

The national biodiversity network in the UK

Paul Harding

Abstract

The National Biodiversity Network (NBN) has been developed in the United Kingdom over a period of about five years, forming the NBN Trust in March 2000. The NBN Trust brings together those with shared interests in the collection, management and use of data and information about species, biotopes and sites in the UK. These include volunteers and specialist societies, non-governmental wildlife organisations and the statutory nature conservation agencies and other governmental organisations. By working to common standards, agreeing priorities and sharing data, greater use can be made of the work of the specialists and skilled volunteers that collect biodiversity data in the field. NBN is still developing, but it is beginning to create new opportunities in surveying and monitoring species, managing data and particularly in disseminating data. Central to the development of NBN is a system for providing access to remotely held data sets using internet technology – the NBN Gateway. From a European perspective the most important aspects of the NBN are freedom of access to biodiversity data via the internet Gateway and agreed standards for data and their management and dissemination.

Key words: National Biodiversity Network, biodiversity, internet, data, information, standards.

Why we need the national biodiversity network (NBN) in the UK

Data and information about species, biotopes and sites are essential for informed decisions to be made affecting the natural environment and for wise use to be made of resources. To measure changes, in the range or abundance of species or biotopes, at least time-series observations and preferably a system for structured, repeated surveys (surveillance) are required. Although the UK has a long tradition of collecting data about the occurrence of species and, to a lesser extent, biotopes, the data have been widely dispersed and usually inaccessible except to the 'owner' of the data. Modern information technology enables greater sharing of data and information and offers a mechanism to provide access to dispersed and hitherto inaccessible data. But for sharing to be possible, those who collect or manage data and those that wish to use data must work together. Development of the National Biodiversity Network was initiated in 1996 to enable this process of change and improvement in access to biodiversity data and information to take place.

The origins of NBN

As early as 1984, many practitioners of biological recording recognised that the results of their field surveys and the associated data and information

were not being used effectively. Also, there was considerable duplication of effort, particularly in the collation and management of data sets. Professionals working in nature conservation and development planning made little use of the vast community of volunteers with specialist knowledge of species, communities and sites. In many cases, volunteers distrusted the uses to which others might put their data. Nevertheless, the Biological Records Centre had been set up in 1964 to collate, manage and disseminate data on the occurrence of species collected mainly by national specialist societies. These data are used mainly in nature conservation and biogeographic and environmental research. Many local biological records centres had been set up in the 1970s to serve some of the local needs for similar data. Unfortunately there was little communication between these two main sources and routes for data.

A working party on biological surveillance, set up by the Linnean Society of London, reported on these problems in 1988 (Berry 1988). Prompted by this brief report, the Co-ordinating Commission for Biological Recording (CCBR) was set up in 1990 following a high-level meeting of more than 30 organisations with an interest in biological surveillance in the UK. These early developments, and the context within which they took place, are described

by Wyatt (1992). CCBR carried out a detailed review of all aspects of biological recording in the UK, which was completed in 1994 (Burnett, Copp & Harding 1995). A draft of the CCBR report was used in the preparation of the UK's Biodiversity Action Plan (UKBAP), published in January 1994 (Cm 2428), which highlighted the need to underpin decisions effecting biodiversity with data and information. By this rather tortuous route, biological recording had become central to the UK government's ability to deliver its targets under the Rio Convention on Biological Diversity, to which it was a signatory in June 1992.

The development of NBN

One of the commitments of the UKBAP was to 'Improve the accessibility and co-ordination of existing biological data sets; provide common standards for future recording' (Cm 2428). This, combined with the detailed findings and recommendations of the CCBR report, helped promote an unprecedented partnership between governmental and voluntary organisations to form the National Biodiversity Network.

