

The Soils Lead Co-ordination Network was established by the Joint Nature Conservation Committee to bring together the views and expertise of the country nature conservation agencies and provide a common approach to UK issues.

## Welcome

Welcome to the second issue of the Soils Lead Co-ordination Network newsletter. Since our previous issue of May 2002, the momentum in soil protection issues has been steadily increasing both at the national and European level.

At a national level, the nature conservation agency interests and soil expertise have become more clearly established in the mind of government and non-government organisations. The balance of soil expertise in the agencies has also changed with emerging expertise in all three country agencies. This has accompanied by a change from a Soil Lead Agency status to a Soil Lead Co-ordination network (LCN) at the beginning of the new financial year (April 2003). The responsibility of the new LCN will not fundamentally change rather being more rational in allowing individual country agencies to undertake work that is best done by them and allowing SNH who will chair the LCN to focus on more generic issues relevant to all the countries.

Such generic application will include co-ordination of advice to DEFRA and government agencies in respect to UK and international soil issues. The involvement of the LCN in Phase II of the development of the European Soil Protection and Sustainable Use Policy is a direct consequence of such action.

But raising awareness to soil conservation needs, both within and outside conservation agencies is an important task. Active links with

other LCN groups should seek to raise importance of cross-cutting roles of soil in terrestrial ecosystems, supporting habitats and biodiversity. Collaboration with other governmental bodies (e.g. SNIFFER, SEPA) is also key to development of cross cutting approaches to soil conservation.

This newsletter gives a brief overview of the work of the Soils LCN in the past year and presents current soils issues relevant to the natural heritage. We hope to raise awareness of soil issues in the country agencies and promote interdisciplinary dialogue. We would very much welcome any comments or contributions to future newsletters of the Soils Lead Co-ordination Network.

[Patricia Bruneau](#)

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## Soil Protection Strategies

### European Soil Policy

Following the publication of the EU Communication "Towards a Thematic Strategy for Soil Protection" on 16 April 2002 (COM(2002)179), the Commission will present in 2004 a thematic strategy on soil protection.

The thematic strategy will consist of a proposal for legislation on a Community information and monitoring system on soil as well as a set of detailed recommendations for future measures and actions. The monitoring system will build on existing information systems and databases and ensure a harmonised way of establishing the prevailing soil conditions across Europe.

From the 8 major threats to soils identified in phase I, COM(2002)179, (erosion, organic matter decline, contamination, sealing, compaction, decline in biodiversity, salinisation and floods and landslides), three priority threats have been identified as requiring immediate actions; erosion, organic matter decline and contamination. Together with research and monitoring, these priority areas were selected to form the framework for a series of technical working groups and an advisory forum to support the policy development.

Patricia Bruneau (SNH) represented the Soils LCN at the stakeholders' meeting in Brussels 10 Feb 2002 to present the views and concerns of the UK nature conservation agencies on soil protection issues.

Following this meeting, Patricia Bruneau has been nominated by DEFRA to the "soil monitoring" technical working group, on behalf of the Soil LCN. If this application is successful, this will ensure representation of nature conservation issues at an early stage in development of EU soil protection and will impact of direction of national policy strategy.

Other nominations include representative from EA, National Soil Resources Institute, SEPA and Science Directorate of DEFRA.

### England

DEFRA consultation paper on [Soil Action Plan for England](#) has led to the development of two projects.

**Soil-monitoring framework;** A new project "WT05002: Identification and development of a set of national indicators for soil quality" has been initiated to develop a soil-monitoring framework, to help co-ordinate and influence monitoring activities that relate to soil. Ensuring that monitoring activities are better targeted at the requirements of policy and soil protection, and improving value for money.

**Soil research audit (CTE0211) (SP0524):** This on-going project should be completed by Oct. 2003. A full soil research audit at a programme level, to assess the current state of UK soil research programmes as a whole.

