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Intensely white bark on a dull winter's day

*During a recent visit to the Royal Botanic Garden Edinburgh, I came across a magnificent specimen of West Himalayan birch (*Betula utilis* var. *jacquemontii*). On the grey winter day, its intensely white bark stood out against the dark background. It was a pleasure to see, even from a distance. Young branches of West Himalayan Birch have a brown colour but the bark of the stem peels off horizontally in papery flakes revealing the strikingly white inner layers. The bark is strewn with creamy grey lenticels in the shape of long, horizontal dashes which give it a very attractive appearance.*

*As its common name suggests, *Betula utilis* is native to the Himalayan mountains but widely planted in British gardens. Silver birch (*Betula pendula*) and downy birch (*Betula pubescens*) are the two birch species native to Britain, their bark is not as smooth and white. There are three National Plant Collections of *Betula*: Wakehurst Place in Sussex, Hergest Croft Gardens in Herefordshire and Stone Lane Gardens in Devon.*



Welcome to the January issue of *Ecotype*, the Biodiversity and Conservation Newsletter for the Ecology Division of Forest Research.

This issue provides you with an insight into some recent research projects in our Division.

Rebecca Brassey gives an update on a project that investigates a suite of measures for the performance and health of red deer with a view to developing a long-term monitoring system.

Russell Anderson has recently organised a questionnaire survey with the forestry industry and feeds back how its outcomes are used to prioritise the research needs in open habitat restoration.

Darren Moseley describes a project that takes a multifunctional approach to greenspace for both people and wildlife by including humans as a focal species.

Jason Hubert reports on the successful establishment of regional seed orchards of silver birch grown as grafts from trees selected for their key traits as high quality timber.

This is followed by **Amy Eycott's** description of a systematic review on landscape connectivity that addresses which landscape features affect species movement and dispersal.

And finally, **Duncan Ray** introduces an EU project on forests and climate change to which Forest Research contributes a case study on assessing productive upland Sitka spruce forests.

These examples of our research are rounded off with news and information on some conferences.

I hope you will find this issue of *Ecotype* interesting and enjoyable to read.

Andrea Kiewitt
Editor

Red deer performance and health

Rebecca Brassey

Red deer are an iconic element of the Scottish fauna and have impacts on both our natural heritage and the sustainability of rural economies. To predict how Scottish deer populations will respond to future changes in climate and land use we need to monitor their performance and health under a wide range of current environmental and management conditions.



Corrour estate open hill

The Scottish Government, via the [Deer Commission for Scotland](#), has commissioned Forest Research, in collaboration with the [Macaulay Institute](#), to develop a suite of measures for [deer performance and health](#) that can be easily and reliably recorded by deer managers.

Estate recruitment

In order to carry out the research we require the active participation of deer and larder managers to help us evaluate the practicality and usefulness of such a suite of measures.

Sixteen large open hill estates have been recruited across Scotland so far, with the aim of having eventually twenty altogether. The estates were selected to encompass a range of climatic conditions, habitat type, management objectives, deer and sheep density.

Developing a suite of indicators

The research is divided into an initial pilot study encompassing this year's hind season, and a main study taking part across the stag and hind seasons of 2009. During the pilot study we will be assessing the usefulness of a wide range of potential measures to determine:

- ▶ which can be measured with greatest consistency,
- ▶ which provide the most useful management data, and
- ▶ which are practical to record.

The indicators being tested in the first phase of the project include calf:hind ratio, weight, body condition, pregnancy and lactation status, body size, habitat where culled, disease and parasite status, and age.

During the pilot study participants will be encouraged to comment on the practicality and usefulness of the different measures so that any necessary amendments can be made in preparation for the main study. The project will run until March 2010 with the overall aim of developing a long-term monitoring system.



Red Deer Stag at Badanloch

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Open habitats research needs

Russell Anderson



One of the greatest challenges facing researchers is ensuring that the research we do is that which best meets our customers' needs. Our main funding comes from government but the customer is the UK forestry industry. For the [Open Habitats Research Programme](#), we conducted a questionnaire survey to identify the industry's needs.

