

Ecotype

The Biodiversity and Conservation
Newsletter

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Photo: Andrea Kiewitt

The Snow

Oh snow, which sinks so light,
Brown earth is hid from sight
Oh soul, be thou as white as snow,

Oh snow, which falls so slow,
Dear earth quite warm below;
Oh heart, so keep thy glow
Beneath the snow.

Lyrics to 'The Snow' [Sir Edward Elgar, Op. 26]
by Caroline Alice Elgar

Editorial



Welcome to the February issue of Ecotype, the Biodiversity and Conservation Newsletter of Forest Research.

This issue gives you an update on some of the interesting research projects currently undertaken in our organisation.

Darren Moseley and **Mariella Marzano** get this issue on its way by explaining the Green Networks and People research project, a partnership with several organisations and local authorities in Scotland on green network planning and management, particularly in urban settings.

Then **Ralph Harmer** and myself, **Andrea Kiewitt**, from the Priority Habitat Research Group present some intriguing results of a 5-year study into the effects of vegetation development on tree regeneration and whether or not bramble can facilitate the establishment of trees in woodlands by discouraging deer browsing.

In contrast, **Russell Anderson**, also from the habitat team, has to deal with unwanted tree regeneration and trials methods to get rid of vast numbers of birch seedlings that threaten the bog vegetation at Flanders Moss National Nature Reserve.

And finally, **Rebecca Brassey** gives an update on the red deer performance and health project which has moved from the pilot study to the main data collection phase and she tells us what the analysis of potential indicators is showing so far.

There is also some information on a number of forthcoming conferences: the SAC/SEPA Biennial Conference on agriculture and the environment, climate, water and soil in March 2010; the Trees and Forests in British Society Conference in April 2010; and the Conference for the International Association of Landscape Ecologists in September 2010.

This makes a nice selection of our current research projects in Forest Research. I hope you will find this issue of Ecotype interesting and enjoyable to read.

Andrea Kiewitt
Editor

Green networks and people

Darren Moseley and Mariella Marzano

Greenspaces in and around towns and cities provide a wide range of goods and services – including for recreation and physical activity, mental health, landscape quality, biodiversity conservation, water and air quality and sustainable travel options.



Aerial view of greenspaces in an urban setting

The concept of green networks seeks to recognise the importance of networks of greenspaces as an essential component of more sustainable urban environments, and improve the functionality of these networks through better protection and management. However, there is evidence that planners do not always explicitly think of urban green spaces as a multifunctional linked system or how green networks can provide social benefits.

Forest Research are working in partnership with Scottish Natural Heritage, the Glasgow and Clyde Valley Green Network Partnership, and

Forestry Commission Scotland on the action research project 'Green Networks and People', which aims for better integration of multi-functional greenspaces into spatial planning.

The project will develop, test and disseminate new approaches to planning and delivering green networks in and around towns and cities with benefits to people and the environment.

The aim of the research is to support decision-making about green network planning and management at a range of spatial scales. It will incorporate an understanding of how people perceive and use greenspaces and the extent to which different types of spaces contribute to social benefits such as reducing health inequalities, improving community cohesion and increasing quality of life. The outputs will be used to contribute to both national outcomes and Local Authority Single Outcome Agreements in Scotland.

We have completed Phase 1 of the project, a review of existing ways of green network planning and management and of social and environmental data to support potential new approaches. With these findings we can now begin the phase of applied research, in partnership with local authorities and others, to test and develop assessments of green network functionality and decision making for green network planning and management. This will ultimately provide a range of new tools for development planning and urban design.

Further reading

Sandström, U.F. (2002) Green Infrastructure Planning in urban Sweden. *Planning Practice & Research* 17(4): 373-385.

For further information on green networks contact:

Darren Moseley
Centre for Human and Ecological Sciences
Forest Research, Northern Research Station
Roslin, Midlothian EH25 9SY
Tel. 0131 445 6959
E-mail: darren.moseley@forestry.gsi.gov.uk

Does bramble facilitate tree establishment in woodlands?

Ralph Harmer and Andrea Kiewitt

Interactions between plants are often competitive but there is increasing evidence of positive interactions where one species can benefit either directly or indirectly from the presence of another. It is generally recognised that thorny shrubs facilitate the regeneration of trees in grass- and heathland in which grazing animals are present. A similar protective role might also be expected for bramble but foresters usually regard it as a competitive weed that limits woodland tree regeneration. However, young saplings are often seen growing within bramble thickets in woodlands suggesting that these may indeed provide protection against browsing.



Unbrowsed birch seedling in dense bramble thicket

To shed some light on this question, we examined the first 5 years of vegetation development, and growth and browsing of regenerating tree seedlings in a heavily thinned beech woodland in Southern England. This represented the early successional phase of woodland regeneration. The browsing animals present were roe, muntjac and fallow deer, and we monitored their populations by thermal imaging.

The understorey had initially been almost devoid of either bramble or tree seedlings due to the extremely close canopy of the beech. However, following the thinning, bramble patches developed quickly across the site and soon dominated the ground vegetation with dense thickets about 60 cm tall.