### Wales

The Welsh Assembly Government (WAG) is making good progress with the production of a soil strategy for Wales. The results of a scoping study to inform development of a soil strategy was reported in October 2002 (<http://www.bangor.ceh.ac.uk/English/science/reports.htm>) and the final strategy document is expected to be published and launched by end April 2004. CCW's Soil Scientist/Policy Advisor (Dylan Williams) is a member of the strategy project team. The strategy will provide the Assembly with clear policy recommendations to help ensure the sustainable use of soils in Wales. The WAG, CCW and Environment Agency Wales (EAW) have recently started work on producing a diffuse pollution action plan for Wales and the developing soil strategy will provide input in considering diffuse pollution to and from soils.

On 31<sup>st</sup> March 2003, Dr Malcolm Smith (Chief Scientist & Senior Director) gave a paper to Council members on the implications for CCW of soil protection policy developments in EU and UK (CCW P 03 10). The paper was well received

with Council supporting CCW's continued participation in the development of soil protection policies and endorsing an extended role in soil conservation work for CCW as required by the WAG and Europe. Council agreed that agri-environment schemes offer opportunities for soil audit and protection and that CCW should seek to influence other policies to protect soil as part of its wider objectives. Council were particularly keen to see stronger links between soils work and the planning policy team at CCW.

The latest State of the Environment Report by CCW, EAW and FCW is due for publication in 2003 and the section on soil quality and contamination will describe what is being done to improve the state of the Welsh soil resource

### Scotland

There has been little progress with a Soil Strategy for Scotland following the scoping study published in 2001. ([Adderley et al. 2001](http://www.envsci.stir.ac.uk/spstrategy/SPreport.pdf), <http://www.envsci.stir.ac.uk/spstrategy/SPreport.pdf>)

SEPA and SNH are jointly planning a workshop on soil issues relevant to Scottish and European perspectives and are seeking the support of the Scottish Executive in this. This should provide a framework for a discussion and expert forum to support future development on soil strategy and policy.

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## Research Projects

The Soils LCN supports a small programme of research on soils and nature conservation issues.

### Moor House Project

The impact and potential of moorland management has been a key research theme at Moor House NNR. Moorlands form the largest extent of undeveloped wildlife habitat remaining in England, and although widespread in the UK, are of international importance. The use of rotational burning as a management tool intensified during the nineteenth century and has been systematically practised ever since. While its use on dry heaths can be justified, the need to burn wet heaths and blanket bog is disputed due to the ability of the wet heaths and blanket bogs to self-regenerate.

This research project, co-funded by JNCC and University of Reading and supervised by Dr. S. Nortcliff and Prof. V. Brown, focusses on peats, the dominant soils associated with moorlands. The work, which started at the end of 2002, will compare selected properties of peat under unburnt, healthy vegetation and different burning regimes, both with and without grazing. This will be used to answer a series of key questions.

- Do soil properties vary in their resilience to change?

- Once the thresholds for change have been achieved, how quickly do soil property changes take place?
- Are the changes reversible, and if so at what rate does the reversal take place?
- At what stage do changes become irreversible?

Use will be made of a long-term experiment set up in 1954 to study the effects of burning and grazing management on bog vegetation at Moor House. This included plots that have been burnt on 10-year rotation, 20-year rotation and not burnt since 1954.

Previous soil survey work at Moor House has led to the classification of peat deposits based upon the phytosociological communities they support.

In the first phase of the project comprehensive soil profile descriptions will be made for the sites identified by phytosociological analysis. This includes a range of biological, chemical and physical properties and will provide valuable information on the nature and rate of change of soils under different management regimes.

That information will form the basis for the development of models to predict the changes in soil properties in response to management practices. Upland moorland communities at other sites in the UK will

provide the opportunity to test the predictions of the model.

For further details contact: Elisabeth Rees  
[e.rees@reading.ac.uk](mailto:e.rees@reading.ac.uk)

### **Snowdonia pilot studies**

This project is similar in nature to the Scottish pilot study on the “distribution of semi-natural soils in Nature Heritage Zone”. Both studies address the issues of spatial distribution and rarity in particular, but are constrained by the underlying soil data used. The Snowdonia study would look at not only the distribution aspects but also the functional aspects, in particular to assess the soil resource in terms of the potential for habitat restoration and its resilience in the face of climate change. However, due to limited resource there are been no further progress on this project.

