall

Selection/testing of selections at population, family and clonal level: oak, ash, sycamore, beech, birch.

Origin and provenance of conifers

Sam Samuel

Identification of suitable origins of conifer species. Key species: Sitka spruce, Douglas fir.

Genetic conservation

Joan Cottrell

Study of genetic variation and gene flow in natural populations. Assessing the level of adaptive variation in the field trials of populations of native species.

In vitro propagation and phase-change biotechnologies

Allan John

Investigate tissue culture systems for multiplication of Sitka spruce.

Forest Reproductive Material Regulations

Sam Samuel

Devise methods for inspection of material proposed for registration. Maintain the National Register of Basic Material.

Woodland Ecology Branch

Biodiversity evaluation and indicators

Jonathan Humphrey

Synthesise datasets from the biodiversity assessment project, identify potential biodiversity indicators, and disseminate findings.

Forest habitat management

Jonathan Humphrey, Russell Anderson and Helen Armstrong

Investigate and provide guidance on the management of forests for biodiversity through developing old growth stands, utilising cattle grazing and managing open ground habitats.

Species Action Plans

Alice Broome, Roger Trout, Chris Quine and Brenda Mayle

Undertake research in support of Forestry Commission commitments to the species Biodiversity Action Plans and provide advice on appropriate management of woodland habitats for these species.

Landscape ecology

Kevin Watts and Chris Quine

Improve understanding of how biodiversity responds to management at the landscape scale, and translate this into practical management guidance for forest design.

Ecological site classification and decision support systems

Duncan Ray

Research, build and test models that predict the effect of forest management on forest ecology, and develop decision-making tools for ecological site classification and forest biodiversity.

Squirrel management

Brenda Mayle

Develop cost-effective means of managing the impact of grey squirrels on timber production. Investigate the impact of grey squirrels on woodland biodiversity.

Deer population ecology and management

Robin Gill, Helen Armstrong and Brenda Mayle

Provide a sustainable basis for deer management in UK woodlands by investigating and developing new techniques and models of impacts and damage, population dynamics of deer, and deer density assessment.

Tree protection

Roger Trout

Develop techniques and materials for cost-effective protection of trees and woodlands from vertebrate damage.

Woodland Surveys Branch

National inventory of woodland and trees

Steve Smith

Undertake the FC national survey of woodland and trees, assessing the woodland cover. Update key statistics on forest type, species, age-class, management and ownership.

Inventory GIS development

Graham Bull

Create the digital woodland map for Britain. Develop the use of GIS for providing spatially referenced data on the woodland cover of Great Britain.

Private sector production forecast

Justin Gilbert

Develop and produce the private sector production forecast incorporating new woodland data from the national inventory.

Programmes funded by the European Commission

Application of cDNA Microarray Technology for unravelling molecular events underlying dormancy and cold hardiness in forest tree seedlings.

Ash for the future: defining European ash populations for conservation and regeneration.

Compression wood in conifers.

Demonstration of sustainable forestry to protect water quality and aquatic biodiversity.

Mechanised logging operations.

Development of improved pest risk analysis techniques for quarantine pests, using pinewood nematode *Bursaphelenchus xylophilus* in Portugal as a model system.

Eco-engineering and conservation of slopes for long-term protection from erosion, landslides and storms.

Forecasting the dynamic response of timber quality to management and environmental change.

Forest condition surveys.

Gene flow in oaks.

Improving ash productivity for European needs by testing selection, propagation and promotion of improved genetic resources.

Integrating ecosystem function into river quality assessment and management.

Intensive monitoring of forest ecosystems.

Modelling of *Heterobasidion* infection in European forests.

Phytophthora in European oak decline.

Urgent conservation management for Scottish capercaillie.

Upgrading the Level II protocol for physiological modelling of cause-effect relationships: a pilot study.

Visualisation tools for public participation in the management of landscape change.

Risk analysis for *Phytophthora ramorum*.

