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## **JOINT NATURE CONSERVATION COMMITTEE**

### **THE WORK OF THE BIOLOGICAL RECORDS CENTRE**

**Paper by Dr Ian McLean and Professor Mark Hill**

#### **1. Introduction**

- 1.1 The Biological Records Centre (BRC) was established in 1964 under the direction of Franklyn Perring, based at Monks Wood within the former Nature Conservancy. At the formation of The Nature Conservancy Council (NCC) and the Institute of Terrestrial Ecology (ITE) BRC remained at ITE Monks Wood and was funded jointly by NCC and ITE. When the current statutory conservation agencies were established in 1990, BRC became jointly funded by JNCC and ITE, and then by JNCC and the Centre for Ecology and Hydrology (CEH) established in 1999 within the Natural Environment Research Council (NERC). In 2003 the previous Head of BRC, Paul Harding, retired and was succeeded by Professor Mark Hill.
- 1.2 The BRC is the national focus in the UK for biological recording of species other than birds. BRC works with the voluntary recording community throughout Britain and Ireland via specialist societies and over 50 national recording schemes, who together coordinate the efforts of several thousand naturalists. Currently the BRC database contains about 15 million records of over 9,000 species, with checklists for an additional 3,000 species. It is the most extensive and detailed database on the distribution and status of species for anywhere in the world.
- 1.3 In recent years, BRC has been a vital part of developing the National Biodiversity Network (NBN) to make biodiversity data and information more readily available and useful throughout the UK (see Section 5, below). BRC is also a data centre within NERC being a custodian of multiple datasets, ranging from plant quadrats to butterfly transect counts.

#### **2. Background to the current contract**

- 2.1 The current six year contract began in 1999 with enhanced funding from JNCC and CEH and the aim of redeveloping the role of BRC in support of the NBN and to fulfil the requirements of both the statutory conservation agencies and NERC institutes for acquiring, managing and utilising biodiversity data. The funding available has been £150,000 per annum from JNCC matched by £150,000 per annum from CEH/NERC, with additional funding from JNCC

for work on the NBN Gateway and additional funding from NERC to boost the research use of the information.

- 2.2 The increased level of activity resulting from the raised level of funding in the current contract has enabled some of the problems from previous under-investment in BRC to be addressed and overcome. These included the lack of easy access to BRC data, backlogs of data not available electronically and insufficient understanding of the BRC role.
- 2.3 Over the current contract increased collaborative and joint working between BRC and JNCC staff has been successful from the perspective of both organisations. The current contract has delivered an improved BRC, where the fundamentals of responsiveness to external needs and the means of effective delivery are well established.

### 3. Structure of BRC work programmes

- 3.1 The work of BRC is organised under **two main themes** concerned with people and with data. Within these two themes individual projects deliver particular targets, such as the publication of an atlas in collaboration with a recording scheme, or giving technical support for developing the NBN Gateway.
- 3.2 Theme one **Recording schemes and atlas production**; BRC works closely with volunteer recorders through specialist societies such as *Butterfly Conservation* and the *Botanical Society of the British Isles*, which involves liaison and communication roles and a detailed understanding of naturalists and of the ways of recording different groups of species effectively. BRC adds scientific analysis skills, as well as major drafting and editing contributions, after datasets have been compiled and the derived information is brought into a form where the distribution patterns, habitat associations and temporal changes are revealed.
- 3.3 Theme two **Data input, management and dissemination**; BRC acquires, manages and analyses much data and makes the results available through published atlases, by supply of electronic data to individual enquirers, and via the NBN Gateway. The use of Internet technology has revolutionised access to BRC data, so that species records can be viewed flexibly at different spatial scales and related to geographical features and statutory site boundaries. These two main themes of working with volunteers and managing data will remain paramount, although the nature of the work will continue to change as new technology becomes available and as BRC datasets are increasingly analysed in conjunction with other environmental data.

