



FR **Eye**
July 2008



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Welcome, to the July issue of *FR Eye*!

You'll find here news about what Forest Research staff have been up to recently, including details of a new Research Note on Red Band Needle Blight, a new report which gives guidance on planting trees on landfill sites, the launch of the new Rural Research and Strategy Partnership (a collaboration between FR and four universities) and research that uses remote sensing to help foresters plan their felling activities.

We know that everyone is swamped with information, which makes us doubly pleased with reader responses to *FR Eye*. Recent figures show that we have many regular readers, but technologies and preferences change and we want to be sure we are answering your needs. To gather this information, we'd be pleased if you would complete our (brief) **survey about *FR Eye*** and how it works for you...

Finally and most significantly, Forest Research has a new Chief Executive – Dr James Pendlebury, whom we welcome from his previous post as Head of FC Specialist Advisors. Although only three weeks into his new role, James is rapidly getting to know FR and engage directly with staff, so he is already becoming a familiar face around the FR stations.

If you've missed any previous issues, they can be accessed via our archive at:

www.forestresearch.gov.uk/freye

If you would like to contact the editorial team or to request an email notification of future issues as they go live, write to us at: **newsletter@forestry.gsi.gov.uk**

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Welcome to new staff:



FR Welcomes James Pendlebury as new Chief Executive

On 16 June, Forest Research welcomed its new Chief Executive Dr James Pendlebury. James has had a distinguished career in research, management and market development in the timber and forestry sectors in several countries.

James brings a wide range of experience to the post. He holds a BSc Honours degree in forestry from Aberdeen University, and was awarded a PhD from the same university for a thesis on the preservation characteristics of tropical hardwood species from Malaysia.

He has held timber research positions in several countries, including the UK, United States, South Africa and New Zealand. He has been head of the TNO Centre for Timber Research in The Netherlands and more recently Chief Executive of Highland Birchwoods in Scotland. Since joining the Forestry Commission six years ago he has held several posts, including business policy advisor for Forestry Commission Scotland and a period on secondment to the Scottish Government's Renewables Policy Team.

He is a graduate of the Cabinet Office Leaders UK programme to develop collaborative leadership skills for public service excellence, and a member of the Institute of Wood Science, the Institute of Directors and the International Research Group on Wood Preservation.



Dr Trevor Fenning joined FMD (NRS) on 1 May. He will be working with Steve Lee and Margaret O'Donnell to improve the tissue culture systems for Sitka spruce, specifically to improve the rates of embryo and plant production necessary to make this a practical technology for the FC in future.

Trevor gained a BSc in Applied Biology in 1985 from Cardiff University and a PhD from the University of Nottingham, which is where he first became interested in plant tissue culture. He joined Horticulture Research International in 1989, initially at East Malling and then later at Wellesbourne, where he worked on the 'Farm Woodland' project. During this time, Trevor became a regular visitor to FR at Alice Holt, collaborating with Clive Brasier on research into Dutch elm disease in English elms.

In 1996 Trevor joined the newly formed Max Planck Institute for Chemical Ecology in Jena, Germany. He led projects that used tissue culture and genetic transformation systems to study the direct and indirect defence responses of Norway spruce and the European field elm in relation to attack by insects, before returning to the UK to join FR.

Vienna is perhaps best known for its cakes and walzes, but in May it was the venue for a series of meetings that examined the sustainability of the forest-wood chain (FWC) across Europe. The meetings marked the halfway point of the EU-funded four-year EFORWOOD project and were attended by 74 scientists from 17 different countries, including Stefania Pizzirani, David Edwards and Bruce Nicoll from Forest Research.

