Biotype

The Biodiversity & Conservation Newsletter of Woodland Ecology Branch

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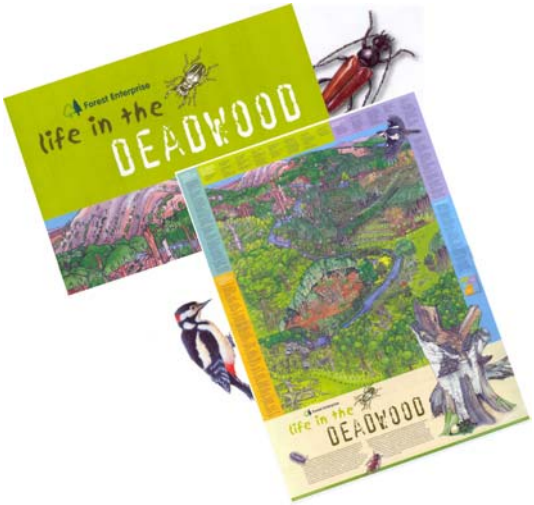
"Life in the Deadwood"

Jonathan Humphrey



Forest Enterprise will shortly be publishing a guide to the management of deadwood within its estate. The need for the publication arose out of the recent certification audit of FE forest management, where lack of current guidance on deadwood provision was highlighted. In addition there is a need to raise the general awareness of the importance of deadwood for biodiversity conservation in both planted and semi-natural woodland.

The purpose of the guide is to:

- Inspire those who are required to implement current deadwood guidelines at both the forest planning and operational levels.
- Illustrate how deadwood habitats can best be created and enhanced within different types of managed forest.
- Help with the production of local deadwood plans.
- Encourage all those who have an interest in the management of deadwood to make the best of opportunities when they arise and to develop a long-term perspective.
- Support Forest Enterprise in its aim to undertake sustainable forest management to the UKWAS standard and ensure that its wood products carry the FSC green label.

The guidance comprises a booklet and an accompanying poster tucked into the rear cover. A web version is also planned. The production of the guide was very much a team effort, with FR staff (Jonathan Humphrey) linking with a graphic illustrator (Janet Swailes) under the leadership of Alan Stevenson (FE Environment and Communications Branch). The concept was to produce an eye-catching, colourful publication with concise and straightforward take-home messages for forest managers and operational staff linked to specific woodland types and situations. Also included is some in-depth scientific rationale for some of the deadwood recommendations. The science was based on current research results from FR's Biodiversity Assessment Project as well as other research projects at home and overseas.

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For information on training courses running around the country for forest managers and operational staff, contact:

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Restoration of PAWS
Ralph Harmer

Three new experimental sites were established in 2001 to investigate the restoration of Plantations on Ancient Woodland Sites to native broadleaves. These form part of the programme of research into Lowland Native Woods and observations will concentrate on the regeneration of woody plants and the development of the ground flora.

Experimental Sites

- **Fineshade** (Forest Enterprise). A stand in Northamptonshire dominated by Corsican pine that has been managed and cleaned. There are few residual broadleaved trees most of which are small, suppressed specimens growing along the side of drainage ditches. The ground flora is dominated by bramble although there are some patches of grass and areas of bare ground. Browsing by deer is significant.

- **Chiddingfold** (Forest Enterprise). This is a recently thinned stand of Corsican pine in Surrey that has a small number of broadleaved trees, principally ash, scattered throughout. Although there are some dense patches of advanced regeneration, tree seedlings are generally sparse. The ground flora is varied with a good range of species. There is evidence of deer browsing across the whole site.

- **Wakehurst** (Royal Botanic Gardens). This stand in East Sussex is a mixture of Corsican and Scots pines with a reasonable number of broadleaved trees occurring throughout, primarily ash in the overstorey and hazel in the understorey. There are some dense patches of ash advance regeneration but the seedlings are generally small. Where the canopy is open the ground flora is dominated by bramble, but a majority of the forest floor is bare. The site is fenced, and although muntjac can gain access via badger gates, browsing damage is light.

The treatments and observations made at each site vary but the studies aim to gather information on the establishment, growth and survival of trees and shrubs, in relation to thinning treatment and the ground flora, which develops.

Initial observations have been made, including the following:

- Basal area and canopy cover prior to thinning.

- Species present in the ground flora and their abundance.

- Numbers and sizes of tree seedlings present.

The basal area data were used to mark trees in the different thinning treatments, and to remove known proportions of the crop.

The assessments will be repeated annually for 3 – 5 years during which period further experimental sites may be established.

