

**KEYNOTE**  
**“CRAYFISH ON THE NET” – USING THE INTERNET TO SHARE**  
**INFORMATION ABOUT CRAYFISH – AN EXAMPLE FROM THE UK**

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**ABSTRACT**

Sharing information and building on the findings and experience of previous work is central to most scientific activity. The Internet is now a powerful and almost limitless medium to do this efficiently. The example used is the National Biodiversity Network's Gateway ([www.searchnbn.net](http://www.searchnbn.net)) through which data on the distribution of native and introduced species of freshwater crayfish in the UK are now accessible via the Internet. The NBN Gateway enables data owners and custodians to provide controlled access to their data for other users. Users are able to examine species data in relation to other spatially referenced datasets, such as the boundaries of designated and protected sites, and to link to other sources of information.

**Key-words:** native and introduced crayfish, linking datasets, Internet, National Biodiversity Network, United Kingdom.

**LES ÉCREVISSSES SUR INTERNET**  
**UTILISER L'INTERNET POUR PARTAGER LA CONNAISSANCE.**  
**UN EXEMPLE DU ROYAUME-UNI**

**RÉSUMÉ**

Le partage de l'information est vital pour la recherche scientifique car les chercheurs d'aujourd'hui contribuent à poser les fondations du travail des chercheurs de demain. L'Internet constitue une plate-forme efficace et quasi sans limites pour les échanges d'information. L'exemple présenté ici est le « National Biodiversity Network's Gateway » ([www.searchnbn.net](http://www.searchnbn.net)), site sur lequel on peut retrouver la distribution géographique des écrevisses autochtones et introduites au Royaume-Uni.

Grâce au NBN Gateway, les chercheurs et les gestionnaires peuvent fournir un accès contrôlé à leur banque de données à d'autres usagers. Ces derniers peuvent référer aux données sur certaines espèces en rapport avec d'autres types d'information, telles les aires désignées ou protégées. Plusieurs liens vers d'autres sources d'information sont également disponibles sur le site.

**Mots-clés :** écrevisses autochtones et introduites, base de données, Internet, National Biodiversity Network, Royaume-Uni.

## INTRODUCTION

There is a long tradition of sharing scientific information. Few scientific discoveries are truly original because, inevitably, they are based on previous work. Even the description of new species depends on related taxa having been described previously using accepted characters, irrespective of whether these are morphological, biochemical or genetic. This tradition of sharing is international, although language can sometimes present a barrier. Until recently the conventional media for sharing information were by publication (in journals and books) and by meeting (at seminars, workshops and conferences).

However, sharing information can present difficulties for the professional scientist, at least until the scientific value has been fully exploited. This value is usually expressed as the potential for further research, for commercial exploitation or for academic kudos from publication. In the UK these are important issues for many professional scientists, but, at the same time, there is increasing pressure on them to share data and information. For example, because most professional scientists are funded by governmental sources derived from public taxation, hoarding data and information is seen to be contrary to the public interest.

Information and data are proliferating and it is increasingly difficult to keep up-to-date using the traditional routes of publications and meetings. The Internet provides a solution to disseminating data and information and to gathering them.

## USING THE INTERNET

The Internet enables rapid searches from many potential sources. The formats used to disseminate and to gather data can be flexible. It is inexpensive to use and can be accessible anywhere at any time, provided that you have a computer linked to the Internet. We have all learned to use E-mail within the last 10 years and probably would not want to be without it for rapid communication. But the Internet is not without problems for users. All too often so-called "intuitive" search facilities have been built for the convenience of the computer specialist rather than the practical user. When you find the source you are looking for, often the content disappoints because it is incomplete or out of date. As with any new development, these problems are due to the novelty of the Internet medium and our inexperience, rather than inherent problems of the medium itself.

## UK BIODIVERSITY DATA ON THE INTERNET

The National Biodiversity Network (NBN) ([www.ukbiodiversity.net](http://www.ukbiodiversity.net)) has been established to facilitate the mobilization, sharing and use of data and information about the biodiversity of the UK. It began in 1996 and was formalised as a charitable Trust in April 2000. NBN has been formed by a consortium of statutory, non-governmental and voluntary organizations with an interest in mobilizing, sharing and using data on UK biodiversity for conservation, research, planning and public outreach. Such a national system was proposed in the UK Biodiversity Action Plan (CM 2428), based on the findings for the Co-ordinating Commission for Biological Recording (BURNETT *et al.* 1995).

The NBN Gateway ([www.searchnbn.net](http://www.searchnbn.net)), which uses the Internet to provide controlled access to data and information, is central to the identity and success of NBN. The suppliers of data, normally at the level of a data custodian such as English Nature, the Biological Records Centre, a national voluntary society or a local records centre, define and control the levels of access for each dataset they give access to via the NBN Gateway. The Gateway is still being developed and populated with datasets.

## UK CRAYFISH – THE RESULT OF TWO SURVEYS

Data and information relating to freshwater crayfish in the UK are now accessible on the Internet via the NBN Gateway, based on two spatially referenced datasets on the distribution of native and introduced freshwater species. Despite their differing origins and contents, these two datasets have common temporal, spatial and taxonomic information. This allows their direct comparison and the ability to show the spatial distribution of a single species.

### Nottingham University data set

The data set was compiled by David Holdich and his colleagues at Nottingham University under various contracts to the Environment Agency and English Nature (formerly the National Rivers Authority and Nature Conservancy Council), and the Natural Environment Research Council. The dataset, covering Great Britain only, was compiled from many sources (HOLDICH, *et al.*, 1995) with records covering the period 1900 to 1996. The data were computerized and are managed by the Biological Records Centre (BRC) ([www.brc.ac.uk](http://www.brc.ac.uk)) on behalf of English Nature and the Joint Nature Conservation Committee (JNCC). It was one of the first datasets to be made accessible when the NBN Gateway was launched in September 2000.