Data gathered by the Framework 6 project EFORWOOD will be shared amongst all the partner countries and will contribute to the FC's aim to develop, analyse and maintain a sustainable, carbon-sensitive forest-wood chain within the UK. As our contribution, Forest Research is supplying the figures and statistics relating to forest management, harvesting and transport within the UK. Data on a total of 27 indicators (including production cost, employment, greenhouse gas emissions and carbon stock) is already being collected by the project. As always for large modelling projects, data quality and availability are significant challenges. However, presentations at the Vienna meeting demonstrated considerable progress with three regional case studies, consideration of future climate scenarios that may affect the FWC, and cost-benefit analysis comparing contr

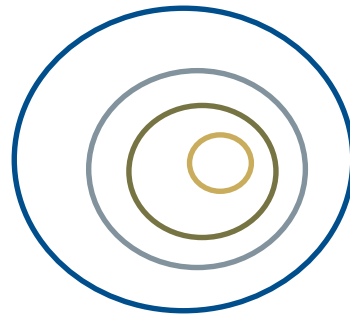
The project is now focusing on the development of a decision support for Sustainability Impact Assessment). The second prototype of this dynamic model has been released and is being tested by partners.

Overall, the conference was very useful, specifically agreeing milestones for the next two years. It also provided participants with opportunities to network, share results and resources, and develop new ideas and refining modelling techniques.

More information about EFORWOOD is available from: www.forestresearch.gov.uk/eforwood



The Rural Research and Strategy Partnership (RRSP), a new collaboration between Forest Research and the universities of Reading, Surrey, Sussex and the University College for the Creative Arts has been launched.



Rural Research and Strategy Partnership

This new initiative aims to build the rural knowledge base in South East England by addressing critical issues in the field of rural sustainability. Specifically, the partnership's role is to broker and bring together new communities and collaborations of key policy-makers, rural stakeholder groups and multi-disciplinary teams of researchers. The aim is to encourage the generation and use of new research evidence to inform rural policy-making.

'A Breath of Fresh Air' – the partnership's official launch event, was held in London on 24 April. This provided a successful prelude to the partnership's activities and promoted relationships between the region's rural stakeholders. The keynote speaker at the event was Dr Stuart Burgess, the Government's Rural Advocate. Other speakers included Valerie Carter, Rural Director for the South East of England Development Agency (SEEDA) and SEEDA's Chief Scientist and Head of Innovation, Dr Ed Metcalfe.

The partnership now has a part-time co-ordinator, Dr Anja Ueberjahn-Tritta, who is based at Forest Research's offices at Alice Holt. This autumn, the RRSP will organise a number of research workshops on some of the rural sectors' 'hot topics' with the aim of engaging researchers and stakeholders and stimulating new research projects and collaborations.

More details on upcoming events, as well as more general information about the partnership, including the launch event's summary of proceedings, can be found online at www.forestresearch.gov.uk/rrsp

Forest Research's **Biomass Energy Centre** (BEC) and Urban Regeneration and Greenspace Centre (URGC) were on centre stage at the recent Sustainabilitylive! Exhibition, hosted within the cavernous National Exhibition Centre, Birmingham. The exhibition included over 450 organisations from the regeneration, energy, water and sustainable technology sectors and was held over three days in late May.

The BEC provides a one-stop shop offering advice and guidance on a wide range of biomass fuels and conversion technologies. BEC staff are keen to continue to develop links with other organisations, so that when they receive specialist enquiries that they can't answer directly, they "know someone who can". This year, they were joined on the stand by staff from FR's soon-to-be-launched URGC, which will provide a similar service in the area of urban regeneration and greenspace.

Both BEC and URGC were kept busy answering queries, distributing literature and taking details of people interested in joint working. Geoff Hogan, who handles many of the enquiries to BEC, was very pleased with the number and level of queries. He comments that "the growing interest in biomass energy was reflected by the increase in renewable energy companies at the exhibition and many enquires were more sophisticated and detailed than in previous years. It is clear that the BEC is recognised as a source of objective expert advice".

The stand was completed by a co-ordinated array of displays explaining the work of the Forest Research Divisions and the eye-catching Forest Research sails that enabled the stand to be seen from across the crowded exhibition halls. The free rowan trees – parcelled up in FR-labelled brown paper carrier bags – proved to be popular and frequently remarked upon giveaways.

Many very promising contacts were made and the FR staff who attended the show are now following up on leads, forwarding on information, putting enquirers in touch with the relevant FR expert and generally translating early interest into activity.