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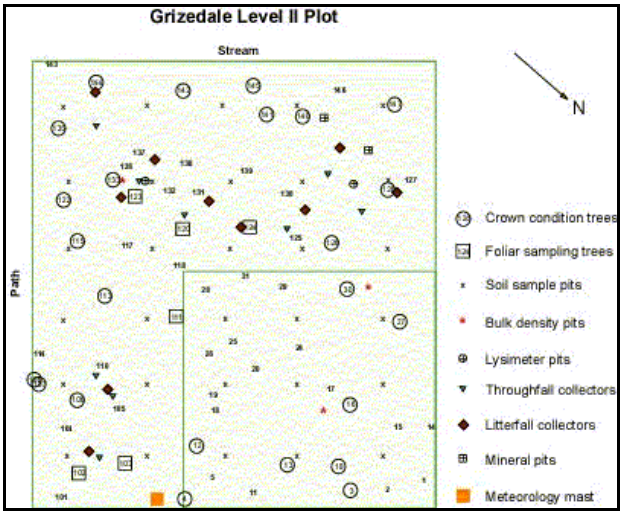
How Healthy is Your Forest? The Importance of Environmental Monitoring
Andy Moffat (Head, Environmental Research Branch)

Many are aware that every year surveyors go out to assess the crown density of sample trees in forests across Britain in order to evaluate 'forest condition'. The results have been reported in Forestry Commission Information Notes for several years now. These surveys have been invaluable in demonstrating the trends in crown condition, and qualitatively identifying possible causes for the inter-annual variation observed. However, on their own they cannot properly identify the factors which determine tree or forest health – for this, it is necessary to monitor the range of environmental parameters which may affect the forest, such as atmospheric pollutants or climate. In addition, forest health is more than just the appearance of the tree crown, so it is important to measure forest growth and productivity, and the quality of the soil, and water draining from the forest. The biodiversity of the forest is another significant factor in a rigorous evaluation of forest (ecosystem) health.

These issues are currently assessed continuously in the UK intensive monitoring programme (commonly known as 'Level II'), part of a pan-European Programme involving 37 countries. There are currently ten sites in Great Britain covering oak, Scots pine and Sitka spruce, with plans for extension to beech and Norway spruce in 2002. The monitoring programme has been in existence since 1994, and is run from the Environmental Research Branch at Alice Holt, supported by colleagues in the Technical Support Units, and the Woodland Ecology, Mensuration, Pathology and Entomology Branches. As well as measurements of tree growth and condition, climate, soil, water, atmospheric pollutant inputs, ground vegetation, litterfall, foliar chemistry and phenology are also recorded. There are plans to extend measurements to include important insect populations soon. The figure shows the layout of a typical plot.

The monitoring programme was originally set up to try to quantify the effect of atmospheric pollution on forest productivity and health. But it is now seen as valuable as a source of good quality data to inform on other issues such as:

- The effect of climate change on forests,
- Quantifying carbon sequestration,
- Monitoring ground vegetation compositional change,
- Evaluating the effects of harvesting and timber removal on future site productivity,
- An early warning system for potential water pollution,
- Assessment of soil quality, and
- Providing information for Sustainable Forest Management Criteria and Indicators.



Because almost all the most important environmental and silvicultural parameters are measured at each site, they are already showing their worth as platforms for other research projects, and for their potential to inform on modern policy issues. So, for example, the site at Sherwood has been used to help establish the degree to which elevated carbon dioxide and nitrogen pollutant concentrations in the atmosphere have already helped increase tree growth across Europe. The site at Thetford has been important in supplying data to help demonstrate that forestry practices which involve the removal of tree stumps at clearfell are sustainable. This has been used as part of the UKWAS accreditation process. At Alice Holt and Coalburn in Kielder Forest, a better understanding of the water use of forests has been gained.

We wish to promote the Level II network as a significant resource for interested parties to use. This may include forest managers and researchers alike. The Environmental Research Branch is currently engaged in a detailed programme of data evaluation, and results will be reported from time to time. But we welcome approaches from anyone who wishes to learn more about the potential of the Level II database (called **FRED** – the **F**orest **R**esearch **E**cosystem **D**atabase), or who might like to use the network for research purposes.

For further details on Environmental Monitoring, download the Forestry Commission Information Note:
http://www.forestry.gov.uk/website/PDF.nsf/pdf/fcin37.pdf/$FILE/fcin37.pdf

To discuss or learn more about the Programme, please contact Andy Moffat or Dave Durrant:
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Genetic Studies in British Oakwoods

Joan Cottrell, Tree Improvement Branch

For the past five years the molecular group at NRS has been studying various aspects of genetic diversity in British oakwoods as part of two major EU funded projects. The initial work involved a large survey of the variation in chloroplast DNA in ancient oakwoods in Britain. Chloroplast DNA is maternally inherited and is useful for determining the postglacial routes of colonisation of a species. This study showed that Britain was colonised by descendants of oaks which had spent the last glacial period in refugia in Spain. The exceptions were the woods in the Forest of Dean, which had chloroplast DNA types typical of oaks from refugia located further east in Europe. Subsequent work has studied this area in more detail to determine whether these oaks occur naturally or have been transported to the area by man.

An additional study has analysed nuclear variation in detail in a single oak wood. The aim of this study was to determine

whether genetic diversity in a wood is randomly distributed or whether it shows some distinct patch structure. Such a structure could result from microsite selection effects or restricted seed or pollen flow. The results showed only a very weak degree of genetic structuration which is the expected result in a wind-pollinated species like oak.