### Environment and Heritage Service (EHS) dataset

The EHS in Northern Ireland commissioned surveys of crayfish in the Lough Erne and River Blackwater catchments in 1996 ([www.answer-online.org/project\\_more\\_details.asp?proj\\_id=1411](http://www.answer-online.org/project_more_details.asp?proj_id=1411)), the computerized results of which are managed by the Centre for Environmental Data and Recording (CEDaR) ([www.ulstermuseum.org.uk/cedar/](http://www.ulstermuseum.org.uk/cedar/)) at the Ulster Museum in Belfast.

### Metadata for the datasets

Metadata (descriptive data about each dataset) are available on the NBN Gateway.

## HOW THE NBN GATEWAY WORKS

Logging into the NBN Gateway Homepage and using the initial search facilities for “crayfish” reveals metadata for the Nottingham and EHS crayfish datasets, including basic temporal and geographical metadata.

If a “Google” type search is undertaken via the NBN Gateway, using the name *Austropotamobius pallipes* or the English name “white-clawed crayfish”, then 30 results appear, including live links to other websites. The Nottingham and EHS datasets can then be interrogated further using the standard facilities of the Gateway. Summary distribution maps of native and alien crayfish species can be called up for various time periods. In addition, interactive maps allow access for registered users to detailed data and associated metadata for individual records. Live links to other websites/datasets can be used, for example to get a list of the Special Areas of Conservation where *Austropotamobius pallipes* occurs in the UK ([www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1092](http://www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1092)).

## CONCLUSIONS

Through Craynet a debate on the mobilization of data on freshwater crayfish in Europe has begun and Pierre Noël (workshop at Kilkenny Craynet meeting, June 2003) has described proposals for collating and publishing Europe-wide data. The purpose of my Keynote lecture “Crayfish on the Net”, was to present an example of what can be achieved



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v2.x

Welcome to the NBN Gateway, an on-line service devoted to sharing biodiversity information. We are part of a wider initiative called the National Biodiversity Network. Please use the tools below to explore the biodiversity data we currently have available.



**News** 

Our database will be upgraded on 12-14 March. During this time you will not be able to access data on the Gateway.

**We are sorry for any inconvenience**

FAST LINKS TO DATA

DATASETS	SPECIES	SITES (e.g. SSSIs)
<ul style="list-style-type: none"> <li>- That you have access to</li> <li>- List all available</li> </ul>	<ul style="list-style-type: none"> <li>- Available datasets</li> <li>- 10km dot maps</li> <li>- Interactive maps</li> <li>- In special sites (e.g. SSSIs)</li> </ul>	<ul style="list-style-type: none"> <li>- Available datasets</li> <li>- Important species</li> <li>- Full species list</li> <li>- Interactive map</li> </ul>

**LOG IN**

User Name 
Password 
log in

Help! I have forgotten my password  
I would like to get a username and password.

**SEARCH**

The NBN Gateway search engine is currently referencing a limited amount of content, though we hope to increase it soon.

Search

Get some hints on how to get the best results from it.

by sharing data and information using the Internet and to provide a few, simple thoughts for the future for those involved with Craynet.

### Thoughts for the future

1. **Up-to-date, reliable, interpreted information** is required to enable informed and accountable decisions to be made about European biodiversity. The issue has, in the past, been that decisions could be made and actions taken without such information. It is now increasingly accepted that accountability for decisions and actions is almost as important as the decisions and actions themselves.

2. **“Historical” information provides a context for recent data.** Although users of data normally claim they want the most recent, up-to-date and comprehensive data, few users are prepared to invest in the collection, collation and management of such data. For this reason “historical” information (which for some particularly demanding users may mean from the previous year or even more recent!) may be as good as there is. Also, historical data, spanning several decades, provide an unique resource to measure changes in range and to indicate where populations occurred in the past, for example to inform remedial actions and re-introductions (SIBLEY, et al., 2002).

3. **Sharing data makes sense.** Much of the collation and management of biodiversity data in Europe depends, ultimately, on governmental funding although this is often through tortuous routes of contracts or grants from agencies or academic institutions. The collation and management that is not government funded, and some data

collection, is done by volunteers who support the conservation of biodiversity. Former practices, where governmentally funded organizations were reluctant to release data and information, even to well intentioned non-governmental organisations, are now largely a thing of the past. In the UK, the NBN offers an unique opportunity for sharing biodiversity data to the greater benefit of species and their habitats. It is probably not apocryphal to suggest that, in the past, more sites and species have been lost or threatened as a result of data not being shared than have been lost or threatened by data being “misused” as a result of wide access to them.

4. **Collecting, collating, managing and disseminating data is expensive.** This is an undeniable fact, and information technology has not significantly decreased the cost, but it has made the overall process more efficient and accessible. **But...**

5. **Sharing effort reduces the overall costs.** A more integrated approach to the collection, collation, management and dissemination of data could bring savings and other benefits for all. Several organisations, and individuals, sharing the effort by contributing financial resources, skills or facilities as appropriate, could achieve a greater whole than would be possible by separate initiatives, and they would avoid costly overlap and duplication of effort.

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Note added in proof:

The NBN Gateway has continued to grow and develop since this paper was presented in June 2003. A new version of the Gateway was launched in June 2004 including new functions, additional datasets and a redesigned Home page. The URL is unchanged [www.searchnbn.net](http://www.searchnbn.net).