

Ecotype

Autumn 2012

Ecotype is the biodiversity and conservation newsletter produced by Forest Research's Centre for Human and Ecological Sciences.

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Wild boar are a native UK mammal that became extinct here sometime in the middle ages. After being released from farms, they successfully re-established themselves in the wild during the 1990's. Wild boar are continuing to spread in the UK although they are present in only small numbers with very scattered distribution.

Current studies by Forest Research on Wild Boar in the UK and Italy can be found in the article on page 8.

Robin Gill

Editorial

Welcome to the Autumn 2012 issue of *Ecotype*, the biodiversity and conservation newsletter produced by Forest Research's Centre for Human and Ecological Sciences (CHES).

What's in this issue:

[Darren Moseley](#) gives an update on some collaborative work with the Glasgow and Clyde Valley Network Partnership; developing tools to help pinpoint locations for local authorities to improve networks of greenspaces.

[Stuart A'Hara and Joan Cottrell](#) present some interesting information on the Wheatley Elm, a prominent tree which is unfortunately now in steady decline across the country. They focus on the small number remaining in Edinburgh and the threat of Dutch elm disease.

[Ralph Harmer](#) teams up with fellow FR colleague Gary Kerr to investigate the effect of woodland management on ground flora, and highlight the importance of controlling bramble.

[Louise Sing](#) introduces a new project, Trees4Future, involving a number of FR colleagues and many more experts from across Europe.

[Duncan Ray](#) and FR's Stephen Bathgate have been updating and improving the Ecological Site Classification tool used by foresters and land managers to match species to site conditions. Now available online through the Forestry Commission website there are many new developments to utilise.

As mentioned on the front cover, we round off the articles with a focus on wild boar. [Robin Gill](#) takes us to Italy where populations are under investigation, and to the UK where the effect on ground flora and

invertebrates is being monitored.

We round the issue off with our news and conferences page where we welcome and congratulate a number of PhD students, details of some Forestry Commission publications and a reminder of an upcoming IUFRO conference.

All together these articles highlight a small selection of the current projects we are working on at Forest Research. I hope you find this Autumn 2012 issue of *Ecotype* informative and enjoyable to read.

Claire Noël
Editor

Green network opportunity mapping within the Glasgow & Clyde Valley region of Central Scotland

Darren Moseley

The network of greenspaces in and around our towns and cities contribute an enormous amount to our quality of life, and their importance is recognised within many Government publications. For example, ecological network connectivity is emphasised within the [Natural Environment White Paper](#) and [Scottish Biodiversity Strategy Review](#), whilst planning policy across the UK promotes the use of green infrastructure and green networks to encourage healthier lifestyles, e.g. [National Planning Framework 2](#) in Scotland. In a period of austerity, the challenge for planning authorities is

how to strategically target resources to best enhance green networks for people and biodiversity.

Green Networks for People and Integrated Habitat Networks have been mapped within the Glasgow & Clyde Valley (GCV) Region of Central Scotland, and now the big question is “where are the best places to undertake action?”

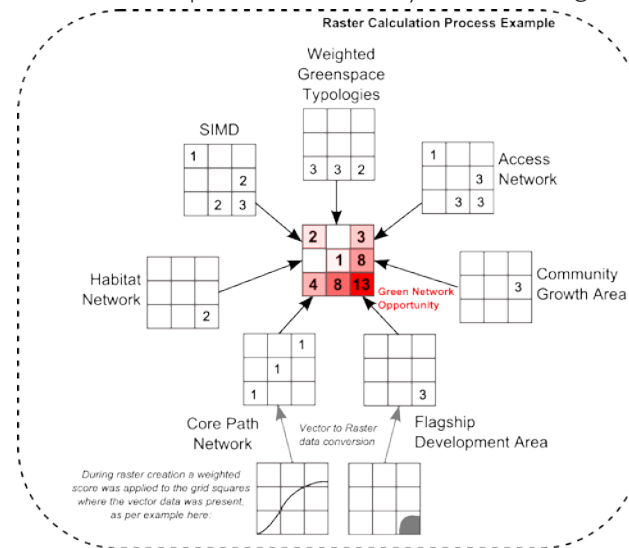


Fig 1. GIS cumulative scoring methodology used to prioritise green network opportunities. Image produced by GCVGNP.

Members of CHES and the Glasgow and Clyde Valley Green Network Partnership developed an approach to identify where effort and resources would best be targeted to give the greatest return on investment, improve network connectivity and address social deprivation. Taking the modelled habitat networks and networks for people, a second level of (heuristic) analysis was applied, using a series of assessment criteria, which identified and ranked opportunities at a regional, strategic level where interventions would have the greatest positive impact on connecting habitats and enhancing access to open space (Fig 1).