For further detail contact: Dylan Williams at Countryside Council for Wales  
[dl.williams@ccw.gov.uk](mailto:dl.williams@ccw.gov.uk)

### **Economical value of soil in nature conservation**

The Soils LCN has initiated discussion on how to assess the value of soil resources in the context of nature conservation.

In order for nature conservation to be given appropriate consideration in the development of soil strategies, adequate definition of the role of soil and a framework to interpret the values of specific soil type and functions need to be established.

The major challenge to the definition of soil values lies in the difficulty of separating the values that lie in the soil ecosystem itself (intrinsic values) and the values associated with biota supported by the soil and their associated ecological roles (functional values).

Criteria to assess soil values will reflect both functional and intrinsic roles of soil and will often be overlapping. They will refer to:

- Support of habitats & species
- Biodiversity
- Naturalness / current impacts
- Representativity of unit
- Fragility: response to stress
- Interface function: buffer / filtering
- Biofunction : C and nutrient cycle

- Position in catena
- Recorded site history
- Repertoire of paleoenvironmental information
- Benchmarks for monitoring
- Intrinsic appeal

The values more likely to be associated with conservation issues will be related to the key roles play by soil in supporting natural ecosystem functions. This is important in the context of both maintenance and restoration of semi-natural habitats.

The economic value of soil in term of environmental and ecological services is also a big unknown. Although some work has been conducted on the determination of the economical value of the environment (Costanza et al. 1997, Nature 387, 253-260, Williams et al. 2002 Quarterly Economic Commentary) , there is little on valuation of soil. Using a similar approach for soil as the one used for ecosystem valuation will require the definition of “willingness-to-pay” for soil services or functions. Such an approach will face conceptual, theoretical and practical challenges in seeking to identify monetary value at local and global scales, and sentimentalist criticism.

The outcome of the LCN reflection will be developed and its finding summarised in a latter publication.

### **Publications**

#### *Think pieces*

- Hopkins D.W. 2003. Soil Biodiversity and Nature Conservation. In: Current issues in Soils and Nature Conservation: Review Papers (ed. P. M. C. Bruneau). *Scottish Natural Heritage Commissioned report*
- Hornung M. 2003. Soil and Ecosystem Function. In: Current issues in Soils and Nature Conservation: Review Papers (ed. P. M. C. Bruneau). *Scottish Natural Heritage Commissioned report*
- Davidson D.A. 2003. Soil Indicators. In: Current issues in Soils and Nature Conservation: Review Papers (ed. P. M. C. Bruneau). *Scottish Natural Heritage Commissioned report*

#### *The distribution of semi-natural soils*

- Gauld J.H., Bell J.S. and Bruneau P.M.C. 2003. Soil and Nature Conservation. Natural Heritage Zone characteristics. *Scottish Natural Heritage Commissioned report, FC00AC101*

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## Other news

### **SNIFFER Update on Soil Projects**

The Scotland and Northern Ireland Forum for Environmental Research (**SNIFFER**, <http://www.sniffer.org.uk/>) is an organisation managing research on behalf of members who include Scottish Executive, SNH, SEPA, Forestry Commission and EHS Northern Ireland. It is developing a programme of soils-related research, some of which has a UK-wide remit through its collaboration with the EA.

### **SNIFFER Land Quality Theme**

Following an initial stakeholder workshop, the Land Quality Theme was officially introduced in February 2002. It aims to contribute, through research, to the sustainable use and management of land and soil in Scotland and Northern Ireland. Land quality is a very broad term. Following a consultation with SNIFFER members and other stakeholders, it was decided that the Theme would focus on seven priority issues including soil quality, land stewardship and climate change. Over the next few months, SNIFFER will concentrate on the following:

- The creation of an on-line database on land quality research (LQReD) focusing on the seven priority issues already identified.
- Communicating existing research to end-users (e.g. policy makers and implementers), notably through the production of 'Topic Overviews'
- Facilitating dialogue between end-users and researchers
- Identifying and addressing research gaps

A stakeholder workshop will take place at the end of August to identify specific research needs and agree future research projects. Further details on this event will be issued in due course.