### 4. Management and staffing of current BRC partnership programme

- 4.1 The Nominated Officers are Prof. Mark Hill for CEH and Dr Ian McLean for JNCC. They are advised by the BRC Management Advisory Group (BRCMAG), which meets twice a year and has representatives from

stakeholders and customers of BRC (see Annex 5 for the current membership of BRCMAG). BRCMAG has proved a successful group for improving the links between BRC and its customers and stakeholders. It has also facilitated good links with the work of the NBN, serving for a time as a steering committee for the NBN Development Officer, Trevor James, who is based at BRC and funded by the Heritage Lottery Fund with facilities provided by CEH.

- 4.2 It is proposed to continue the present management arrangements, with the CEH and JNCC Nominated Officers responsible for the planning and delivery of agreed work programmes under the guidance of BRCMAG. Other BRC contracts with the NBN or other organisations (such as Defra and the Environment Agency), will report to their existing Nominated Officers or Committees.
- 4.3 The staff who contribute work to BRC partnership programme are listed in Annex 2. These staff are employed principally on BRC duties, although a variable proportion of their time is spent on other projects. While the development work supported by the NBN Trust is not part of the JNCC/CEH funded partnership programme, its close relationship to BRC partnership work results in joint planning and management of the work.

## **5. BRC and the National Biodiversity Network**

- 5.1 The NBN is a partnership between JNCC, NERC, RSPB, The Wildlife Trusts, The Natural History Museum and the Environment Agency. Because of its central role in coordinating biological recording in the UK, BRC has a vital part to play in bringing together data and other contributions from many different bodies. The special roles of BRC in relation to the NBN have been to support the development of national societies and recording schemes, to publish atlases and other publications that summarise much data and derived analyses in a user-friendly form, and to make large biodiversity datasets available via the Internet.
- 5.2 In order to sustain the enthusiasm and contributions of the many thousands of volunteer recorders, BRC seeks to maintain close working links with the national societies and recording schemes. It is essential to maintain continuity of relations and a consistent approach with volunteers at a time when there are more and more requests for their time and expertise. The extensive recording coverage achieved by the major projects referred to in 6.1 (below) is only possible because individual recorders spend up to several hundred hours in the field each year in recording the presence and abundance of plants and animals.
- 5.3 In recent years the Annual Conference for National Societies and Recording Schemes organised in November by BRC and NBN has given a welcome focal point for biological recording. It has also provided the opportunity for naturalists from many disciplines to come together and share knowledge and best practice, as well as to learn about new developments and initiatives.

## **6. Outputs from the current Partnership 1999 to 2004**

- 6.1 Major achievements from the current six year contract include the publication of *The Millennium Atlas of Butterflies in Britain and Ireland* and the *New Atlas of the British and Irish Flora* as well as provisional atlases and other publications including BRC data. The major atlas publications have been recognised for their comprehensive coverage and thorough analyses of the distribution of animals and plants. The extensions for some butterfly distribution ranges resulting from climate change, and the declines of many species resulting from habitat loss and change, were two major findings of conservation significance from the *Millennium Atlas*. For plants, the declines for species with low nutrient requirements in contrast to the increases for species with high nutrient requirements (resulting from high use of fertilisers and increased deposition of atmospheric nitrogen) and the dramatic spread of many invasive non-native species are just two examples out of many findings of conservation importance in the *New Atlas*. A list of publications derived from the BRC work programme is given at Annex 3.
- 6.2 The growth of the Internet as a means of sharing and making available biodiversity data and information has been a driver for the NBN in developing the NBN Gateway as a means of accessing large numbers of biological records. Many of the datasets currently available via the NBN Gateway (see Annex 4 and via the NBN Gateway at: [www.searchnbn.net](http://www.searchnbn.net)) have been provided by BRC from the work of specialist societies and national recording schemes. These datasets are now accessible “at the desk” to staff in the statutory conservation agencies, providing a fast and flexible tool to view detailed species data overlain upon detailed Ordnance Survey maps at different spatial scales (ranging from national or regional distributions down to individual sites).

