

# Biotype

The Biodiversity & Conservation Newsletter of Woodland Ecology Branch

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## RESEARCH UPDATE

### An Overview of Landscape Ecology Work at Clocaenog Forest, North Wales Kevin Watts

The Landscape Ecology Project aims to improve our understanding of how forest management affects biodiversity at the landscape scale, and to translate this into practical management guidelines. Clocaenog forest is one of three sites where detailed studies are currently being undertaken, in conjunction with local FE staff and specialist wildlife surveyors.

Clocaenog Forest (near Ruthin, Denbighshire)

- Covers an area of approximately 5500 ha. and is dominated by managed stands dating from the early 1900s.
- Stands contain a range of species, but are dominated by conifers, mainly Sitka Spruce, with some Norway Spruce and Scots Pine.

The current forest management includes

- Clear-felling and restocking.
- Introduction of continuous cover silviculture.
- Management of open ground.
- Management of riparian corridors.

Initial research has focused upon the effects of forest management on habitat availability and suitability for three species of conservation concern:

- Black grouse (*Tetrao tetrix*).
- Red squirrel (*Sciurus Vulgaris*).
- Small pearl-bordered fritillary (*Bolaria selene*).

Detailed field surveys of habitat use by the selected species are being carried out to establish

- Distribution patterns.
- Suitable habitats.



- Key landscape features (either encouraging or limiting dispersal).



**Black grouse** use open areas associated with clear fell and restock operations within the forest boundary. This has resulted in a transient population that colonises suitable habitat areas over a period of 2-10 years. The creation of suitable habitat in the

forest provides an opportunity to stabilise the population by linking existing habitat patches within the forest with open areas in the surrounding landscape.



**Red squirrels.** The forest has both red and grey squirrels. The greys spend most of their time in broadleaved areas, except in years of high conifer seed production, when they feed in the coniferous areas favoured by the reds. It is hoped that a viable population of

red squirrels can be maintained by controlling grey squirrel immigration.

The Forest Enterprise sub-compartment database was used to calculate the suitability of areas for red squirrels. Each sub compartment was given a suitability index according to tree species and age. Using restock information these maps can be used to show the areas which may become potential red squirrel habitat.

**The small pearl-bordered fritillary** typically occurs in areas with an unbroken supply of sunny habitats, damp, open deciduous woodlands with a continuous history of coppice or underwood management. It can also be found in areas that have been extensively cleared and replanted with conifers.

The butterfly appears to be thriving as a metapopulation (a set of sub-populations actively in contact with each other) within recent clear-fells near streams, or boggy

areas where marsh violets (the specific food plant) are abundant in damp, grassy vegetation. Although sedentary, they appear to be capable of dispersing throughout the forest, and provide a good model to examine the impact of landscape-scale forest management.

### **Habitat Suitability Models**

These three species highlight potential conflicts in managing forests to meet biodiversity objectives. For example, the creation of open areas for black grouse must be balanced against the need of red squirrels for large areas of suitable conifers.

Data from fieldwork will be combined with information on species ecology to build habitat suitability models. Habitat variables such as structure, composition and spatial pattern will be used to build the models, which will be able to show the distribution of optimal, sub-optimal and unsuitable habitat for each of the key species. These models will serve as a foundation for a GIS based decision support system, which will be developed in close consultation with potential end-users. This system will allow foresters to study the implications of management options for species of conservation concern.

**For more information on the Landscape Ecology Programme, contact:**

**Kevin Watts**  
**Woodland Ecology Branch**  
**Forest Research**  
**Alice Holt**  
**Tel: 01420 22255**  
**E-mail: [kevin.watts@forestry.gsi.gov.uk](mailto:kevin.watts@forestry.gsi.gov.uk)**

### **Project Rivfunction** **Jonathan Humphrey**

The first meeting of the EU funded 5<sup>th</sup> Framework project RIVFUNCTION was held in Toulouse, France, 17-21 April 2002. RIVFUNCTION stands for *Integrating Ecosystem Function into River Quality Assessment and Management*. EU countries are in the process of signing up to the European Parliament **Water Framework Directive** (WFD), the aim of which is to establish a framework for the protection and sustainable management of European waters. The WFD specifically identifies the need to "maintain and improve the ecological quality" of waters and to "enhance the status of aquatic ecosystems".



### **Measuring Ecological Quality**

A substantial part of the WFD assessment of "ecological quality" includes the

measurement of ecological functioning, in other words, processes such as decomposition and nutrient cycling. The problem is that most countries have not developed methods for assessing ecological functioning within aquatic ecosystems. This is where RIVFUNCTION comes in. The three-year project aims to develop a tool for assessing decomposition rates within rivers throughout Europe. The breakdown and decomposition of litter and organic material within rivers is an essential primary process upon which depends a host of other ecological processes, such as the provision of food and habitat for aquatic flora and fauna.