NBN started small and much of its activity in the first couple of years was to develop a business plan and seek funding for the plan and its component projects. The NBN project leaders and their managers soon realised that to develop a full national network, involving several hundred organisations, was potentially very expensive and also alarming, because nobody had ever done anything like it before. Unsuccessful bids for multi-million pound grants from the Millennium Commission and the Heritage Lottery Fund made us consider other routes by which the development of NBN could be funded. As a result, much of the developmental work of NBN in the last five years has been achieved by re-directing small areas of the work of organisations reliant on government funding. This enabled organisations to develop projects of direct benefit to their own business, but also of relevance to developing a national network. In this way, the Joint Nature Conservation Committee, English Nature, Scottish Natural Heritage, Natural Environment Research Council and Natural History Museum, in particular, have funded the development of key projects. A major non-governmental partner in NBN, The Wildlife Trusts, secured a three year grant from a charitable source to work with local records centres.

During 2001, significant new funding for several NBN projects has come from the Department of the Environment, Food and Rural Affairs and the Heritage Lottery Fund. The timeliness of all these developments is recognised in a recent UK Parliamentary sub-committee report on biodiversity, which stated that a successful National Biodiversity Network is a lynch-pin of the whole Biodiversity Action Plan process.

An overview of the NBN projects

The basic project structure of NBN is concerned with three main areas: establishing and maintaining standards, linking data sources, and disseminating and using data. For the NBN to operate effectively it is essential to establish, agree and maintain the necessary standards, establish access to and linkages between data stores and the internet, and to develop the tools that will create the internet network. Each project is led by an NBN Trust member organisation to manage and direct their individual projects towards the overall objectives of NBN. All the projects are closely inter-linked to ensure that the full range of relationships needed for establishing the NBN are clearly identified and maintained.

Standards

One way in which the NBN will achieve its aims is through the promotion of common standards as a context to recording. These standards include the maintenance of a national dictionary of species names, promotion of agreed recording methodologies, a data model for the help of those designing recording software and methods for transferring data. At the operational level the NBN also promotes standards for the care and management of records and the means whereby copyright and confidentiality of data can be properly protected.

One example of how these standards have been applied to developing a new resource is *Recorder 2000*. This is a powerful piece of biological recording software and a considerable advance over previous versions of Recorder. The software is built on a variety of standards. They include the NBN's 'data model', which shows how biological data can be managed within relational databases, a transfer format and NBN dictionaries for species, biotopes and administrative areas. Using Recorder 2000, biotope and site surveys can also be made and combined with species-based recording. Recorder 2000 is a

collect / collate system. This means that it is designed for individuals to collect their observations and pass them on to collation points. Recorder 2000 will be able to handle millions of observations, but it is not designed as a large corporate system that can provide access for hundreds of people.

The *NBN Dictionary* project will address the problems of nomenclature to enable the sharing of information about species and biotopes. Using the Dictionary it will be possible to translate between the names used in different sources of information, for example to relate the different scientific names used for the same species. The Species Dictionary is due to go live on the internet in November 2001.

Linking

NBN includes projects to link into the network many different types of organisations that are concerned with collecting, collating and managing data on species, biotopes and sites. These include three groups of organisational types.

- *Local records centres* – local, often county-based, foci to supply local needs for data, based mainly on local sources. There are about 50 local records centres in the UK, but they are unevenly distributed with many important gaps in coverage.
- *National societies and recording schemes* – specialist biological groups concerned with the survey and study of taxonomic groups, such as Odonata, Carabidae or Bryophyta. There are at least 70 such groups in the UK, but several major taxonomic groups are not covered by a society or scheme.
- *National data custodians* – a few organisations have an established position as custodians of their own and other people's data; for example the Biological Records Centre, Royal Society for the Protection of Birds, Marine Biological Association (especially the MarLIN project).

Disseminating and using data

The *NBN Index* will provide a facility for users of the NBN web site to find and browse information on UK biodiversity. The Index is still in development and is restricted to a very limited sample of biodiversity information that is being used as a demonstration to help gauge user requirements and to stimulate comments to guide further development.