Timber cladding, northern periphery.

Programmes funded by individual organisations

CCW/FCW

Woodland habitat network strategy for Wales.

Department for the Environment, Food and Rural Affairs

Development of site-specific yield model for ash in lowland England and Wales.

Species boundaries on Phytophthora.

Yield models for energy coppice of poplar and willow.

Department for the Environment, Food and Rural Affairs/Loughborough University

Trees and drought in lowland England.

Department for the Environment, Food and Rural Affairs/Natural Environment Research Council

Cause-effect relationships for pollutant inputs to UK woodland ecosystems.

Department of Trade and industry

Yield models for energy coppice of poplar and willow.

EC/Highland Birchwoods

Conservation of native oakwoods.

EC/Scottish Natural Heritage

Restoration of wet woods.

English Nature

Woodland restoration – comparison of inventory data.

Environment Agency

CCF – environmental good practice.

Phytophthora disease of alder.

EPSRC/Sheffield

Urban greening.

Novel compost.

Climate change.

Health and Safety Laboratories

Vibration exposure of chainsaw operators.

ITE

Terrestrial effects of acid pollutants.

UK emissions by sources.

Madeira National Park

Mammal control.

Natural Environment Research Council/Imperial College

Variation in the Dutch elm disease pathogens.

Terrestrial carbon dynamics.

Office of the Deputy Prime Minister

Monitoring the health of non-woodland trees.

Raleigh International

Huemul ecology research for the conservation planning in Southern Chile.

Scotland and Northern Ireland Forum for Environmental Research

A coupled soil-forest-atmosphere dynamic model for predicting evapotranspiration demands at the plot and landscape scales in the UK.

Scottish Forestry Trust/UK Forest Products Association/Tilhill Economic Forestry/Scottish Woodland Owners Association

Assessing log quality in Sitka spruce.

Scottish Natural Heritage

Balancing upland and woodland strategic priorities.

Forest habitat network.

Testing methods for monitoring beaver impacts on terrestrial vegetation in Knapdale.

Red squirrel habitat mapping.

SCRI

Woodcore samples.

Sheffield University

CTCD data management.

Southampton University

Short rotation coppice (poplar).

USDA

Phytophthora ramorum.

Woodland Trust

Weed control using non-chemical methods.



Research contracts awarded by Forest Research

Avon Vegetation Research

Forestry herbicide evaluation.

Butterfly Conservation

Study of small pearl-bordered fritillary populations in Clocaenog Forest.

Cranfield University, BHR Group

Development and production of prototype systems to separate insect parasitic nematodes from rearing media.

Environment Agency (Wales)

Effects of forestry on surface water acidification.

Fountain Forestry

Water monitoring, Halladale.

Freshwater Fisheries Laboratory

Effects of riparian forest clearance on fish populations.

Imperial College, London

Control of decay in utility poles.
Development of a biological control agent for Dutch elm disease.
Conservation of Xylophagous beetles and their parasitoids in Britain's woodlands.

Macaulay Land Use Research Institute

Sustainability of afforestation development, Halladale.

Mountain Environments

Investigation of the long-term effects of forest management on upland catchments (Balquhidder).

Scottish Environment Protection Agency

Effects of forestry on freshwater fauna.

University of Abertay, Dundee

Cryopresentation of Sitka spruce tissues.

University of Birmingham

Woody debris in forest aquatic habitats.

University of Bristol

Use of landscape features and habitats by lesser horseshoe bats: management implications.

University of Leeds

Atmospheric boundary layer over forests.
Chemical transport in forests.

University of Reading

Tree root response to acidification.
Soil variability.
Soil quality indicators in forestry.

University of Southampton

Water and fine sediment transport in rivers with wooded floodplains.
Molecular studies of quantitative traits in Sitka spruce.

University of Stirling

Habitat use of working forest by capercaillie.
Paleoecology of Glen Affric.
Identification and analysis of spider samples obtained from Forest Research's Biodiversity Assessment plots.