This showed that demand is greatest for research on restoring open habitats that were lost to afforestation in the past. In England this relates mainly to lowland heathland while in Scotland and Wales, bogs are the main restoration target. The policy-makers need to know what the benefits of such restoration are and how it impacts on the environment. Practitioners need guidance on where restoration is likely to succeed, how to rewet dried-out bogs and what to do about regenerating trees.

The questionnaire survey also clearly indicated that research is needed on sustainable methods with which existing open habitats can be managed for biodiversity. Managed grazing is widely seen as a likely solution but research is needed to evaluate the practice and provide practical guidance on regimes suited to forest open ground situations. Guidance is also needed for appropriate mechanical methods on sites where grazing is not practical.



Grazing on restored calcareous grassland at Whitbarrow Forest

Another research area highlighted in the survey was decision support for those priority open habitats with a strong successional tendency, especially where succession might create priority woodland habitats. This leads, for example, to questions such as:

- ▶ Should fens and reedbeds be allowed to scrub over and form wet woodland?
- ▶ Should montane base-rich grassland be allowed to develop scrub?
- ▶ Should Caledonian pinewood be permitted to invade priority open habitats?



Restored lowland heathland at Wareham Forest

Unfortunately, funding is not sufficient to tackle all these topics at once. But we are prioritising the research needs expressed by the forestry industry and aim to cover those of the highest priority within the programme. Some of the topics identified can also be tackled in collaboration with universities through, for example, joint masters projects.

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Urban green networks for people

Darren Moseley



Many people are encouraged to use greenspaces in and around our towns and cities for recreation, experiencing the benefits this environment brings to physical and mental health. A project funded by the Scotland and Northern Ireland Forum For Environmental Research ([SNIFFER](#)) was undertaken by Ecology Division in collaboration with the Social and Economic Research Group of Forest Research. The aim was to examine how a multifunctional approach to greenspace could be developed for both people and wildlife.

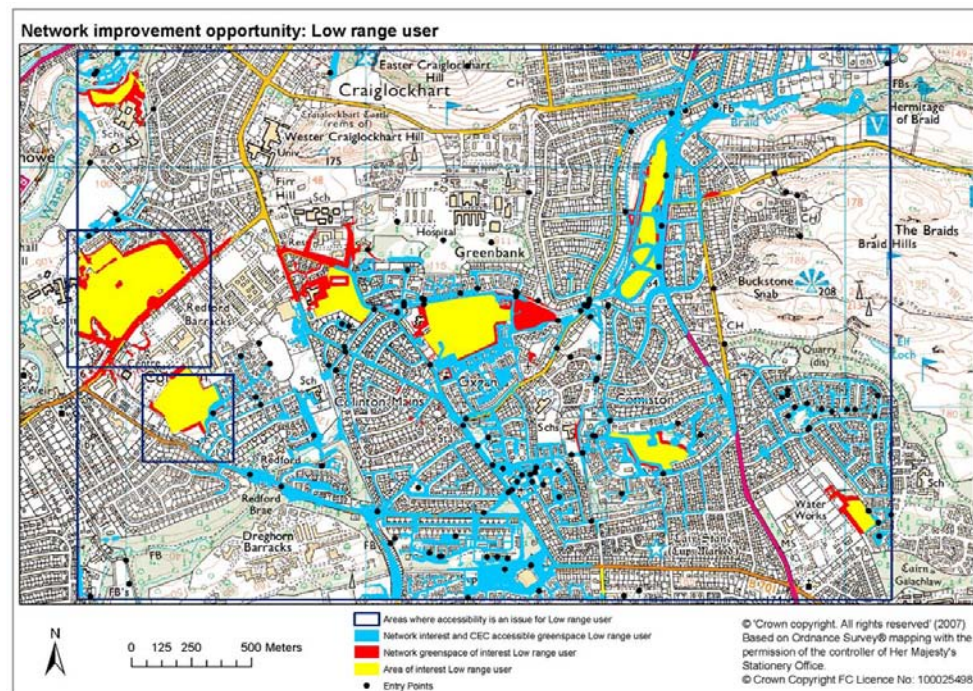
The novel aspect of the project involved the characterisation of people as a focal species by creating three profiles to represent:

1. people who are currently less likely to engage with greenspace,
2. active and confident people who readily use a range of greenspace types; and
3. 'average' users with an intermediate level of engagement.