We are now using molecular tools to determine the paternity of acorns and seedlings. This will provide data for models of pollen and seed dispersal distances to be constructed.

These results will help in developing informed policy on the conservation of native woodlands.

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Bat Conservation in Forest Enterprise Forests

Andy Brunt

Forest Research is collating a survey of Forest Enterprise Districts looking at the extent of bat-related work currently taking place. The collated results will be sent to DEFRA's European Wildlife Division, who will forward the results, along with the results from many other UK organisations, to the Eurobats Secretariat in Bonn.

The Secretariat was established by the **Agreement on the Conservation of Bats in Europe** in 1994. The agreement has been signed by 24 EC states including Britain, and aims to protect all 37 species of bat identified in Europe by a combination of legislation, education and conservation measures.

The results of the survey of bat-related activities in the UK are used to build up a picture of the extent of these activities throughout the whole of Europe, and will contribute to the establishment of international conservation programmes for the most endangered European species.

For more information on the Agreement visit www.eurobats.org

CONFERENCES

Biodiversity Research in Scotland – Challenges, Progress and Successes Royal Botanic Garden, Edinburgh

27th-28th March 2002

This meeting will provide a forum for those involved in biodiversity research in Scotland (whether resident there or not). A mix of invited papers, offered papers and posters will be presented, covering a wide range of habitats and species, as well as the funding and organisation of the Biodiversity Action Plan process.

Poster presentations are welcomed.

For further information and registration forms please contact
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11th IALE Conference. Avian Landscape Ecology: Pure and Applied Issues in the Large-Scale Ecology of Birds

10th-13th September 2002, University of East Anglia, Norwich, UK

This conference aims to address a range of issues concerning the spatial ecology of birds at a variety of scales. Any study considering bird distributions in relation to macro- and micro- habitats and in relation to other species (e.g. predators, prey, competitors) is relevant to this conference. Speakers will include Prof. Bill Sutherland (University of East Anglia), Dr Rob Fuller (BTO), Prof. Steve Ormerod (Cardiff University), Prof. Kevin Gaston (University of Sheffield), Dr Shelley Hinsley (CEH) and Dr Rex Sallabanks (Sustainable Ecosystems Institute).

Details from Dan Chamberlain, e-mail dan.chamberlain@bto.org or from the IALE web site: www.iale.org.uk/avian1.html

STAFF NEWS

Dr. Kevin Watts joins Woodland Ecology Branch

I have just (*7/1/02*) joined the Woodland Ecology Branch at Alice Holt as Landscape Ecology Project Leader as a replacement for Richard Ferris. My recently completed PhD (*funded by ESRC*) is particularly pertinent to this position in that it examined the barriers to, and opportunities for, implementation of landscape ecological plans for biodiversity conservation in the wider countryside. This research incorporated both natural and social scientific elements, reflecting the wider objectives of the Forestry Commission. More specifically in terms of this project, my thesis provided me with a valuable insight into landscape ecological principles. This knowledge was used to define landscape objectives, for three case study areas (Culm, Exmoor and Blackmore Vale), with the aim of conserving distinct landscape components (patches, buffers, corridors and matrix) which underpin key ecological patterns and processes. For further details of my research visit: **www.glos.ac.uk/el/ccru/staff/students/kwatts.htm .**

I have been an active participant in the International Association of Landscape Ecology (*IALE*) since 1996, attending National, European and International conferences. In 1999 I presented a paper at both the IALE World Congress in Colorado, USA and the national IALE conference in Bristol. In the latter stages of my PhD I also worked for DEFRA, dealing with the processing and issues of Foot and Mouth movement licences.

Landscape ecological concepts have also been relevant to previous studies and work. For instance, my undergraduate dissertation used regression modelling of species-area relationships, drawn from island biogeography, to evaluate 67 semi-natural woodlands in Somerset. More recently, in my contracts for the Environment Agency, I examined the spatial distribution and dispersal of invasive plants and *Phytophthora* in the Bristol Avon catchment. In more general terms, I have knowledge of ecology and forests from both an academic perspective, as a student, lecturer, and researcher (*Community Forests*), and in a practical capacity as a habitat surveyor (*Somerset Environmental Records Centre*), consultant and practical conservationist (*Somerset Wildlife Trust*).

I am now keen to apply my experience and skills and I hope this position will give me the opportunity to take forward the excellent landscape ecology work started by Richard Ferris and Karen Purdy. I look forward to meeting you all in due course and learning of your research.

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Contacting Biotype:

In common with other Forestry Commission newsletters, we will be distributing Biotype electronically within the FC from this issue onwards. If anyone within the FC would prefer to receive a hard copy, please let us know your name and mailing address.

We will continue to send paper copies to all those outside the FC, but if you would like to receive Biotype by e-mail, please send in your address and we'll put you on the electronic distribution list.

We'd also like to invite correspondence. Please write if you have any questions or points to make about items appearing in Biotype. We also have a guidance note for those interested in contributing to Biotype. Contact:

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