

PROGRAMME GROUP RESEARCH UPDATE: Rural & urban landscape ecology programme group

Introduction

Kevin Watts

The purpose of the rural and urban landscape ecology group (ruLE) is to conduct and manage multiple strands of work with a common landscape ecology theme, emphasising the integration of research agendas (including habitat networks and urban greening).

In this issue we highlight work on four current themes:

- Tools to aid targeting and evaluation
- Habitat networks
- Visualisation
- Future directions

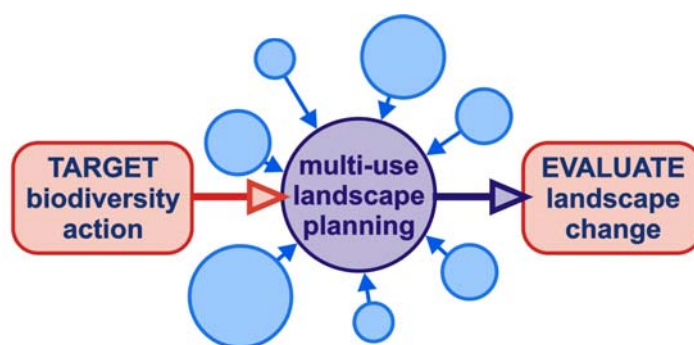
Tools to aid targeting and evaluation

Biodiversity and forestry strategies for the UK countries currently emphasise the importance of adopting a larger landscape scale approach to effectively conserve biodiversity and combat fragmentation; and to integrate these biodiversity goals with other environmental, economic and social objectives in order to plan for multiple benefits within sustainable forest landscapes.

In order to assist planning and policy making at the strategic level, and guide management at an operational level, there is a need to proactively 'target' biodiversity conservation action and to 'evaluate' planned landscape change.

The targeting element should ensure that the appropriate action is applied in the most effective areas, and will support the development of multi-use landscape plans. The evaluation of planned landscape change, which will explore a balance or compromise between the various environmental,

Forest Research 



Flow diagram showing the landscape biodiversity planning process

economic and social objectives, should ensure biodiversity needs are incorporated.

Forest Research is currently developing a suite of tools under the name **BEETLE** – (*Biological and Environmental Evaluation Tools for Landscape Ecology*). These tools are intended to range from those that produce simple measures, or indicators, of landscape structure to more complex tools that measure landscape function. The latter will be represented by the characteristics and requirements of a variety of ecologically representative focal species. The appropriateness of each approach will vary with the particular research or management question, the scale of analysis and the availability of spatial and species data.

The recently published information note [Evaluating Biodiversity in Fragmented Landscapes: Principles](#) explains more and can be downloaded from the Forest Research website. Future Information Notes will demonstrate how these principles can be developed further and applied to real landscape issues both through targeting biodiversity conservation action and evaluating the impact of landscape change on biodiversity.

For more information on the work of ruLE contact:

Kevin Watts

(Contact details at end of next article)

Habitat Networks

Duncan Ray

This is an applied programme of studies linked by the application of the BEETLE model. Each study has a common aim - to develop habitat network plans for woodland biodiversity, management, restoration and expansion at the landscape scale, while respecting the needs of other valued biodiversity (e.g. open habitats).

The work is underpinned by landscape ecology theory and uses focal species methods. The model predicts functional connectivity by examining the dispersal ability of a focal species when influenced by the permeability of landcover elements within the landscape. It is assumed that the non-woodland habitats have a significant impact on connectivity for many woodland species. For example, intensively managed land is considered less permeable than extensively managed and semi-natural land.

This work has been sponsored by:
Forestry Commission GB,
Forestry Commission Scotland, Forestry Commission Wales, Scottish Natural Heritage, Countryside Council for Wales, The Scottish Executive and Scottish Borders Council. The projects below are arranged in chronological order:

Scottish Borders

This project applied BEETLE to quantify the

location and extent of functionally connected woodland and unimproved grassland in three catchments of the River Tweed. The work has now been incorporated in the Scottish Borders Indicative Forestry Strategy. Scotland's Deputy Minister for Environment and Rural Development, Rhona Brankin MSP, recently announced a Locational Premium grant to target new native woodland in the Scottish Borders within areas described in the FHN plan.