These profiles, termed 'low', 'high' and 'medium range users', were incorporated into the modelling process to demonstrate the types of greenspace likely to be used by different people and how people may move through the intervening areas.

A series of scenarios for greenspace accessibility and preferences was applied to each of the three user profiles, ranging from an assumption that all greenspace is equally usable by all profiles to a perhaps more realistic situation where only the most suitable of greenspace areas were selected for each profile. The latter analysis allowed us to examine where greenspace accessibility could be improved through managing existing greenspace or creating new areas.

For further details see www.forestresearch.gov.uk/habitatnetworks.



Network improvement opportunities to target low range users: network area in blue, other potential areas in yellow, extended network in red

The applicability of such networks to people, together with biodiversity network and socio-environmental data used in this project, can provide a key component in an integrated approach to planning for sustainable development. The approach will support action in meeting targets for social inclusion, public health, Local Biodiversity Action Plans, and ecosystem functions.

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Improved silver birch

Jason Hubert



Seed of improved silver birch (*Betula pendula*) has now been collected from seed orchards established at Forest Research's Northern Research Station. The orchards are the result of a collaboration between the [Birch Group](#), part of the [British and Irish Hardwoods Improvement Programme \(BIHIP\)](#), and Forest Research.

A regional approach to the seed orchards had been adopted because early results from provenance trials indicated that birch does not tolerate transfer of material over very long distances. The first regional collection was based around Tayside in Perthshire. Forty seven plus trees were selected on the basis of excellent form, i.e. straight stems, fine branching, no defects, healthy and, ideally, above average growth, all key traits in the production of high quality timber. Tree climbers collected scions in the winter of 2003/04 for grafting onto downy birch rootstocks. Despite difficulties of grafting mature twigs the success rate has been very high.



Silver birch seed orchard grown in pots from grafts

The grafts are grown in pots and have been housed in a polyhouse at our Northern Research Station since spring 2005. This is now a registered untested clonal seed orchard.

The fact that the plants are in pots and can be moved easily in and out of the polyhouse gives this system great flexibility. Given a good stock of plus trees, a seed supply can be created from one polyhouse that covers a wide area, e.g. the whole of Scotland. Another seed orchard is registered which is based on the Cairngorm/Aberdeenshire region. In addition, collections of plus trees exist for the Great Glen region and the Southern Scotland/Northern England area.

The next step is to quantify the level of improvement in the new generation of birch trees, and trials will be established in spring 2010 to compare the growth and form of the improved seed with commercially available material.

Details of other improvement programmes can be found at www.bihip.org.



One of the selected straight stemmed silver birch plus trees from the Tayside region

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ForeSTClim - climate change adaptation strategies for forests

Duncan Ray



[ForeSTClim](#) is the short name for an EU Interreg IVb funded project on forests and climate change called 'Transnational Forest Management Strategies in Response to Regional Climate Change Impacts'. The project has 21 partners from the UK, Germany, France, The Netherlands, and Luxembourg who will develop climate change adaptation strategies in the forests of north-west Europe. It will run for four years until 2012. In the UK the project brings together science and policy teams from Forest Research, the Centre for Ecology and Hydrology, the universities of Newcastle and Bangor, Mountain Environments and the Mersey Forest.

Forest Research is developing a case study area in the Scottish Borders. Information and data will be used to assess the needs and options for climate change adaptation in a productive upland Sitka spruce forest. Using future climate projections from the [UK Climate Impacts Programme \(UKCIP 09\)](#), and from a team of climate scientists working within the project, we will test forest design plans and silvicultural systems. This will involve suitable tree species suggested by the [Ecological Site Classification \(ESC\)](#), and the risk of wind damage using the [ForestGALES](#) model. In addition we will develop a small set of indicators to measure forest productive capacity, environmental quality, biodiversity maintenance and social impacts.