The *NBN Gateway* is the system by which access,

via the internet, can be obtained to metadata about data sets and, through a system of control filters, to data and associated information. The pilot NBN Gateway was launched in autumn 2000 and the first phase of a complete upgrade of the Gateway has gone live at the end of September 2001 (www.searchnbn.net). The level of access that any particular user can get to a given data set depends on a) the level of access granted by the supplier of the data, and b) the status of the user. Wherever possible, NBN intends that an interested member of the public will be able to access basic information about the national distribution of a species or biotope. In addition they will be able to see some ecological information about the species or biotope and basic metadata about relevant data sets, so that if they want to find out more they will know whom to contact. Specialists will be able to access more detailed data through whatever control mechanism they have agreed themselves. For example, at the present time members of the Spider Recording Scheme can get access to draft maps and text for a new atlas of British spiders by registering with the scheme organiser. In return they are requested to comment on the maps and text, as part of a validation process.

The aim of the *Education and Public Access* project is to investigate the requirements for access to biodiversity information from the education sector (both formal and informal) and from the general public. This work has not yet begun, but important stages will be to review current initiatives and to undertake trials to test ideas and develop guidance for use in the future. The aim will be to close the gap between data and the successful widespread use of those data by a wide variety of audiences.

Managing NBN

NBN is an ambitious concept and a complex matrix of some 20 inter-related projects. It already involves more than 100 organisations at various levels, with funding for projects coming from more than 20 different sources, in addition to the 'in kind' contributions of time, especially by volunteers. The task of managing this strange organism falls to a small group of honorary Trustees led by a very active Chairman. The central NBN staff are a Programme Manager, a Company Secretary and one part-time administrative support post. The Trustees are advised by two Committees dealing, respectively, with finance and management, and policy and pro-

gramme. Communication and consultation between and among the individual projects is central to the success of NBN, ensuring that the inter-relationship of projects is recognised and responsibility for decisions is shared.

It could only happen in the UK?

I hope not because if we can make it work, with the scale and complexity of organisations involved in the UK, it could be simpler for other nations to take a similar approach to the problems of the supply, management and use of biodiversity data. Analogous systems have been set up or are being considered in several European countries. The real advantages of a more relaxed approach to the ownership of data, so that data can be used by more organisations for a wider range of applications, far outweigh the theoretical risks of misuse of data or perceptions of loss of 'ownership'.

A European perspective

We are still at the stage in the UK where NBN is proving to itself, to its component organisations and in particular to potential users and UK governmental organisations, that NBN can be useful to them. NBN is already beginning to think about an international perspective, but is unlikely to be able to take a lead at the present time. The standards adopted by NBN provide a potential model for international collaboration, but the NBN Gateway is the single most important concept and development in an international context. When the second phase of the Gateway is fully developed, it will be possible for anyone, in the UK or abroad, to gain access to data and information about UK biodiversity using the internet. In the longer term, the Gateway will enable the user to access data managed remotely on computers at many locations throughout the UK. It would be only a small technological step, but a major intellectual and administrative step, to use the functionality developed for the NBN Gateway to provide access to data held remotely in many countries.

P.T. Harding
Biological Records Centre
CEH Monks Wood
Abbots Ripton
Huntingdon PE28 2LS
United Kingdom
pha@ceh.ac.uk

In the past, even very simple international projects to collate and disseminate data on species distributions have been notoriously difficult to fund and resource, but the importance of publications such as the European atlases of flowering plants, breeding birds, mammals and amphibians and reptiles is self evident. In approaching a project based on international collaboration, it will be essential to understand who needs data, about what, and what they might do with data, and to demonstrate that international collaboration is possible and rewarding for all concerned. At the present time NBN is unable to do more than publicise what is being achieved in the UK, but NBN would welcome it if these successes in the UK could be used as a model for developments in other countries or internationally.

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Web site addresses:

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Internet access to data via the pilot NBN Gateway:
www.searchnbn.net
Biological Records Centre: www.brc.ac.uk