For further information contact: Marie-Amélie Viatte, Land Quality Research Manager (Tel: 0131 524 9744 Email: [marie-amelie@sniffer.org.uk](mailto:marie-amelie@sniffer.org.uk)).

### **Other SNIFFER research programmes**

*UKLQ01; The role of the UK planning system in protecting and enhancing soil quality*

*Land Use Consultants* were commissioned in 2002 to examine the current and potential role of the planning system in protecting and enhancing soils. The study comprises three main components. The first is an analysis of the current role of the planning system in conserving and enhancing soils. The second is an examination of how this role could be improved in the medium and longer term. The third is the preparation of guidance to assist those involved in the planning process to consider soil issues more fully. The study is programmed for completion in the autumn of 2003.

A research summary was published in Sustainable Scotland Network Newsletter to coincide with the launch of a questionnaire sent to selected UK planning authorities.

For further information contact: Fiona Mactaggart ([fiona@sniffer.org.uk](mailto:fiona@sniffer.org.uk))

### **OECD Expert Meeting on Soil Erosion and Soil Biodiversity Indicators, Rome, 25-28 March, 2003**

This meeting was organised by OECD, as part of a programme of expert meetings to develop a set of agri-environmental indicators. These are being developed to help establish state and trends of environmental conditions in land used for agriculture and as a tool to assist policy monitoring, policy evaluation and projections of future policy scenarios. John Gordon represented the Soils Lead Co-ordination Network at this meeting and presented a paper prepared by members of the network and its technical advisors at CEH on 'Soil Biodiversity Indicators for Agricultural Land: Nature Conservation Perspectives'.

The aims of the meeting were to:

- review the current set of OECD soil erosion indicators based on recent research;

- consider a methodological framework for identifying soil biodiversity indicators;
- make recommendations to the OECD Joint Working Party on Agriculture and Environment for indicators to help address policy concerns related to soil;
- provide input to the next OECD report on *Environmental Indicators for Agriculture* (mid-2004) and national efforts on soil quality monitoring.

The main recommendations from the meeting included:

- A comprehensive approach should be taken in addressing soil quality and its environmental impacts, recognising the multifunctionality of soils on agricultural land and their value for ecological and environmental services, as well as for crop production.
- The current set of OECD Soil Quality Indicators should be enhanced and an additional indicator for tillage erosion should be added.
- Systematic monitoring should be carried out to support efforts to develop and implement soil erosion indicators.
- OECD to develop an inventory of frameworks, methodologies and indicators relevant to national policy objectives for which soil biodiversity indicators are being developed.
- Develop criteria and guidelines at different spatial scales as a framework for guiding selection of soil biodiversity indicators, including the assessment of soil biodiversity resilience.
- OECD to report national case studies based on available approaches to provide confidence in evaluating potential indicators at regional scales (i.e. linking to soil erosion, best management practices, increased soil organic content and above-ground processes in terms of habitats and species affected by changes in land use).

The papers presented at the meeting will be revised and made available on the OECD web site in late June 2003. A synthesis of the outcomes will be included in the next OECD report on *Environmental Indicators for Agriculture* due in 2004.

For further information, contact John Gordon at Scottish Natural Heritage ([john.gordon@snh.gov.uk](mailto:john.gordon@snh.gov.uk))

**British Ecological Society (BES) and NERC soil Biodiversity Meeting 25-28 March 2003**

The 2003 Annual Symposium of the British Ecological Society (BES), "Soil Biodiversity and Function" held at Lancaster University, brought together 240 participants from 21 countries. Talks were by invitation only but an overwhelming number of posters were submitted by delegates (114 in total). The proceedings of this symposium will be published before end of 2003. Further information on the meeting and proceedings can be found at <http://www.britishecologicalsociety.org/articles/meetings/>.

The goals of the meeting were to review and update the understanding of: patterns of soil biodiversity and methods for its assessment; the function of soil biodiversity in relation to land use and ecosystem processes, the regulation of soil biodiversity in relation to environmental and land use change, and the application of new concepts in soil biodiversity.