Working closely with Forestry Commission Scotland, initial work will focus on the development of a baseline management scenario for the forest, based on current forest design plans.

www.forestclim.eu 

By running the plans forward in time we will create snapshots of the likely spatial and structural components of the forest landscape in the future. In March 2009, the new UKCIP data will be released, providing new insights into the probability of climate change in the future. With these data we hope to assess abiotic impacts for the future forest, and test different adaptation scenarios. The project will also assess how climate change and different types of adaptation will affect water quality and quantity.

Working closely with our UK and European partners we hope to assess how ESC and ForestGALES perform in other countries. The project is closely aligned with core funded work - to develop decision support tools that support climate change adaptation in the UK.



Delegates at the ForeSTClim opening conference last September in Germany


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News and conferences

Conference on forest trees and climate change

[Jason Hubert](#), project leader for genetic conservation, was an invited speaker at a recent event organised by [Bioversity International](#) which was part of the [European Forest Week 2008](#). This was a conference about the adaptation of forest trees to climate change and the particular role for forest genetic resources. Jason's presentation focused on strategies for the use of genetic resources to reduce the impacts of climate change and can be downloaded from:

http://www.evoltree.eu/index.php?option=com_docman&task=docdownload&gid=247  (PDF-2480K)

Student conference on environmental management and conservation

[Stirling University](#) is hosting a one day student conference entitled '[The Evidence Base for Environmental Management & Conservation](#)' on 06 April 2009. This is being sponsored by [Scottish Natural Heritage](#) and the [Scottish Environment Protection Agency](#) and will be opened by the Scottish Minister for the Environment, Mike Russell. Professor Andrew Watkinson, the director of the 'Living With Environmental Change' programme of the [University of East Anglia](#), will be giving a plenary presentation. The aim of the conference is to provide students in environmental management and conservation research an opportunity to present their work, and to give them an opportunity to find out more about the work of government agencies and NGOs in management and conservation.

Information on registration and abstract submission are also available at:

http://www.sbes.stir.ac.uk/conservation_conference/.

Forum on Scotland's changing rural biodiversity

A forum on '[Scotland's changing rural biodiversity: Policy and action needs](#)', organised by the [Edinburgh Consortium for Rural Research](#) in association with the [Aberdeen Research Consortium](#) and the [Scottish Biodiversity Forum](#), will be held at the SNH Battleby Centre, near Perth, on 13 May 2009. The aim of this one-day forum is to present and discuss current knowledge on the status and values of Scotland's rural biodiversity and to explore successes and failures in achieving biodiversity goals, how these goals are and could be integrated into key policies, and how diverse partners can work together at landscape and other scales to achieve biodiversity and other goals. The deadline for submitting abstracts for posters is 20 February.

Information on registration and abstract submission are also available at:

<http://www.cms.uhi.ac.uk/Ecrr.htm>.

About Ecotype

Who reads Ecotype

Ecotype addresses forestry practitioners and conservation professionals, in both the public and private sectors. Amongst our readership are people from:

- County and District Councils
- Natural England
- DEFRA
- Wildlife Trusts
- National Trust
- British Trust for Ornithology
- RSPB
- Woodland Trust
- Forestry Commission, Forest Enterprise
- Centre for Ecology & Hydrology
- Natural Environment Research Council
- Universities, Museums
- Private Consultants
- Interested individuals

Who contributes

Most of the articles are written by people within the Ecology Division and sometimes other parts of Forest Research about work related to biodiversity and conservation management of forests and woodlands. Contributions may also be invited from other parts of the Forestry Commission, and others working within forest biodiversity and conservation, subject to relevance to the main themes of Ecotype. Note that the editor reserves the right to edit, delay or reject articles depending on the space available and relevance of the subject.

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Visit the web pages of Ecology Division at:

www.forestresearch.gov.uk/ecology

For more general information about the work of Forest Research, please visit our website at:

www.forestresearch.gov.uk

For information on seminars, conferences and training days in which Forest Research are involved see the events webpage at:

www.forestresearch.gov.uk/events