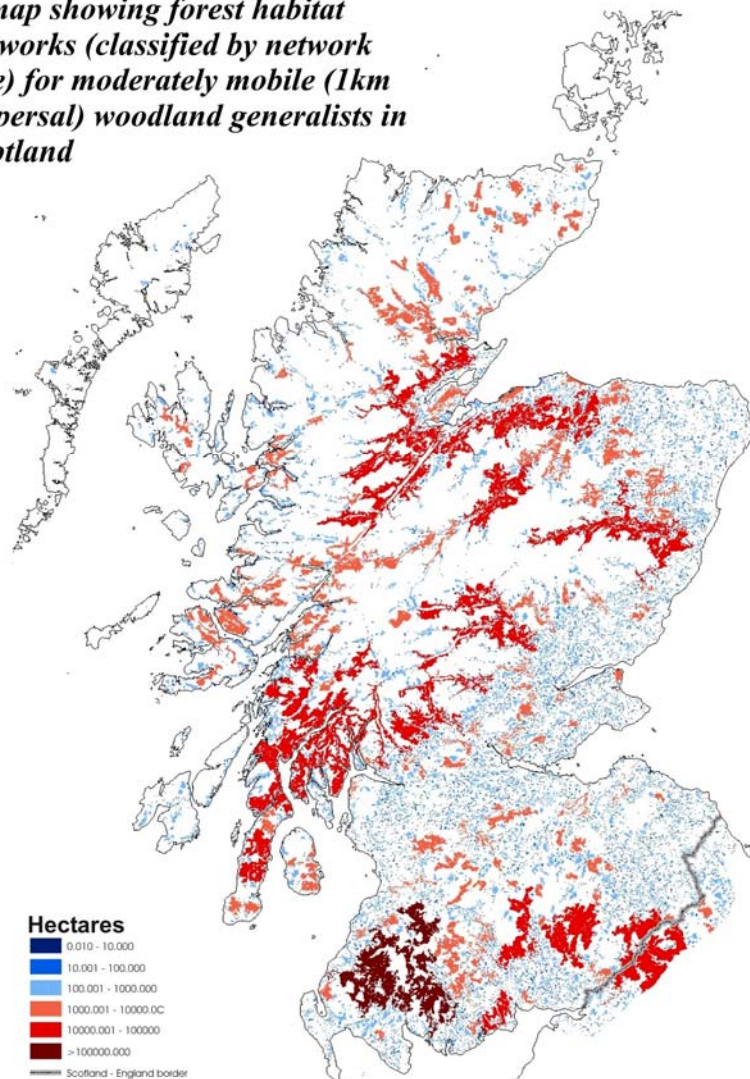
Contact: Duncan Ray

West Lothian

In West Lothian we pioneered the concept and application of generic focal species as a means of

focussing on the relationship between wider biodiversity and landscape processes. The study considered the likely impact of development on existing networks, many of which contain ancient and long established woodland habitat. In conclusion, the report suggests opportunities to help mitigate the negative impact of development on woodland biodiversity within the county. The project has now been expanded to consider habitat networks throughout Edinburgh and the Lothians within the framework of the Structure Plan for the region.
Contact: Duncan Ray

A map showing forest habitat networks (classified by network size) for moderately mobile (1km dispersal) woodland generalists in Scotland



Wales

BEETLE has been applied across Wales using the phase 1 habitat data for Wales and the National Inventory of Woodlands and Trees. The study

produced a series of maps showing the potential extent of habitat networks for ancient and broadleaf woodland, which are high on the priority list for conservation in Wales. The networks are divided into Core Networks (large woodland patches which are closely connected) and Focal Networks (containing smaller habitat patches and a more extensive network). Future management actions will link back to these network components.

Contact: Kevin Watts

Scotland

Forest habitat network plans are now being developed across Scotland. Analyses for woodland generalist species, broadleaved specialist species and heathland generalist species have been completed at the national scale. Habitat networks are now being analysed regionally, from more detailed data. The analysis has been completed for Highland Scotland, and this has led to the testing of a new method for targeting a Locational Premium grant for woodland expansion in the Highlands.