## **7. Main themes proposed for new MoU between JNCC and CEH for BRC work**

- 7.1 The strategic direction of BRC for the next six years will aim to meet the needs of the statutory conservation agencies for conservation purposes and of CEH within NERC for environmental science, for accurate data on the changing distribution and status of plants and animals.
- 7.2 The BRC will remain crucial for working effectively with the many national recording schemes and specialist societies, who together coordinate the efforts of thousands of volunteer naturalists recording wildlife throughout Britain. The largest schemes and societies are becoming increasingly self-sufficient in day-to-day management of their data. For these, BRC serves as a national archive of historic datasets. Even for some of the smaller schemes, the data entry facilities offered by BRC are becoming less necessary, with more data transfer to BRC being via electronic media.

- 7.3 JNCC and CEH are committed to strengthening the NBN as a means of making biodiversity data and information more widely available and useful to those making decisions that affect the environment, and BRC will remain the essential focal point for developing NBN.
- 7.4 CEH and JNCC wish to increase the value of data derived from BRC schemes by developing the analysis and use of these data in conjunction with other environmental datasets. Aspects of particular interest include range and phenology changes in relation to climate change, the response of species to land use and other major changes in the countryside, and developing novel ways of analysing BRC data to reveal changes in the relative abundance of species over time. BRC data will become more strongly linked to the Countryside Survey, which is supported by NERC, Defra and the statutory conservation agencies.
- 7.5 It is proposed that the programme of work for the next six year contract should include the following aspects:
- i. **maintaining** effective working links with specialist societies and national recording schemes and excellent relationships with volunteers;
  - ii. **continuing** the process of supporting the development of specialist societies and national recording schemes, in conjunction with the NBN, to increase the resources available to these bodies, their ability to recruit and organise volunteers and to increase the satisfaction of those participating in biological recording activities;
  - iii. **establishing** some wider participation surveys of emblematic species to raise the profile of BRC, of NBN and of biological recording in general;
  - iv. **extending** the scope of BRC data holdings to include other types of data, such as species attribute data and data from quadrats and other samples that will assist with analysis and interpretation of results from BRC schemes;
  - v. **improving** data management to allow faster and better feedback to recorders and more rapid and complex analyses;
  - vi. **increasing** the analytical role of BRC staff with respect to interpreting the results from BRC schemes in order to improve the uses of the data for reporting on the state of UK biodiversity and for understanding the effects of environmental changes upon species.

## 8. Next steps for the negotiation process

- 8.1 The April 2004 meeting of BRCMAG will be invited to consider the direction of the work of BRC for the next six years in order to obtain their comments on the balance of effort and top priorities for the medium term. Their responses

will be used by both CEH and JNCC in preparing the BRC draft programme and draft contract documents.

- 8.2 After the BRCMAG meeting in April 2004, the BRC draft programme and draft contract documents will be circulated to appropriate staff in the Country Agencies for their views and comments. This will be the main opportunity for specialist, policy and operational staff to give feedback on current outputs from BRC and to specify their future requirements.
- 8.3 In November 2004 CEH's First Quinquennial Programme will be considered by NERC's Science and Innovation Strategy Board (SISB). The Programme is structured in 17 themes, of which Theme 9 'Biodiversity characterization, monitoring and assessment: delivering the basis for conserving and exploiting biodiversity and ecosystems' includes the work of BRC as a major component. The continued operation of BRC in CEH is dependent on SISB's approval. In the opinion of the Nominated Officers, the prospects are highly favourable, as CEH and NERC want to see enhancements in data management and dissemination.
- 8.4 The revised BRC programme will be costed and prepared for approval during summer 2004. The September 2004 meeting of the Joint Committee will be invited to approve the contract and joint programme for the next six year period. At this meeting more detailed plans and programme costs will be included for approval.
- 8.5 The Joint Committee is invited to:
  - i. **note** the work of the BRC over the course of the previous contract, its achievements and direction;
  - ii. **comment** upon the proposed future direction over the period 2005 to 2011;
  - iii. **approve** the next steps of the negotiation process.

## **Annex 1**

### **Objectives of the JNCC partnership with CEH for the work of BRC**

The primary objectives of the BRC Partnership are:

- 1 for BRC to lead and co-ordinate biological recording of plants and animals in the UK;
- 2 to meet the needs of the statutory conservation agencies for data, information and advice for conservation purposes on the distribution and status of groups of plants and animals covered by BRC schemes;
- 3 to meet the needs of environmental researchers, especially those in UK research centres and universities, for accurate and up to date data for scientific purposes on the distribution and status of groups of plants and animals covered by BRC schemes;
- 4 to further the joint objectives of CEH and JNCC for developing the NBN;
- 5 to maximise the shared priorities between JNCC and CEH to increase the benefits from their joint investment in BRC;
- 6 to seek wider support for the work of BRC from other sources of funding and, if possible, to increase the number of funding partners contributing to the core funding of BRC work.