University of Sussex

Biochemical mechanisms for plants to act as sinks for atmospheric pollutants.
Drought tolerance in poplars.

University of Ulster

Feeding ecology of the large pine weevil.
Impact of defoliating insects on forests.

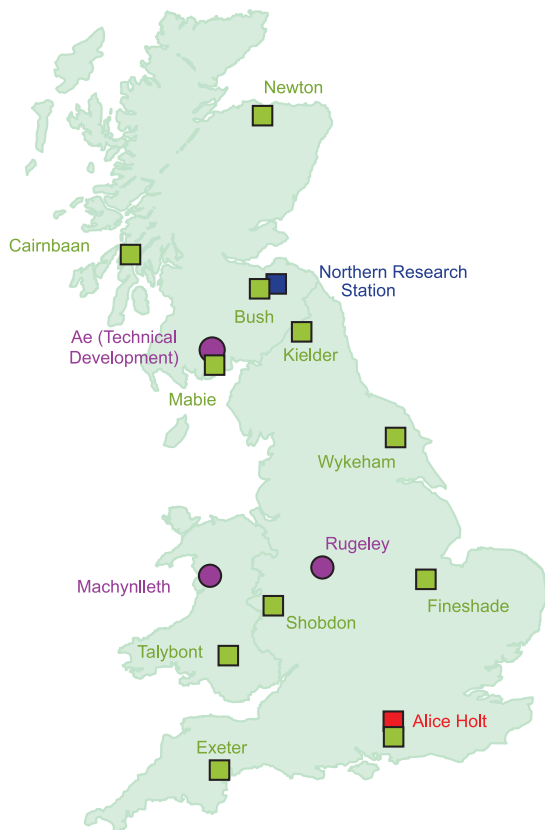
University of York

Carbon stocks in UK soils and their vulnerability to climate change.

Forest Research people

Staff as at 31 March 2004, in Branches, Sections and Technical Services based at:

- **Alice Holt**
- **Northern Research Station**
- **Ae Village, Midlands and Wales**
- **Field Stations**



Chief Executive

- Jim Lynch, BTech, PhD, DSc, CSci, CChem, FRSC, CBIol, FIBiol, FIBiotech, FRSA

Chief Research Officer

- Peter Freer-Smith, BSc, PhD, DSc

Personal Secretaries

- Claire Holmes*
- Sue Jones, BA, MA*
- Sue Stiles

Head of Northern Research Station

- Bill Mason, BA, BSc, MICFor

Personal Secretary

- Madge Holmes

Since June 2004 the new FR structure shown on page 2 has been in place.

*Denotes part-time.

Administration Branch

- Ken Charles, FMS, *Personnel and Administration Officer, Head of Branch*

Central Services

- Mike Wheeler
- Mandy Sennett*
- Amanda Smith*
- Bevan Stephens
- Mike Young

Personnel

- Wendy Groves
- Janet Lacey
- Calum Gordon

Typing

- Sally Simpson*
- Heather Russell*

Administration, NRS

- Martin Abrahams, *Head of Section*
- Gerry Cockerell
- Evelyn Hall
- Esther Ker
- Heather Edmonds*
- Linda Legge*
- Roz Shields*

Finance and Planning Branch

- Tony Cornwell, FCMA, *Head of Branch*
- Gilly Anderson*
- Laura Caless
- Peter Filewood
- David Georghiou, BA
- Carol Knight*
- Carole Martin
- Alison Melvin, BA
- Janet Turner

Communications Branch

Photography and Publications

- George Gate, *Head of Section and Acting Head of Branch*
- Glenn Brearley
- Jenny Claridge, BSc, ARCS
- Sally Taylor (*also with Library and Information*)
- John Williams