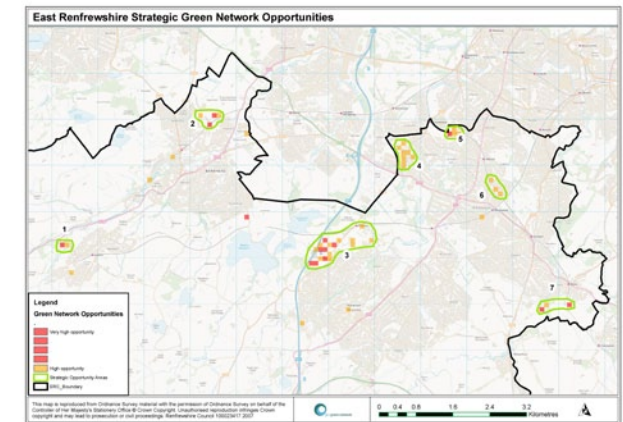


Fig 2. Areas with the highest potential to enhance the green network for people and biodiversity.

The methodology, and resulting output was developed as an integral component of the [Green Network Opportunities Mapping](#) for the GCV Strategic Development Plan and is now being applied by local authorities (Fig 2).

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The Wheatley Elm in Edinburgh

Stuart A'Hara & Joan Cottrell

A recent enquiry received at FR's Northern Research Station (NRS) regarding the degree of clonality in elms provoked CHES scientists to look a little deeper into the complicated taxonomy of our elms in Britain. This uncovered some information of local interest regarding a sub-species of *Ulmus* minor known as the Wheatley elm. Its name derives from a tree planted at Wheatley Park, Doncaster, where it was introduced and propagated in the early 19th century.



The impressive avenue of Wheatley elms in Comiston Road, Edinburgh.

Anyone who travels between Edinburgh and NRS may well pass several specimens of this striking tree and may have wondered about its identity. The tree's compact, columnar form makes it resemble the Lombardy poplar, with long stiff ascending branches forming a narrow pyramidal crown. Notably, it comes into leaf very late and holds its leaves well into November.

The Wheatley elm was once a very popular urban tree and was widely planted in towns and cities across Britain. However, its susceptibility to Dutch elm disease has caused a major decline in its numbers and Edinburgh is now one of its remaining strongholds.

Six specimens are present in Princes Street Gardens and the two in Warriston Cemetery are among the largest surviving specimens in the UK. The finest avenue of Wheatley elms in Edinburgh however, can be seen in Braidburn Park, along the side of Comiston Road. Unfortunately, two Wheatley elms at the entrance to the Meadows have been felled in the recent past after showing early signs of Dutch elm disease. The remaining elms in the city continue to be carefully monitored.

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Sustainable woodland management and the ground flora

Ralph Harmer & Gary Kerr

The UK Forestry Standard, which defines how the principles of sustainable management are applied in the UK, describes the wide range of requirements needed for sustainable management and gives practical guidance on how these may be achieved. The guidance for silviculture implies that stand management using methods with lower impact than clear felling (e.g. [continuous cover forestry](#)) should be used in semi-natural woodland, but it is unclear how effectively they will deliver the other requirements of sustainable management. For example, the biodiversity requirements envisage that woodlands should be managed to conserve or enhance biodiversity – one simple illustration of this is that management should not cause loss of ground flora species present.



Good patch of woodland ground flora including ground ivy and dog's mercury, but what is its future if the bramble also present develops vigorously after felling treatments?

With the exception of coppiced stands, ground flora development in response to woodland management has been poorly studied in Britain. In a recent experiment FR scientists recorded the vegetation in permanent quadrats in semi-natural, neglected mixed coppice woodland with oak standards growing on a fertile clay soil. The

stand was then thinned to create plots with basal areas of c. 12, 16 and 20 m² ha⁻¹. Five years after treatment none of the c. 35 herbaceous ground flora species originally present had been lost from the site with little difference between thinning treatments. This suggests that in the context of the original ground flora herbs, the thinning treatments applied were sustainable. However, regardless of treatment, the ground flora became dominated by a dense thicket of bramble. This had adverse effects on species richness, suggesting that in the longer term species will disappear from the site unless canopy cover develops sufficiently to suppress the bramble thicket.

As bramble tolerates partial shade, thickets are likely to develop and persist in stands managed using continuous cover forestry systems that regularly disturb the canopy, with detrimental consequences for other ground flora species.

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Spatial modelling of provenance regions and future site suitability matching across Europe (Trees4Future)

Louise Sing

Trees4Future is an Integrative European Research Infrastructure FP7 project, due to run until October 2015. It seeks to integrate, develop and improve major forest genetic research and forest research infrastructures to help the European forestry sector respond in a sustainable way to increasing demands for wood products and services in the context of a changing climate.