In the past, guidance on restoring landfill sites in the UK actively discouraged tree establishment because of problems with roots penetrating the clay capping. There was also concern that the trees would not thrive or would easily be uprooted because of shallow soils and infertile conditions. However, as reported in a recent Forest Research publication, *Woodland Establishment on Landfill Sites: Ten Years of Research*, planting on such sites can be an effective land management approach. The report provides new guidance on planting trees when restoring landfill sites while minimising the risk of compromising the necessary pollution control.

In 1992, FR conducted a review of the potential for trees on landfill sites. This suggested that tree establishment was viable if the landfill cap was of suitable quality to prevent root penetration and if soil was of sufficient depth and quality to sustain tree growth. To investigate this further, new experiments were established. The first, located at a 15-year-old containment landfill site found that tree root development was affected by soil thickness. Root penetration into the cap appeared to occur when the bulk density was lower than that necessary to achieve permeability threshold values for pollution control. The research showed the likelihood of root penetration into the mineral cap was reduced almost to zero when soil depth was greater than 1.5 metres.

In addition, five experiments were set up on modern containment landfill sites across England to test the relative performance of 14 native and non-native woodland tree species over a 10-year period. The experiments demonstrated that several species, including poplar, alder, cherry, whitebeam and ash, can usually be established on landfill sites with survival rates comparable to other brownfield sites. Despite site infertility, growth of many tree species was similar to that on greenfield sites.

Much more detailed information and guidance is given in the 75-page report, which was published by the Department for Communities and Local Government, and is available online at <http://www.communities.gov.uk/publications/planningandbuilding/woodlandestablishment>.

Andy Moffat, Danielle Sinnett and Tony Hutchings

Phil Comeau, a Professor of Silviculture from the University of Alberta, visited Forest Research for two weeks in May 2008 to work with staff involved with continuous cover forestry (CCF). As a management practice, CCF avoids clearfelling and replanting, instead retaining forest cover at one or more canopy levels.

With CCF, restocking takes place beneath a forest canopy rather than in the open, so a crucial success factor is sufficient below-canopy light to enable seedling growth. Phil has been awarded the 2008 Scottish Forestry Trust fellowship to work on calculating a Stand Density Index (SDI) for Sitka spruce and Douglas fir, and to relate this to understorey light levels. The SDI is based on stocking and basal area, both of which are relatively easy to measure, making it a practical tool for forest managers who aim to optimise their forest light levels.

During his visit to Alice Holt, FR staff provided Phil with data from the permanent sample plot network for his calculations of SDI of unthinned stands. He spent time at FR's Northern Research Station and visited sites in Scotland, to identify thinned stands where he can make light measurements later in the year. Phil also gave a seminar on 'Silviculture in Western Canada', and participated in a field visit to Kyoie Wood in Northumbria.

Phil will return to Forest Research for two months in autumn 2008 to complete this study, which will complement existing work by Sophie Hale on **estimating understorey light**.

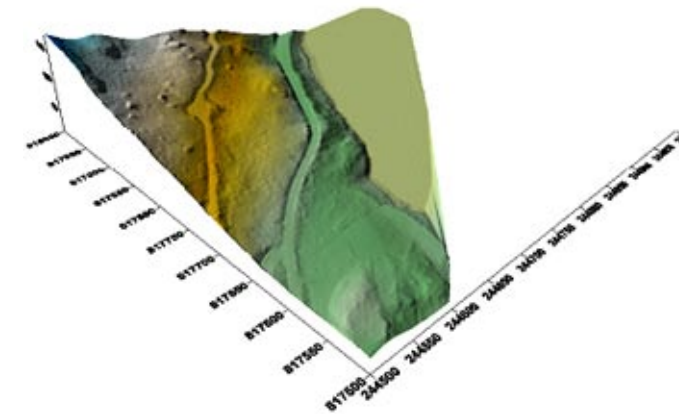
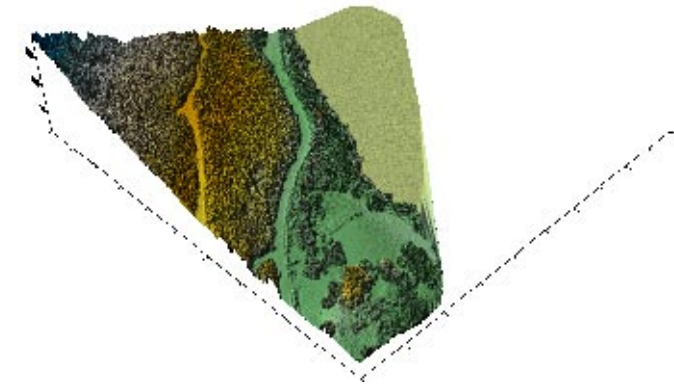