Library and Information

- Catherine Oldham, BA, MA, DipLib, MCLIP, *Head of Section and Librarian*
- Eleanor Harland, MA, DipLib, *Assistant Librarian*
- Kirsten Hutchison, MA
- Thelma Smalley*

Entomology Branch

- Hugh Evans, BSc, DPhil, FRES, *Head of Branch*
- Sara Brough, BSc
- Gillian Green, BSc*
- Martin Jukes, CBiol, MIBiol
- Shirley Stephens*
- Nigel Straw, BSc, PhD, FRES
- Christine Tilbury, BSc
- David Wainhouse, MSc, PhD, FRES
- Stuart Heritage, MBA, CBiol, MIBiol, *Head of Section*
- Roger Moore, BSc, PhD

Environmental Research Branch

- Andy Moffat, BSc, PhD, *Head of Branch*
- Lorraine Adams, BSc
- Sue Benham, BSc
- François Bochereau, BSc, MSc
- Caroline Kilbride, BSc
- Mark Broadmeadow, BSc, PhD
- Samantha Broadmeadow, BSc, MSc
- Sylvia Cowdry*
- Peter Crow, BSc, MSc
- Dave Durrant, BA
- Kirsten Foot, BSc, MSc, EngD
- Tony Hutchings, MSc
- Elizabeth Luttrell, BSc (*also with Woodland Ecology Branch*)
- Anthea McRiley, BSc
- Tom Nisbet, BSc, PhD
- Rona Pitman, BSc, PhD
- Geoffrey Sellers, BSc, MSc, PhD
- Danielle Sinnett, MSc
- Hugh Thomas, BSc, MSc
- Ernest Ward, BSc, MSc, CChem, MRSC
- Elena Vanguelova, BSc, MSc, PhD
- Rene van Herwijnen, MSc, PhD
- Christine Whitfield*
- Matthew Wilkinson BSc, MSc

Mensuration Branch

- Professor Sam Evans, MA, PGDip, PhD, PhD, *Head of Branch*
- Catia Arcangeli, MSc, PhD
- Miriam Baldwin, HND, BSc, MSc
- June Bell
- Eric Casella, MSc, PhD
- Tim Cooper
- Ian Craig
- Cecile De Munck, BSc, MSc
- Paul Henshall, BSc
- Tracy Houston, BSc, MIS
- Ewan Mackie, BSc, MSc
- Robert Matthews, BSc, MSc
- John Proudfoot
- Tim Randle, BSc
- Marc Sayce
- Paul Taylor, MA, MSc, MPhil

*Denotes part-time.

Pathology Branch

- Joan Webber, BSc, PhD, *Head of Branch*
- Professor Clive Brasier, BSc, PhD, DSc, Emeritus
- Anna Brown, BSc, PhD
- Sandra Denman, BSc, MSc, PhD
- Anthony Jeeves
- Susan Kirk
- Carol Lishman*
- Elizabeth Orton, BA, MSc
- David Rose, BA
- Joan Rose
- Katherine Thorpe, BA, MSc, DPhil
- Sarah Green, BSc, PhD, *Head of Section*
- Steven Hendry, BSc, PhD
- Grace MacAskill
- Heather Steele, BSc*

Silviculture & Seed Research Branch

- Paul Tabbush, BSc, MSc, FICFor, *Head of Branch*
- Vicky Cunningham, BSc
- Peter Gosling, BSc, PhD
- Ralph Harmer, BSc, PhD
- Lorelie Ives
- Andrea Kiewitt, BSc, MSc
- Richard Jinks, BSc, PhD
- Gary Kerr, BSc, FICFor, PhD
- Liz O'Brien, BSc, PhD
- Matt Parratt, BSc
- Victoria Stokes, BSc, PhD
- Ian Tubby, BSc
- Ian Willoughby, BSc, MBA, MICFor
- Christine Woods, BA