Birch and willow, two early successional species, were the only tree seedlings found in sufficient numbers for statistical analysis. Both species differed in mortality and browsing rate, with willow suffering worse than birch. Five years into the experiment, two thirds of the birch seedlings were still alive, 20% of which had been browsed. In comparison, only one third of the willows remained alive, with 90% browsed. Birch reached an average height of about 2 m and thereby considerably exceeded the height of the bramble thickets. In contrast willow, with an average height of around 60 cm, reached only a similar height to the bramble.

There was evidence that bramble facilitated tree establishment in this study, as seedlings of both species within the developing bramble patches were taller and less frequently browsed than those outside.

Although these results indicate that bramble can facilitate the establishment of fast growing willow and birch it may not be true of slower growing tree species. Another aspect to consider is that in this study the bramble was initially absent from the understorey and only started to develop once the canopy was removed, i.e. simultaneously with the seedlings.

Further reading [link to full article is through Main Publications list on Andrea's webpage]

Harmer, R., Kiewitt, A., Morgan, G. and Gill, R. (2010) Does the development of bramble (*Rubus fruticosus* L. agg.) facilitate the growth and establishment of tree seedlings in woodlands by reducing deer browsing damage? *Forestry*, doi:10.1093/forestry/cpp032. [Click here for abstract only.]



Photo: FC Picture Library, John MacFáilish

Roe deer

For further information on tree establishment contact:

Ralph Harmer

Centre for Human and Ecological Sciences

Forest Research, Alice Holt Lodge, Farnham, Surrey GU10 4LH

Tel. 01420 526 152

e-mail: ralph.harmer@forestry.gsi.gov.uk

Dealing with birch on restored lowland bogs

Russell Anderson



Lowland bogs that have been afforested and later restored, often retain an unfortunate legacy of their forestry period: soil conditions which favour tree seed germination and growth. Seedling density, usually of birch, lodgepole pine or Sitka spruce, can be sufficiently high to threaten to shade out the restored bog vegetation.

One site with such a birch problem is the former Poldar Plantation on Flanders Moss National Nature Reserve. It is currently being used to trial various methods of controlling the birch. Russell Anderson of Forest Research is working on the trial in partnership with Scottish Natural Heritage, who own the site.

In order to find out how best to kill the birch, four different methods are being tested of applying a herbicide (glyphosate) which specifically targets woody plants.



The Nomix application method avoids the operator having to dilute the herbicide on-site and reduces wash-off by rain



Glyphosate application by weed-wiper minimises impact on non-target species

These herbicide treatments are also combined with and without follow-up grazing aimed at suppressing further birch growth. The success of the treatments in killing the targeted birch seedlings and their impacts on the bog vegetation underneath are being monitored.

So far, all except one herbicide treatment appear to have a great effect on the birch, kill rates were high. This will need to be assessed further to capture any delayed effects. There were also some effects of the herbicide on four species of the bog vegetation: ling heather, cross-leaved heath, cranberry and hare's-tail cottongrass. These were mostly visual effects, and they were limited to browning of some of the foliage on individual plants. Only the heather was affected badly, and some plants had died. Longer-term effects will be assessed later.

Sheep are being brought in to graze the site this summer but they will be excluded from part of the trial area. This way we hope to compare grazed against ungrazed plots for each of the herbicide treatments. Ideally, the sheep will selectively eat any regenerating birch seedlings, and the more robust of the bog plants, leaving the peat-building *Sphagnum*-mosses to thrive amongst the short vegetation under open conditions.



Sphagnum moss

You might also want to look at the project webpage at: <http://www.forestresearch.gov.uk/fr/INFD-7J5E8Z>

For further information on bog restoration contact:

Russell Anderson

Centre for Human and Ecological Sciences

Forest Research, Northern Research Station

Roslin, Midlothian EH25 9SY

Tel. 0131 445 6971

e-mail: russell.anderson@forestry.gsi.gov.uk

Red deer performance and health - an update

Rebecca Brassey



In order to understand how deer populations across Scotland will respond to future changes in both climate and land use, it is essential to monitor their performance and health under a wide range of current environmental conditions and deer and habitat management strategies. This information can help to determine sustainable levels of healthy and stable populations.

Project progress

The project has successfully recruited 19 large open hill estates across the highlands of Scotland. A unique opportunity to conduct a pilot study during the first year of the project allowed us to test our initial data collection package and make useful modifications in preparation for the main study. The data contribute a range of potential indicators of deer performance and health over three seasons. The current hind and calf season provides similar data to the previously investigated stag season. Additional information on lactation status, pregnancy and fertility will help estimate the reproductive input into the population.



Red deer stags at Reay Forest

A steering group of individuals with experience in research and deer management has been of great benefit to the project and the biannual discussion meetings have been valuable for successful project progression.

Data analysis

With the database now up and running, our next step is to assess each indicator for its ability to produce consistent and informative results. So far, analysis has shown that identifying fertility in hinds is too variable and this led us to greatly simplify the protocol for this aspect.