CHES members Duncan Ray, Louise Sing and Mariella Marzano, with Steve Lee from FR's Centre for Forest Resources and Management, are involved in several work packages and are lead partner of **WP 8: Spatial modelling of provenance regions and future site suitability matching**, which aims to:

- Compile growth trait databases from pan European and national provenance trials for three case study species Ash, Beech and Douglas fir;
- Compile climate data for provenance trial sites to enable the parameterisation of empirical and process-based models linking growth traits with climatic factors;
- Deploy a European climate matching tool for species and provenance selection using specific future climate projections for target sites in Europe;
- Produce guidance on species and provenance for future climate scenarios for different regions of Europe.

Opportunities to access Trees4Future infrastructures

Trees4Future aims to provide better research tools for preparing forests of the future by integrating facilities and tools, and by providing access to their research infrastructures. The Transnational Access programme facilitates external users to gain free access to specific research facilities of 28 project partners spread across 13 countries with

a wide range of expertise. Forest Research is offering site research visits at its Northern Research Station, Roslin, to help develop spatial models on species and provenance suitability. For more information see <http://www.trees4future.eu/transnational-accesses.html>.



For further information please contact:

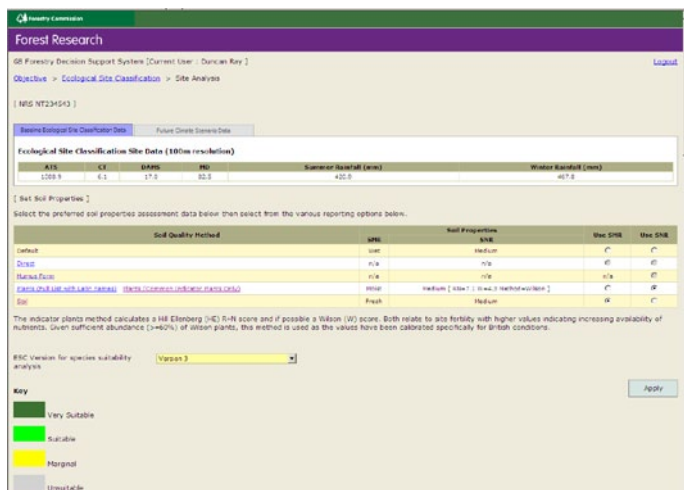
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Ecological Site Classification Version 3

Duncan Ray & Stephen Bathgate

Ecological Site Classification (ESC) (Pyatt et al., 2001) is a forest classification, designed for use at the stand scale, and is useful at the landscape and national scales. It helps foresters match species to site conditions, without the need for extensive ground preparation or fertiliser applications. ESC uses 4 climatic factors (warmth, climatic dryness, wind exposure, and continentality) and 2 edaphic factors (soil wetness, soil fertility) to describe the range of combinations of forest and woodland sites in Britain, and to match species to these sites.

Ecological Site Classification version 3 (ESCV3) is now available as a web application on the Forestry Commission (FC) website. FC users can gain access with a domforestry username and password. External users may access the web applications including ESCv3, but should contact Stephen Bathgate to register to use the system.



Site analysis input summary in ESCv3.

The new version of ESC provides several changes, including: 57 tree species to increase options for species diversity in adapting forests to climate change; links to the projections of future climate in order to check species suitability in the future; links to the tree species notes. The

suitability classification models, expressed as response functions, have been revised to promote less conservative site suitability and yield predictions than previous versions, so ESCv3 is less prone to underestimate productivity on good sites or overestimate productivity on poor sites.

Species (Provenance)	Suitability	Lim. Factor	Trell Index	ATS	CT	DAMS	ESC Factors	SW	SN
Corylus avic.	Very Suitable	HD	4 (***)	Green	Green	Green	Green	Green	Green
Larix laricina	Very Suitable	DAMS	10 (13-14)	Green	Green	Green	Green	Green	Green
Pinus sylvestris	Suitable	DAMS	10 (8-10)	Green	Green	Green	Green	Green	Green
Pinus sp.	Marginal	DAMS	2 (***)	Yellow	Green	Green	Green	Green	Green
Pinus contorta	Very Suitable	HD	0 (***)	Green	Green	Green	Green	Green	Green
Pinus sp. (var.)	Suitable	DAMS	10 (8-12)	Green	Green	Green	Green	Green	Green
Pinus sp.	Marginal	DAMS	4 (***)	Yellow	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	4 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	4 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	10 (***10)	Green	Green	Green	Green	Green	Green
Pinus sp. (var.)	Very Suitable	DAMS	20 (18-24)	Green	Green	Green	Green	Green	Green
Pinus sp. (var.)	Very Suitable	DAMS	4 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	10 (8-12)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (8-10)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	0 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	6 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (8-10)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (***)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	10 (12-16)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (8-10)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	10 (10-14)	Green	Green	Green	Green	Green	Green
Pinus sp.	Very Suitable	DAMS	8 (***)	Green	Green	Green	Green	Green	Green

Species suitability report from ESCv3.