Silviculture North Branch

- Bill Mason, BA, BSc, MICFor, *Head of Branch*
- Julie Barrette, BSc, MSc*
- Alexis Achim, BSc
- Stephane Berthier, PhD
- Colin Edwards, BSc
- Professor Barry Gardiner, BSc, PhD, FRMetS
- Sophie Hale, BSc, PhD
- Alan Harrison, BSc
- Max Hislop, MICFor
- Elspeth Macdonald, BSc, MSc
- Colin McEvoy, BA
- Suzanne Martin, BSc, PhD
- Shaun Mochan, MSc
- Bruce Nicoll, BSc
- Mike Perks, BSc, MSc, PhD
- Stephen Smith, BSc, MICFor
- Juan Suárez-Minguez, BSc, MSc
- Richard Thompson

KEY: ■ Alice Holt ■ Northern Research Station ● Ae, Midlands and Wales ■ Field Stations

Statistics and Computing Branch

- Jane Smyth, BSc, *Head of Branch*
- Carol Foden*
- Dai Jeffries, BSc
- Dan Johnson, BSc
- Timothy Knight, BSc
- Geoff Morgan, BSc, MSc, PhD
- Jane Poole, BSc, MSc
- Lyn Pearce*
- Chris Vials, BSc
- Wayne Blackburn, BSc, *Head of Section*
- Stephen Bathgate, BSc, BSc, PGDip
- Lynn Connolly*
- Tom Connolly, BSc, PhD
- Alec Gaw, BSc*
- Alvin Milner, BSc, PhD
- Andrew Peace, BSc
- Lynn Rooney*

Tree Improvement Branch

- Sam Samuel, BSc, PhD, *Head of Branch*
- Stuart A'Hara, BSc, MSc, PhD
- Cathleen Baldwin
- Joan Cottrell, BSc, PhD
- Ned Cundall, BSc, PhD
- Jason Hubert, BSc, PhD
- Allan John, BSc, PhD
- Steve Lee, BSc, PhD, MICFor
- Margaret O'Donnell*
- Rob Sykes

Woodland Ecology Branch

- Chris Quine, MA, MSc, MICFor, PhD, *Head of Branch*
- Russell Anderson
- Helen Armstrong, BSc, PhD
- Alice Broome, BSc
- Tracy Brown, BSc, MSc
- Jonathan Humphrey, BSc, PhD
- Liz Poulosom, MSc
- Duncan Ray, BSc
- Louise Sing, BA, MSc
- Brenda Mayle, MSc, *Head of Section*
- Andy Brunt
- Mark Ferryman
- Robin Gill, BSc, MSc, PhD
- Matthew Griffiths, BSc, MSc
- Elizabeth Luttrell, BSc (*also with Environmental Research Branch*)
- Roger Trout, BA, PhD
- Kevin Watts, BSc, PhD

Technical Development Branch

- Bill Jones, *Head of Branch*
- Bill J. Jones
- Steve Morgan
- Derry Neil
- Norma Nicholson*
- Joyce Rammell, BSc
- Colin Saunders
- Aileen Wallace*

Midlands

- Andy Hall
- Duncan Ireland, BSc
- Martin Lipscombe
- Paul Webster

Wales

- David Jones, EngTech, AMIAgrE

Woodland Surveys Branch

- Steve Smith, BSc, BA, MBA, *Head of Branch*
- Graham Bull
- Christine Brown
- Justin Gilbert, BSc
- Shona Cameron
- Esther Whitton

Field Stations

Technical Services (North)

- Kate Fielding, *Head of Branch*

Engineering Services

- David Brooks, *Head of Engineering Services*
- James Nicholl
- John Strachan

Bush, Inver and Bush Nursery

- David Anderson, *Head of Stations*

Bush

- Colin Gordon
- Hamish Howell
- Nelson Innes
- Gavin Mackie
- Martin Mckinnon, BSc
- Steven Osborne, BSc
- Steven Sloan

Inver

- Nick Evans
- Bill Rayner

Bush Nursery

- David Clark, *Nursery Manager*
- John Armstrong
- Graeme Crozier
- Alan Purves

*Denotes part-time.