Contact: Duncan Ray

Lowland Scotland

Following a review of approaches to define and develop habitat networks in the lowlands, Phase 2 of the project has been agreed and is being funded by Scottish Natural Heritage, the Scottish Executive, Forestry Commission GB and Forestry Commission Scotland. A method using the BEETLE focal species approach will be tested in 4 case study areas of the Scottish lowlands over the next 2 years.

Contact: Jonathan Humphrey

Balancing Upland and Woodland Strategic priorities

The aim of this work was to allow FC Scotland and Scottish Natural Heritage to give a consistent and integrated response to questions of priority in the balance between open ground and native woodland in the uplands. The project focused on the integration of native (semi-natural) woodland with open ground communities, but also considers the role of plantations. BEETLE was applied to Glen Affric as a case study area to test the impacts of different configurations of open space and woodland on a range of focal species with contrasting habitat requirements and dispersal abilities.

Contact: Jonathan Humphrey

South West England

A small project in the south west of England, funded by the FC South West England Conservancy, aims to demonstrate a potential

approach to target and prioritise areas for Ancient Woodland conservation action in the south west in line with the new FC England Ancient Woodland policy 'Keepers of Time'. The policy seeks to ensure that these woodlands are protected and managed in a wider landscape context.

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Visit the Forest Research website [Habitat Networks](#) pages, which include downloadable reports and maps of the some of the work mentioned above.

VisuLands project

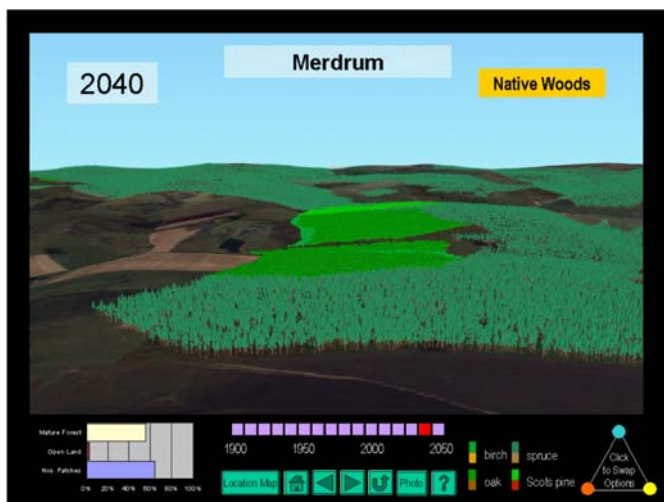
Chris Quine & Max Hislop

VisuLands is a 3-year European Commission funded project which aims to develop computer visualisation tools to support public involvement in the assessment of landscape change. The intention is that the tools should not only allow visualisation of future options for land cover/land management, but should also provide information on how other landscape values (such as biodiversity) might be provided by such a future. It is in the latter study that Ecology Division have been most involved, but colleagues in Environment and Human Sciences Division and in FC Scotland have been considering how beneficial such tools are to public participation. Further information can be found on the [Forest Research website](#).

The project has been co-ordinated by the Macaulay Institute and involves research partners from six European countries. In the UK the project partners are Forest Research and Forestry Commission Scotland. The project will end in December 2005. A key aspect of VisuLands has been the study by

each partner of an area of their country that is, or may in the future, experience landscape change. Forest Research selected three study sites throughout the UK to test landscape indicators (from landscape metrics to BEETLE assessments of habitat networks), visualisations, and perceptions of the end users:

- Clashindarroch near Huntly, north-east Scotland.
- Isle of Wight, off the coast of south-east England
- Clocaenog, north Wales



Screenshot of an interactive presentation showing part of Clashindarroch Forest and one of the Darroch Wids native woodland plantings as they might appear in 2040

Clashindarroch has been the main study site used to test all aspects of the project – including public participation. Since 2003 researchers from the Macaulay Institute and Forest Research have developed computer visualisations of Clashindarroch Forest and the recent Scottish Forest Alliance ‘Darroch Wids’ native woodland plantings. During this time many people from Huntly and the local area have contributed to the project. This culminated in a week-long public event held at Stewarts Hall in Huntly last June, when over 200 local people had a chance to view and give their responses to the visualisations of the forest. To disseminate the findings of VisuLands a one-day conference will be held in Edinburgh at the beginning of December. The objective of the conference will be to increase understanding of the benefits and pitfalls of using landscape visualisations as a tool in participatory processes. We plan to capture the main findings in an FC publication in due course.