References

PYATT, D. G., RAY, D. & FLETCHER, J. (2001) An Ecological Site Classification for Forestry in Great Britain: Bulletin 124, Edinburgh, Forestry Commission.

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Impacts and monitoring of Wild Boar

Robin Gill

Experience with wild boar in continental Europe indicates that they can be a serious nuisance to farmers, being capable of spreading diseases to livestock as well as causing damage to arable crops. Evidence of their impacts in woodland is more equivocal, with both positive and negative effects reported. Wild boar sows can produce very large litters, a factor which can make populations and their impacts rather unpredictable and difficult to manage. Here in the UK, wild boar numbers, although increasing, are still very low and scattered. In the Forest of Dean, management of the wild boar population has proved controversial, with some stakeholders actively lobbying for a culling programme while others are against it.

In 2008 Forest Research started a [project](#), jointly funded by Defra and the Forestry Commission, to develop methods of monitoring wild boar populations and to assess impacts on woodland biodiversity. The project will continue until 2015.

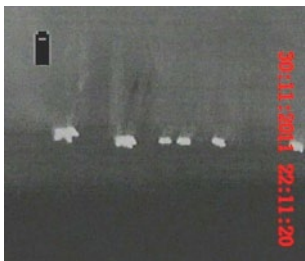


Fig 2. Adult wild boar with piglets in an old meadow, Alto Merse. Several sounders (groups of wild boar) were encountered using these meadows at the same time. Click [here](#) for link to video.

This project has included trials using thermal imaging to obtain estimates of wild boar density using distance sampling, used previously for deer. This involved trials in two sites where wild boar are present in the UK, as well as two in Italy in Alto Merse and Castelvechio, Tuscany. Carrying out the trials in Italy provided an opportunity to work with colleagues from ISPRA (Istituto Superiore



Fig 1. Wild Boar in Alto Merse, Tuscany. Image captured from video taken from a Flir ATS thermo sight camera.

per la Protezione e la Ricerca Ambientale), the Italian Institute for Environmental Protection and Research. The populations in Italy revealed that densities of wild boar can be much higher than typical for the UK but also vary. The objectives of this part of the project were to assess the suitability of different thermal imagers in various environments, and to explore ways of reducing sampling variance to try to obtain more precise estimates.

Some preliminary results of the investigation into the impacts of wild boar has been published in a recent article by Harmer, Straw and Williams, 'Boar Bluebells and Beetles', in the July issue of The Royal Forestry Society's Quarterly Journal of Forestry, p195-202. While it is clear that wild boar can have a dramatic impact on woodlands by rooting extensive areas (fig. 3) the long term effects they have on the flora and invertebrates are not so obvious, and it will take more time and investigation to unravel exactly what these are.



Fig 3. Wild boar rooting on bluebells.

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News and conferences

PhD congratulations

Congratulations to another of the PhD students associated with CHES. Armand Tene successfully completed his PhD at University College Dublin, examining the ecophysiological response of 3 tree species to dry summers across a climatic gradient from West Ireland to Eastern England. The work, co-supervised by Duncan Ray, involved dendroclimatology and stable isotope analysis of earlywood and latewood sections of tree rings before, through, and following drought years.

Two PhD students join CHES

CHES have recently welcomed 2 new PhD students.

Christopher Nichols, jointly supervised by CHES's Dr Robin Gill, and Dr Nigel Goode from the Royal Veterinary College London, will be undertaking a project entitled 'Grey squirrels (*Sciurus carolinensis*) in British woodlands: understanding bark stripping and reproductive biology'.

Annika Telford aims to assess the genetic basis of variation in susceptibility of Scots pine to Dothistroma Needle Blight. She will be jointly supervised by CHES's Joan Cottrell, Richard Ennos from Edinburgh University, and Stephen Cavers from the Centre for Ecology and Hydrology. Additional pathology input will be provided by Forest Research's Anna Brown.

Publications

The economic benefits of greenspace (A critical assessment of evidence). Vadim Saraev. Forestry Commission Research Report. FCRP021.

Recreational use of forests and disturbance of wildlife (a literature review). Mariella Marzano and Norman Dandy. Forestry Commission Research Report. FCRP020.

Marginal abatement cost curves for UK forestry. Gregory Valatin. Forestry Commission Research Report. FCRP019.

IUFRO 2012 Conference

Forest Research and IUFRO will be hosting the 'Managing forests for ecosystem services: can spruce forests show the way?' conference between the 8th and 11th of October 2012 at the Heriot-Watt University, Edinburgh. CHES's Chris Quine, Louise Sing and Anna Lawrence are among the many Forest Research scientists due to speak at the conference.

About 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.

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Web links

www.forestry.gov.uk/fr/ecology

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