## Annex 2

**BRC staff and their roles.** All staff carry out some additional work outside of the BRC partnership programme. The three staff who are currently funded entirely from other sources work closely with the ten staff who receive core funding, so that the unit is in practice highly integrated.

### 1. Mainly or partly funded by JNCC-CEH core funding, including additions for NBN Gateway project

Head of BRC:	Prof. Mark Hill
Data Analysis:	David Roy
Information Scientist (spatial data):	Jon Cooper
Information Scientist (Web databases):	Richard Ostler
Data Manager:	Henry Arnold
Botanical schemes:	Dr Chris Preston
Zoological schemes:	Dr Gavin Broad
Butterfly Monitoring & Lepidoptera:	Nick Greatorex-Davies
Web development:	Francis Rowland
Data Processor:	Val Burton

### 2. Funded from sources outwith JNCC-CEH core contract

BRC Administrative Support:	(vacant)
NBN Officer National Schemes & Societies:	Trevor James (funded by the NBN Trust)
Environmental Data Scientist:	Cassie Hoyland (funded only by CEH)

## Annex 3

### Bibliography for Biological Records Centre 1999-2003

The following list includes all atlases and provisional atlases published by the Biological Records Centre over the reporting period. Other publications are listed more selectively, but the list gives a flavour of what has been produced. Numerous other publications such as the autecological accounts in the *Biological Flora of the British Isles* use BRC data. No attempt has been made to include these here.

#### MAIN ATLASES

- Asher, J., Warren, M., Fox, R., Harding, P., Jeffcoate, G. & Jeffcoate, S. 2001.** *The Millennium Atlas of Butterflies in Britain and Ireland*. Oxford: Oxford University Press.
- Kerney, M. P. 1999.** *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. Colchester: Harley Books.
- Preston, C.D., Pearman, D.A. & Dines, T.D.(eds) 2002.** *New Atlas of the British and Irish Flora*. Oxford: Oxford University Press.

#### PROVISIONAL ATLASES

- Alexander, K.N.A. 2003.** *Provisional atlas of the Cantharoidea and Buprestoidea (Coleoptera) of Britain and Ireland*. Huntingdon: Biological Records Centre.
- Ball, S.G. & Morris, R.K.A. 2000.** *Provisional atlas of British hoverflies (Diptera, Syrphidae)*. Huntingdon: Biological Records Centre.
- Edwards, R. & Telfer, M.G. (eds) 2001.** *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland*, Part 3. Bees, Wasps and Ants Recording Society. Huntingdon: Biological Records Centre.
- Edwards, R. & Telfer, M.G. (eds) 2002.** *Provisional atlas of the aculeate Hymenoptera of Britain and Ireland*, Part 4. Bees, Wasps and Ants Recording Society. Huntingdon: Biological Records Centre.
- Harvey, P.R., Nellist, D.R. & Telfer, M.G. (eds) 2002.** *Provisional atlas of British spiders (Arachnida, Araneae)* 2 vols. Huntingdon: Biological Records Centre.
- Huxley, T. 2003.** *Provisional atlas of the British aquatic bugs (Hemiptera, Heteroptera)*. Huntingdon: Biological Records Centre.

#### STARTER PACKS

- Stubbs, A. 2003.** *Dipterists Forum - Starter Pack*. Huntingdon: Biological Records Centre.

#### RED DATA BOOKS WITH SUBSTANTIAL BRC INPUT

- Church, J.M., Hodgetts, N.G., Preston, C.D. & Stewart, N.F. (comps & eds) 2001.** *British Red Data Books: mosses and liverworts*. Peterborough: Joint Nature Conservation Committee.
- Wigginton, M.J. (ed.) 1999.** *British Red Data Books: 1 Vascular plants* (3rd edition). Peterborough: Joint Nature Conservation Committee.