For more information on the incorporation of non-visual indicators of landscape quality

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For information on the use of visualisations as a tool for encouraging public participation, contact:

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Future directions

The landscape ecology model BEETLE has been used primarily for forest habitat network planning in a rural context. However a new project will explore the application of the principles to peri-urban areas and also examine

- Opportunities for incorporating more woodland in and around towns to improve social health and well-being by offering opportunities for relaxation away from the stress of city life
- Woodland experience-based and guided education opportunities for young people
- The quality of the urban environment in absorbing noise, dust, CO₂, and water to attenuate peak flood flows from the hard surfaces of towns
- Provision of functionally connected woodland habitats for wildlife.

This project will be funded by:

- Scottish Natural Heritage
- Midlothian Council
- East Lothian Council
- Edinburgh City Council and the
- Forestry Commission’s Woodlands In and Around Towns (WIAT) Challenge Fund

OTHER NEWS

The Neroche Forest Project

This year’s Ecology Division meeting was partly held at the Neroche Forest Project in Somerset’s Blackdown Hills Area of Outstanding Natural Beauty. Gavin Saunders (Project Manager) and Oliver Lucas (Head of Planning, South West England Forest District) led a programme of talks and walks explaining the genesis of this large scale landscape restoration project. The project, led by

Forest Enterprise, has involved extensive public consultation, and is supported by the Heritage Lottery Fund.

The project hopes to:

- Restore, conserve and maintain the unique character of the heritage landscape along with the associated natural habitats of the area
- Improve access to the heritage landscape for everyone to enjoy
- Foster local community involvement in and understanding of the landscape and natural heritage, its restoration and use, with particular emphasis on local schools and the next generation
- Conserve the archaeological and built heritage
- Provide local training opportunities and develop an infrastructure that will encourage diversification and sustainable development
- Ensure that the Project continues to develop and expand after any initial Lottery funding expires.



Neroche - conifer clearance to create a form of open wood pasture

This work will tie in with work carried out by other organisations to enhance biodiversity, public access, heritage and interpretation. Ecology Division hopes to be involved in future monitoring and provision of advice to the project'.

This is a very brief summary of the work involved in the Project. For a full list of partners see www.blackdown-hills.net/neroche4.htm, or for more information contact:

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To achieve these goals, S.W. England Forest District is working in close partnership with several other local organisations. Work undertaken on FC land will include:

- Removal of conifers and restoration to semi-natural woodland
- Introduction of cattle grazing on some areas to promote the creation of wood pasture
- Re-introduction of coppicing on some areas
- Creation of three apprenticeships specifically to work on the project
- Creation of car parks on FC land along the route of a new long distance footpath.

CONFERENCES

Bramble in woodland – bane or benefit

British Ecological Society - Forest Ecology Group Meeting at Westonbirt Arboretum 21st June 2006

Bramble is a widely distributed native species that

occurs within the ground flora of many woodland communities. Foresters often regard the species as a problem weed that can cause significant difficulties for tree establishment, but it is important for wildlife providing nectar, berries and habitat for a variety of different species. The meeting aims to bring together both ecologists and forest managers to discuss the role of bramble in woodland.

The meeting will comprise a morning of short lectures and an afternoon field-visit to woodland where the ground flora is dominated by bramble. The lectures will cover topics including growth, reproduction and taxonomy, and ecology and wildlife. Discussion in the field will concentrate on more practical management issues.

After the meeting there will be an opportunity to take a guided tour of the Arboretum.

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PUBLICATIONS



New Ecology Division publication:
Bryce, J.; Cartmel, S. & Quine, C. P.; 2005. Habitat use by red and grey squirrels: results of two recent studies and implications for management

This can be downloaded from the FC website at: www.forestry.gov.uk/publications

Or ordered from:
Forestry Commission Publications
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Wetherby
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LS23 7EW
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