So how has FR helped foresters assess which machinery will be best for individual operations?

Forestry Commission woodland along the banks of Loch Ness above the trunk road between Fort William and Inverness is becoming mature enough to be harvested. For areas such as this, FR has developed a method for detecting individual trees and ground roughness to assist FE plan their felling operations. It does this by using LiDAR technology which bounces laser pulses from an overhead plane to the area below and back; the range to an object is determined by measuring the time delay between transmission of a pulse and detection of the reflected signal. The procedure has been used to give planners good information about the location and number of the largest trees, so they are able to plan the harvesting and extraction as effectively as possible."

The procedure followed a series of steps:

1. firstly data was processed to filter out the last LiDAR return hits – ie the ones most likely to be ground level rather than canopy
2. then the first returns were processed to create a Digital Surface Model (DSM) - which represents the height of the ground vegetation
3. then the last returns were processed to generate a Digital Terrain Model (DTM). This model was further processed to calculate slope angle and ground roughness which is used to assess which logging machinery is suitable
4. and finally a routine was developed to map the location of individual trees on the ground and calculate their height directly as the difference between the DSM and DTM.



Top: Digital Surface Model
(Loch Ness appears as the big flat area);
Bottom: Digital Terrain Model

Information about the forthcoming Silvilaser conference can be found on www.forestresearch.gov.uk/silvilaser2008

Juan Suarez and Jackie Rosette

Publications on Land Regeneration and Urban Greening by Forest Research authors

Best Practice Guidance Notes for Land Regeneration

A series of Best Practice Guidance (BPG) Notes on a range of issues affecting the successful establishment of greenspace on contaminated and brownfield land. The following three notes were published in May 2008.

BPG Note 12: *Protection of trees from mammal damage*, by Roger Trout and Andy Brunt

BPG Note 13: *Complete cultivation*, by Danielle Sinnott

BPG Note 14: *Working with the historic environment*, by Peter Crow and Tim Yarnell

All are available to download at <http://www.forestry.gov.uk/lru/INFD-6AZDCE>

Contaminated Land: Applications in Real Environments (CL:AIRE) Publications

CL:AIRE Research Bulletin 7

Field Portable X-ray Fluorescence (FPXRF): A rapid and low cost alternative for measuring metals and metalloids in soils.

This bulletin provides guidance on the use of field portable X-ray fluorescence for determining heavy metal concentrations in soils.

<http://www.forestresearch.gov.uk/fr/INFD-5WPKNB>

CL:AIRE SUBR:IM Bulletin 10

The use of compost in the regeneration of brownfield land.

This bulletin considers the use of compost in brownfield projects. <http://www.forestresearch.gov.uk/fr/INFD-5WQCFS>

Research Notes

The Environmental Change Network in Alice Holt Forest,
by Suzanne Benham (FCRN001)

The Environmental Change Network (ECN) was established in 1992 to provide a framework for monitoring the effects of a range of environmental drivers on freshwater and terrestrial ecosystems. The Alice Holt ECN site represents the Forestry Commission's commitment to this long-term collaborative programme. This Research Note reviews data collected at the Alice Holt site over 14 years of operation from 1992–2006. Evidence of the impacts of climate change, pollution and their interaction with land management are explored. Monitoring of air quality has demonstrated a decline in the levels of some harmful pollutants and this is reflected in a reduction in soil acidity and resulting changes in plant communities. Meteorological data provide evidence that the climate is changing with significant trends in summer rainfall and winter cold days. Changes in moth populations have been linked to changes in climate while the decline in some butterfly species is identified as a possible consequence of reduction in open space. In contrast, this reduction has benefited several species of ground beetle, which prefer shady conditions. Bird surveys have enabled assessment and identification of possible causes of changes to the woodland bird populations, including those species subject to Biodiversity Action Plans. Similar trends are becoming apparent across the network, providing a robust early warning system for detecting changes in natural ecosystems as the effects of climate change set in.