#### BOOKS OTHER THAN BRC ATLASES

- Hill, M.O. & Edwards, B. 2003.** *Mosses and liverworts of Dorset*. Dorchester: Dorset Environmental Records Centre.
- Hill, M.O., Mountford, J.O., Roy, D.B. & Bunce, R.G.H. 1999.** *Ellenberg's indicator values for British plants*. ECOFACT Volume 2 Technical Annex. Huntingdon: ITE.
- Pearman, D.A. & Preston, C.D. 2000.** *A Flora of Tieve, Gunna and Coll*. Dorchester.
- Preston, C.D., Telfer, M.G., Arnold, H.R., Carey, P.D., Cooper, J.M., Dines, T.D., Hill, M.O., Pearman, D.A., Roy, D.B. & Smart, S.M. 2002.** *The changing flora of the UK*. London: DEFRA.

#### PAPERS IN THE OPEN LITERATURE (selected)

- Griffiths, G.H., Eversham, B.C., & Roy, D.B. 1999.** Integrating species and habitat data for nature conservation in Great Britain: data sources and methods. *Global Ecology and Biogeography*, **8**, 329-345.
- Hill, M.O. 2003.** Using data from local floras for ecological research. *Watsonia*, **24**, 321-329.

- Hill, M.O. & Preston, C.D. 2002.** *New Atlas* genera in their natural orders. *BSBI News*, **91**, 18-23.
- Hill, M.O., Roy, D.B. & Thompson, K. 2002.** Hemeroby, urbanity and ruderality: bioindicators of disturbance and human impact. *Journal of Applied Ecology*, **39**, 708-720.
- King, R.A., Gornall, R.J., Preston, C.D. & Croft, J.M. 2002.** Population differentiation of *Potamogeton pectinatus* in the Baltic Sea with reference to waterfowl dispersal. *Molecular Ecology* **11**: 1947-1956.
- Preston, C.D. 2000.** Engulfed by suburbia or destroyed by the plough: the ecology of extinction in Middlesex and Cambridgeshire. *Watsonia* **23**, 59-81.
- Preston, C.D. 2002.** 'Babingtonia pestifera' – the explosive spread of *Elodea canadensis* and its intellectual ramifications. *Nature in Cambridgeshire*, no. **44**: 40-49.
- Preston, C.D. 2003.** Perceptions of change in English county floras, 1660-1960. *Watsonia* **24**: 287-304.
- Preston, C. D. & Hill, M. O. 1999.** The geographical relationships of the British and Irish flora: a comparison of pteridophytes, flowering plants, liverworts and mosses. *Journal of Biogeography* **26**, 629-642.
- Preston, C.D., Stewart, N.F. & Palmer, M.A. 2000.** The standing waters of Coll and Tiree in a national and international context. *Botanical Journal of Scotland* **52**, 43-64.
- Preston, C.D. & Walker, K.J. 2003.** Creeping inflation in the length of English county floras, 1730-1960. *Watsonia* **24**: 447-449.
- Palmer, M.A. & Roy, D.B. 2001.** A method for estimating the extent of standing fresh waters of different trophic status in Great Britain. *Aquatic Conservation: Marine and Freshwater Ecosystems*, **11**, 199-216.
- Proudlove, G.S., Wood, P.J., Harding, P.T., Horne, D.J., Gledhill, T. & Knight, L.R.F.D., 2003.** A review of the status and distribution of the subterranean aquatic Crustacea of Britain and Ireland. *Cave and Karst Science*, **30**, 9-22.
- Roy, D.B., Hill, M.O., Rothery, P. 1999.** Effects of urban land cover on the local species pool in Britain. *Ecography*, **21**, 507-515.
- Shreeve, T., Dennis, R.L.H., Roy, D.B., & Moss, D. 2001.** An ecological classification of British butterflies: ecological attributes and biotope occupancy. *Journal of Insect Conservation*, **5**, 145-161.
- Telfer, M.G., Preston, C.D. & Rothery, P. 2002.** A general method for measuring relative changes in range size from biological atlas data. *Biological conservation* **107**, 99-109.
- Warren, M. S., Hill, J. K., Thomas, J. A., Asher, J., Fox, R., Huntley, B., Roy, D. B., Telfer, M. G., Jeffcoate, S., Harding, P., Jeffcoate, G., Willis, S. G., Greatorex-Davies, J. N., Moss, D. & Thomas, C. D. 2001.** Rapid responses of British butterflies to opposing forces of climate and habitat change. *Nature*, **414**, 65-69.