Some of the key outputs and findings from the meeting presentation and discussions are as follows;

- Origin of the biodiversity results from **spatial organisation** (soil architecture), **substrate diversity** and **competition**.
- Drivers of communities structure are **resources**, **living space**, and **environmental factors** (abiotic, biotic and interactions with autotrophs).
- Soil Biodiversity goes beyond diversity. It is beguiling and difficult to measure. The challenge of quantifying and describing soil biodiversity can be achieved using new biotechnology resources.
- Experimental approaches to assess biodiversity function can be **constructive** (add new species to a system), **destructive** (adding stress and reducing diversity), and use **natural gradients** (e.g. colonisation on sand dune) or **models** (food web or function).
- Species richness bears little relation to function and the case for redundancy of function is not proven. Soil organisms are functionally redundant and high diversity of soil habitats might

be what really matter, rather than species diversity.

The BES meeting was followed by the one-day annual NERC soil biodiversity meeting.

The NERC Soil Biodiversity Programme aims to achieve simultaneously an understanding of biological diversity of the soil biota (embracing all abundant taxa, not just those normally considered tractable), and the functional roles played by soil organisms in key ecological processes. It is closely integrated, to give insights of wider generality than the chosen ecosystem, an upland grassland at Sourhope, near Kelso, Scotland. Details of the programme can be found at <http://www.nmw.ac.uk/soilbio/>, including the programme [Newsletter bumper issue no 9](#) that summarised the results of phase I of the programme completed in May 2002.

The rationale behind phase II of the programme was to build on the acquired knowledge collected during the characterisation and investigation of relationship between soil biodiversity communities in phase I, using technical development in <sup>13</sup>C pulse labelling to;

- focus on multi-level trophic interactions in soil;
- investigate the resilience of soil organisms performing key transformations;
- develop a model of soil biota interaction.

The programme will also provide valuable outputs fro end-users to help assess the impact of management practices on land resources and demonstrate the need for science to provide accurate answers on ecological impacts, especially in relation to new developments in soil protection policy, both at EU and UK levels.

### **LCN Meeting**

The Lead Agency / Coodinator networks meeting on 4 February 2003 in Peterborough review the current situation, planning and reporting process of the networks and explored ways in which communications between the networks and Chief Scientist Group could be improved.

- The air pollution LCN will run a workshop on air pollution and links to site assessment this autumn. The workshop will review site-specific evidence of air pollution impacts in relation to the climate change and history and agree conservation agency responsibility in monitoring impacts on statutory sites and how to report risk or impacts on sites. (See section on forthcoming meetings for detail)
- Vicky Morgan (Lowland Grassland LCN) has agreed to undertake a review of long-term ecological studies in the UK, covering the priority habitats covered by LCNs, but focusing on lowland grassland and heathland. (for further information contact [vicky.morgan@english-nature.org.uk](mailto:vicky.morgan@english-nature.org.uk))
- The JNCC web site refit was discussed. It provides further opportunities to publicise work of the networks.

### **Pontbren: Effect of tree planting on agricultural soils and their functions**

In November 2002, CCW, WAG, Forestry Commission Wales (FCW), Coed Cymru and NERC Centre for Ecology and Hydrology set up a project to investigate the impacts of strategic tree plantation on the condition and function of farmland soils.

The fieldwork was carried out at the Pontbren group of farms situated near Llanfair Caereinion in the uplands of Montgomeryshire. Pontbren is a farmer-led initiative involving 10 contiguous hill farms and over 1000 ha of farmland used primarily for sheep and cattle grazing, covering the catchment of an upper tributary of the River Severn. The aims of Pontbren include providing a more sustainable approach to farming, diversifying farming approaches, and increasing economic returns. The Pontbren farmers have anecdotal evidence that suggests their tree plantations improve soil structure, reduce water runoff during heavy rainfall and provide excellent habitat for wildlife. However, there is a need for these effects to be quantified, and for the underlying processes to be understood, so that the findings can be transferred to other situations.