Go to **Latest Publications** and find under the “Scientific and technical publications” heading.



Research Notes

Red band needle blight,

by Anna Brown and Joan Webber (FCRN002)

Red band needle blight is an economically important disease affecting a number of coniferous trees, in particular pines. The disease has a world-wide distribution but until recently it was mainly of concern in the southern hemisphere. In much of the world and in Britain it is caused by the fungus *Dothistroma septosporum*. Red band needle blight causes premature needle defoliation which results in the loss of timber yield and, in severe cases, tree mortality. Since the late 1990s the incidence of the disease has increased dramatically in Britain, particularly on Corsican pine (*Pinus nigra ssp. laricio*), and due to the extent and severity of the disease on this species, there is now a five-year planting moratorium of it on the Forestry Commission estate. More recently there have been reports of the disease causing damage to lodgepole pine in Scotland and it has also been reported on Scots pine – although it rarely appears to be causing significant damage to this species. Reasons for the increase in disease incidence are unclear but could be due to increased rainfall in spring and summer coupled with a trend towards warmer springs, optimising conditions for spore dispersal and infection. Such conditions may become more prevalent in Britain over the next 20 years if current trends in climate change continue. In Britain disease management is currently focused on silvicultural measures to reduce inoculum loads and the use of alternative, less susceptible species in future rotations.

Go to **Latest Publications** and find under the “Scientific and technical publications” heading.



STORMRISK

Development of STORM resistant landscapes through regional co-operation, adapted management and RISK communication

www.forestresearch.gov.uk/fr/INFD-7G4A7Z

Dissolved organic carbon in soil solution

Quantification of DOC concentrations and fluxes in UK topsoils

www.forestresearch.gov.uk/fr/INFD-7FQE9F

Road-testing of indicators for assessing site specific soil quality

Testing proposed 'prompt values' for soil quality indicators against field experimental data and the research community.

www.forestresearch.gov.uk/fr/INFD-7FQDWN



Full details of FR's events are available from the FR website: www.forestresearch.gov.uk/events

4 August

Hylobius Management Support System Training Day
Training course to help foresters develop an understanding of how Hylobius populations behave on a site. Forest Research, Forestry Commission Learning and Development, Ae, Dumfries, Scotland
www.forestresearch.gov.uk/fr/INFD-7BHET

14–19 September

The Woodfuel Supply Chain – Sharing experience
Workshop to present shared experience of the development of the woodfuel supply chain in England and elsewhere, problems overcome, milestones achieved and hurdles yet to be overcome. Organised by: Biomass Energy Centre in conjunction with IEA Bioenergy Tasks 31, 38 and 40, University of Warwick
www.forestresearch.gov.uk/fr/INFD-7BHETH

17–19 September

Impacts of pollution in a Changing Urban Environment
Conference to address the challenges posed by pollution in cities. PUrE consortium, University of Manchester
www.forestresearch.gov.uk/fr/INFD-7CAC5U

17–19 September

SilviLaser 2008: LiDAR applications in forest assessment and inventory

Conference themes include LiDAR data fusion, forest applications, algorithm and techniques development, large-scale applications of LiDAR, operational LiDAR and new technologies.

www.forestresearch.gov.uk/silvilaser2008

22 and 24 October

Forest wind damage modelling workshop
International workshop contributing to IUFRO unit 8.01.11 "Impact of wind on forests" and an opportunity to examine and discuss current methods for tree biomechanics measurement and modelling of forest wind risk. Forest Research, Roslin, Scotland
www.forestresearch.gov.uk/fr/INFD-7DPDGA