#### REPORTS TO COUNTRY AGENCIES AND JNCC

- Hill, M.O., Davies, C.E., Harris, M.P., Marquiss, M., Harding, P.T., Preston, C.D., Roy, D.B., Telfer, M.G., & Welch, D. 2002.** Biodiversity assessment: the state of and changes in Scotland's biodiversity. *Scottish Natural Heritage Research, Survey and Monitoring Report* **185**, 1-210.
- Hill, M.O., Downing, T.E., Berry, P.M., Coppins, B.J., Hammond, P.S., Marquiss, M., Roy, D.B., Telfer, M.G., & Welch, D. 1999.** Climate changes and Scotland's natural heritage: an environmental audit. *Scottish Natural Heritage Research, Survey and Monitoring Report* No. 132. Battleby: SNH.
- Mountford, J.O., Cooper, J.M., Roy, D.B., & Warman, E.A. 1999.** Targeting areas for the restoration and re-creation of coastal and floodplain grazing marsh, Rep. No. 332. Peterborough: English Nature.
- Palmer, M.A. & Roy, D.B. 2001.** An estimate of the extent of dystrophic, oligotrophic, mesotrophic and eutrophic standing fresh water in Great Britain. Peterborough: JNCC.
- Welch, D., Carss, D.N., Gornall, J., Manchester, S.J., Marquiss, M., Preston, C.D., Telfer, M.G., Arnold, H. & Holbrook, J. 2001.** *An audit of alien species in Scotland.* Scottish Natural Heritage Review no. 139. Edinburgh and Battleby: Scottish Natural Heritage.

#### CONFERENCE REPORTS

- Harding, P.T., 2003.** The National Biodiversity Network in the UK. In: *Changes in ranges: invertebrates on the move.* Proceedings of the 13<sup>th</sup> International Colloquium of the European Invertebrate Survey, Leiden, 2-5 September 2001, edited by M.Reemer, P.J.van Helsdingen & R.M.J.C.Kleukers, 111-114. Leiden: EIS Nederland.

## **Annex 4**

### BRC datasets currently loaded on the NBN Gateway

It is planned that most datasets held by BRC will be available on the NBN Gateway by the time of the launch in May 2004. An automatic data loader for transferring data from BRC to the Gateway is ready; it will be tested on 4 March. Assuming that the data loader works successfully, the only BRC datasets that will not be transferred to the Gateway are those where there are doubts about data quality (notably macro-moths) and those which are embargoed pending the publication of an atlas (notably fishes and Chrysomelid beetles).

#### ***(a) Data on Gateway on 4 March 2004***

Bryophytes  
Butterflies (10-km square summary data)  
Dragonflies  
Freshwater Crayfish  
Ground beetles  
Spiders  
Vascular plants

#### ***(b) Other datasets, which will be on the Gateway for the public launch in May 2004.***

Aculeate Hymenoptera (10-km square summary data)  
Orthoptera  
Reptiles and amphibians  
Terrestrial and freshwater molluscs (10-km square summary data)  
Mammals

## **Annex 5**

### Membership of the BRC Management Advisory Group as of March 2004

Chairman:	Sir John Burnett
Head of BRC	Prof. Mark Hill
For JNCC	Dr Ian McLean
For NBN Trust	Dr Jim Munford
For NBN NSS work	Trevor James
For Recording Schemes	Dr Michael Archer
For NGOs	Nicola Hutchinson (Plantlife)
For Departments	Debbie Boobyer (Defra)
For LRCs	Nicky Court (Hampshire BRC)
For Country Agencies	Ray Woods (CCW)
For Universities	Dr Mark Young (Aberdeen University)
For NERC	Dr Michael Morecroft (CEH Lancaster)