The preliminary results reported in February 2003 showed some striking effects on soils, including, lower soil compaction and higher water infiltration rates in the tree plantations compared to the open grazed pastures (Bird et al., 2003 CCW, Contract Science Report No 550.).

Further, more detailed, work is proposed for this coming year.

For further details contact: Dylan Williams, [dl.williams@ccw.gov.uk](mailto:dl.williams@ccw.gov.uk)

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## Forthcoming meetings

### **Upland Lead Co-ordination Network**

Managing upland catchments: priorities for water and habitat conservation

July 10th/11th 2003

University of Durham

Sally Johnson: [Sally.johnson@snh.gov.uk](mailto:Sally.johnson@snh.gov.uk)

### **SNIFFER: stakeholder workshop**

August 2003

Identification of specific research needs and future research projects.

Marie-Amélie Viatte; Tel: 0131 524 9744

[marie-amelie@sniffer.org.uk](mailto:marie-amelie@sniffer.org.uk)

### **British Society of Soil Science autumn conference**

To be held early Sept 2003, Aberdeen

**Remediation of contaminated soils and sites.**

Prof. Ken Kilham; [k.kilham@abdn.ac.uk](mailto:k.kilham@abdn.ac.uk)

Dr Jim Gauld; [j.gauld@macaulay.ac.uk](mailto:j.gauld@macaulay.ac.uk)

### **Lead Co-ordination Networks workshop.**

28/29 October Bangor

Simon Bareham; [s.bareham@ccw.gov.uk](mailto:s.bareham@ccw.gov.uk)

Clare Whitfield; [clare.whitfield@jncc.gov.uk](mailto:clare.whitfield@jncc.gov.uk)

### **Scottish Natural Heritage conference**

4- 7 November 2003. Pitlochry

Farming, forestry and the natural heritage

For further information contact:

[Helen.forster@snh.gov.uk](mailto:Helen.forster@snh.gov.uk)

### **Soils Lead Co-ordination Network annual meeting.**

Tuesday 16 December 2003, Reading.

Inter-agency Soil conservation seminar.

Tony Weighell; [Tony.weighell@jncc.gov.uk](mailto:Tony.weighell@jncc.gov.uk)

### **EUROSOIL 2004,**

6-12 Sept 2004.

Freiburg, Germany

For more information consult:

<http://www.forst.uni-freiburg.de/eurosoil/>

### **Scottish Soils Discussion group.**

Great Scottish Discoveries in Soil Science.

Date to be arranged

Paul Hallett: [p.hallett@scri.sari.ac.uk](mailto:p.hallett@scri.sari.ac.uk)

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## Contact points for soils across the country agencies

### **JOINT NATURE CONSERVATION COMMITTEE**

<http://www.jncc.gov.uk/>

#### **Tony Weighell**

Email: [tony.weighell@jncc.gov.uk](mailto:tony.weighell@jncc.gov.uk)

Tel: 01733 866 902

### **SCOTTISH NATURAL HERITAGE**

<http://www.snh.org.uk/>

#### **Patricia Bruneau**

Email: [patricia.bruneau@snh.gov.uk](mailto:patricia.bruneau@snh.gov.uk)

Tel: 0131 446 2400

#### **John Gordon**

Email: [john.gordon@snh.gov.uk](mailto:john.gordon@snh.gov.uk)

Tel: 0131 446 2400

### **CYNGOR CEFN GWLAD CYMRU / COUNTRYSIDE COUNCIL FOR WALES**

<http://www.ccw.gov.uk/>

#### **Dylan Williams**

Email: [dl.williams@ccw.gov.uk](mailto:dl.williams@ccw.gov.uk)

Tel: 01248 38 5487

### **ENGLISH NATURE**

<http://www.english-nature.org.uk/>

#### **John Hopkins**

Email: [john.hopkins@english-nature.org.uk](mailto:john.hopkins@english-nature.org.uk)

Tel: 01733 455 000

### **ENVIRONMENT AND HERITAGE SERVICES**

<http://www.ehsni.gov.uk/>

#### **Ian Enlander**

Email: [ian.enlander@doeni.gov.uk](mailto:ian.enlander@doeni.gov.uk)

Tel: 028 90546610

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