Rates of decomposition are greatly influenced by pollution such as eutrophication and changes in land-use within the riparian zone e.g. loss of woodland. A well-tested tool of assessing decomposition rates is to use mesh bags filled with leaf litter and monitor loss of biomass over time. The principle agents of decomposition, (fungi and invertebrates) can also be assessed using this technique. RIVFUNCTION's challenge is to develop a variant of the leaf bag tool flexible enough to be applicable across the whole of Europe. It must be robust and simple enough to be used by non-specialist end-users (such as forestry organisations and water agencies), and sensitive enough to detect changes in decomposition rates in relation to land-use change and pollution levels.

### **Who Runs Rivfunction?**

RIVFUNCTION is co-ordinated by Eric Chauvet of the CESAC (Centre d'Ecologie des Systèmes Aquatiques Continentaux). Another 7 countries are represented on the partnership. Forest Research (represented by Jonathan Humphrey) is one of the main partners and at the first meeting was invited to be the end-user co-ordinator. Our role will be to ensure that the decomposition assessment tool is designed with the end-user in mind, and that the results of the project are communicated effectively in a non-technical format to end-users. In addition to further project meetings in Switzerland and Sweden, there will be within-country meetings. These will provide opportunities for wider participation and input; details of the next UK meeting will be posted in future editions of *BIOTYPE*.

**For further information contact:**

**Dr Jonathan Humphrey**  
**Woodland Ecology Branch**  
**Forest Research**  
**Northern Research Station**  
**Tel: 0131 445 2176/6972**  
**E-mail: [jon.humphrey@forestry.gsi.gov.uk](mailto:jon.humphrey@forestry.gsi.gov.uk)**

## Forest Enterprise Bat Survey

Andy Brunt

Further to the short news item in February's Biotype on the **Agreement on the Conservation of Bats in Europe**, collation of Forest Enterprise survey information was recently completed.

The total number of bat boxes in FE forests is around 3684, with at least 590 boxes planned for the future. Bats were also the subject (either exclusively or a major part of) 151 talks, walks or visits. There are currently 22 artificial hibernacula, ranging from old air raid shelters to concrete hibernation boxes. There are also at least 378 known hibernation sites, with several Districts suggesting there are probably many more. All British species are represented in British forests, including the rare greater and lesser horseshoe, Bechsteins and barbastelle bats.

The results of this survey have been sent to DEFRA to help produce the UK's annual report on bat conservation activities, which should soon be available on the Eurobats website. WEB will soon be sending a full spreadsheet of the survey's results out to all Forest Districts.

**For more information on the survey, contact Andy Brunt (see address at end of newsletter).**

## CONFERENCES

### Restoring Planted Ancient Woodland Sites

Sian Thomas

"Restoring Planted Ancient Woodland Sites", a conference organised by the Woodland Trust and British Ecological Society, will be held at Warwick University on 18 and 19 September 2002. Speakers from Forestry Commission, Oxford Forestry Institute, English Nature, Woodland Trust and others. Since the 1930s, nearly half Britain's ancient woodland has been felled and replanted, much of it with non-native conifers. Interest in restoring these sites has been growing. The UK native woodland Habitat Action Plans require some restoration, as do timber certification schemes. This conference will study the implications for policy and practice of recent research by Oxford Forestry Institute into the ecological and economic effects of restoring planted ancient woodland sites.

**To book contact:**  
**Anna Fisher**

Woodland Trust

Tel. 01476 581111,

E-mail. [Annafisher@woodland-trust.org.uk](mailto:Annafisher@woodland-trust.org.uk)

## STUDY TOURS

### European & African Study Tours

Clark Mactavish Limited will be running forestry based study tours to several destinations in Europe and Africa in the coming year.

Subjects for the tours will include:  
Management of habitat for large carnivores.  
Forest management for environmental benefits.

Both of these tours will be to the Czech Republic

**For further information contact:**

**Clark Mactavish Limited**

**Tel: 016973 21516**

**Fax: 016973 23040**

**E-mail: [Enquiries@clark-mactavish.co.uk](mailto:Enquiries@clark-mactavish.co.uk)**

## CONTACT DETAILS

**To provide material for future issues, or if you wish to receive Biotype by e-mail, get in touch with:**

**Andrew Brunt**

**Woodland Ecology Branch**

**Forest Research**

**Alice Holt Lodge**

**Wrecclesham**

**Farnham**

**Surrey**

**GU10 4LH**

**Tel. 01420 22255**

**Fax. 01420 520180**

**E-mail**

**[andrew.brunt@forestry.gsi.gov.uk](mailto:andrew.brunt@forestry.gsi.gov.uk)**

**For General enquiries concerning the work of Woodland Ecology Branch, contact:**

**Chris Quine**

**Woodland Ecology Branch**

**Forest Research**

**Northern Research Station**

**Roslin**

**Midlothian**

**EH25 9SY**

**Tel. 0131 445 2176**

**Fax. 0131 445 5124**