KEY: ■ Alice Holt ■ Northern Research Station ● Ae, Midlands and Wales ■ Field Stations

Cairnbaan

- Dave Tracy, BSc, *Head of Station*
- Pauline Simson, BSc
- James Wilson

Kielder and Mabie

- Dave Watterson, *Head of Stations*

Kielder

- Terry Gray
- Mike Ryan
- Len Thornton

Mabie

- James Duff
- Joanna McGregor*
- Hazel MacLean
- Harry Watson
- James White

Newton and Lairg

- Alistair MacLeod, *Head of Stations*

Newton

- Hazel Andrew*
- Allison Cowie
- Andrew Kennedy, BSc
- Finlay McAllister, BA, BSc
- Fraser McBirnie
- Stuart McBirnie
- Hugh MacKay, BSc
- Stephen O'Kane
- Colin Smart
- Linda Tedford

Lairg

- Alexander Bowran
- Calum Murray
- Duncan Williams

Technical Services (South)

- Norman Day, *Head of Branch*

Alice Holt

- Nick Tucker, *Head of Station*
- Jamie Awdry
- Bob Bellis
- Sue Bellis
- Tony Bright
- Kate Harris
- Steve Coventry
- Ian Keywood
- Vicky Lawrence
- Tony Martin
- Ralph Nickerson
- Doug Nisbet
- Jim Page
- Bill Page

Alice Holt Workshop

- John Davey
- Mike Johnston

Exeter

- Dave Rogers, *Head of Station*
- Alan Ockenden
- Dave Parker
- Anthony Reeves
- Barnaby Wylder*

Fineshade and Thetford

- Dave West, *Head of Stations*
- Elizabeth Richardson

Thetford

- John Lakey
- Paul Turner
- Alistair Whybrow
- Steven Whall

Shobdon

- Nick Fielding, *Head of Station*
- Brian Hanwell, BSc
- Jason Jones
- John Price
- Sharon O'Hare*
- Richard Nicoll

Talybont

- Chris Jones, BSc, *Head of Station*
- Lyn Ackroyd*
- Sam Catchpole, BSc
- Justin Chappell
- Dai Evans
- Carl Foster
- Ben Griffin, BSc
- Richard Keddle
- Tony Price
- Rachel Sparks
- Ken Williams
- Colin Clayton

Wykeham

- Davey Kerr, *Head of Station*
- Ian Blair
- Lee Cooper
- Nicola Corney
- Alex Hill
- Patricia Jackson*
- William Riddick

*Denotes part-time.

KEY: ■ Alice Holt ■ Northern Research Station ● Ae, Midlands and Wales ■ Field Stations

PhD students linked with Forest Research

Helen Billiald (Sussex University)
Lois Canham (University of Stirling)
Lauren Crawford (Imperial College)
Richard Curtis (University of Gloucester)
Hannah Drewitt (University of Durham)
Sharon Flint (Manchester Metropolitan University)
Samantha Gale (Abertay University)
Caroline Hacker (Imperial College)
Joe Hope (University of Stirling)
Jack Johnston (Ulster University)
Amanda Lloyd (Newcastle University)
Anna Manoukiantis (University of Brighton)
Tanya Ogilvy (Edinburgh University)
Vini Pereira (Imperial College)
Pernille Schiellerup (University College London)
Helen Sellars (University of Liverpool)
Helen Shaw (University of Stirling)
Suzanne Swanwick (Cranfield University)
Janine Tan (Ulster University)
Louise Timms (Imperial College)
Alessandra Timarco (Reading University)
Georgios Xenakis (Edinburgh University)
Liz Young (University of Portsmouth)

Research associate

Steve Petty, PhD

*Denotes part-time.

KEY: ■ Alice Holt ■ Northern Research Station ● Ae, Midlands and Wales ■ Field Stations