The next part of the analysis will compare deer age estimated by deer stalkers with a reliable scientific method of age determination which is based on counting the cementum layers within the animal's molar teeth, similar to counting tree rings.

Future of the project

At present, this research is set to continue until March 2010 but we await the outcome of a bid for a further four years funding from Scottish Natural Heritage and the Scottish Government. This extended funding would enable us to compare trends in deer populations with different climatic conditions and allow us to look at the potential effects of climate change.

You might also like to look at our project webpage at: <http://www.forestresearch.gov.uk/deermonitoring>



Participating estates

For further information on the deer project contact:

Rebecca Brassey

Centre for Human and Ecological Sciences

Forest Research, Northern Research Station

Roslin, Midlothian EH25 9SY

Tel. 0131 445 8716

e-mail: rebecca.brassey@forestry.gsi.gov.uk

News and conferences

Squirrels on the run

Now is the time to watch out for grey squirrel mating chases. Early spring breeding (January/February) will mean that juveniles will join the main population in mid May. High numbers of juveniles increase the risk of damage to vulnerable young stands of tree species such as beech, sycamore, oak and thin-barked conifers.

For information on controlling damage by grey squirrels see www.forestresearch.gov.uk/greysquirrels or contact Brenda Mayle.

SAC/SEPA Biennial Conference

The Biennial Conference 2010 on Agriculture and the Environment - Climate, Water and Soil: Science, Policy and Practice, jointly organised by the Scottish Agricultural College SAC, the Scottish Environment Protection agency SEPA, the Macaulay Land Use Research Institute and Forest Research, will take place in Edinburgh on 31 March - 1 April 2010.

This multi-disciplinary conference will address our current understanding of the management of climate, water and soils in a rapidly changing economic and natural environment. The conference will concentrate on how global changes affect issues at national, landscape and local scales. It will present not only the best possible science and research knowledge but also provide a discussion forum. We aim to discuss ways in which policy needs to be adapted to meet future challenges and how management at landscape and local scales can be identified, prioritised and delivered in the context of multiple drivers.

Darren Moseley has been part of the organising committee and recommends that you look at www.sac.ac.uk/sacsepaconf for further information or contact conference organiser Karen Crighton at Karen.Crighton@sac.co.uk.

IALE Conference

The 2010 Conference of the International Association of Landscape Ecologists will be held in Brighton on 13-16 September and is themed 'Future Landscape Ecology'. The conference will bring together scientists from many fields in landscape ecology with policy makers, planners and practitioners interested in developing future landscapes that function for both biodiversity and people. There will be presentations from a variety of research fields, including a number of colleagues from Forest Research, plus workshops and fieldtrips.

Amy Eycott is part of the organising committee and recommends that you see <http://www.iale.org.uk/conference2010> for details of the conference or contact conference2010@iale.org.uk for general enquiries.

The deadline for the submission of abstracts is the 26th February.

'Trees and Forests in British Society' Conference

The conference on 'Trees and Forests in British Society' will be held on April 13-15 April 2010 at the Heriott-Watt-University in Edinburgh. It aims to explore the demands that society places on forestry and the role trees, woods and forests are expected to play.

Ensuring the widest possible social benefits are gained from the management of trees, woods and forests on public as well as private land is a particularly challenging task since society's relationship with trees, woods and forests changes over time. The last decade has seen a significant increase in the available evidence as well as the understanding of the social interactions of British people and their trees and forests. This conference draws on the research produced by the Social and Economic Research Group at Forest Research as well as other public, academic and private research colleagues, to explore and consolidate the state of current knowledge.

You can find more details on <http://www.forestresearch.gov.uk/treesandsociety> or look at <http://www.forestresearch.gov.uk/fr/INFD-7RXE7A> for the conference programme. To book please contact conference organiser Evelyn Hall at evelyn.hall@forestry.gsi.gov.uk before 30 March 2010.

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 Centre for Human and Ecological Sciences 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.

Weblink

www.forestresearch.gov.uk/ecotype

Contact details

To comment, provide material for future issues, or if you wish to receive Ecotype by e-mail, please get in touch with the editor:

The Editor of Ecotype

Andrea Kiewitt

Centre for Human and Ecological Sciences

Forest Research, Alice Holt Lodge

Farnham, Surrey GU10 4LH

Tel. 01420 526 154, Fax 01420 520 558

e-mail: andrea.kiewitt@forestry.gsi.gov.uk

For general enquiries concerning the biodiversity and conservation work of Forest Research, please contact:

Head of the Centre for Human and Ecological Sciences

Chris Quine

Forest Research, Northern Research Station

Roslin, Midlothian EH25 9SY

Tel. 0131 445 2176, Fax 0131 445 5124

e-mail: chris.quine@forestry.gsi.gov.uk

Visit the web pages of the Centre for Human and Ecological Sciences
www.forestresearch.gov.uk/ecology

For general information about Forest Research, please visit our website
www.forestresearch.gov.uk

For information about the human sciences work within the Centre for Human and Ecological Sciences read the 'Growing Places' newsletter available at
www.forestresearch.gov.uk/growingplaces