ENGLISH NATURE

Report Number
617

The National Biodiversity Network Southwest Pilot Project

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Final Project Report
September 2004

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ISSN 0967-876X

Acknowledgements

We warmly thank all the partners in the project and the NBN Trust officers who supported this work. Particular mention should be made of the LRCs and voluntary recording groups who have been instrumental in delivering the inventories and helping us demonstrate that the NBN can deliver valued products and services. We hope to maintain these productive partnerships into the future.

Executive summary

The NBN South West Pilot Project was initiated in April 2001 and completed in March 2003. The Project, centred on the South West Government Region, was led by English Nature but comprised a wider partnership including six Local Record Centres, Environment Agency, JNCC, RSPB, Butterfly Conservation, Herpetological Conservation Trust, Marine Biological Association and the National Trust. Several other partners engaged in the project less formally including Defra, the SW Regional Biodiversity Partnership, Regional Observatory and LBAP groups.

The aims of the Project were to test whether the National Biodiversity Network could be effectively employed at regional scale to deliver information products and services of value to the project partnership. If so this would provide a basis for developing the network nationally. A key aim of the Project was to consider the role of Local Record Centres (LRCs) in the network.

The key products delivered by the Project have been regional BAP priority habitat inventories. English Nature has commissioned LRCs to develop and deliver these products based entirely on a collation of existing data originally collected by a range of partners. The South West region is now the first region in the UK able to quantify and map the existing priority habitat resource. The methodology developed has been propagated nationally with the support of central government grant-aid so that now 23 habitat inventories are available via the English Nature website. In the South West a demonstration set of 25 species inventories have also been produced, with LRCs being the main data contributors although of course these data were generally originally sourced from volunteers.

The inventories have been used in a range of contexts but particularly in support of the UK Biodiversity Action Plan (BAP). We have shown that they are absolutely critical to the cost-effective delivery of Biodiversity Action Plan targets. This has been demonstrated very clearly by the Defra projects. We have also demonstrated for the first time how they can be used as a sampling framework to assess outcomes associated with the BAP process and specific conservation programmes such as Agri-environment schemes. Use of the information brings significant influence and there are major benefits from investing in information as a tool to target the resources of others. This is particularly the case in the wider countryside outside of the statutory site network.

We tested the NBN Data Exchange Principles and the standards and tools developed by the NBN Trust to support data sharing. These standards were valued by the project partners, but adoption can be time consuming and their application must be targeted to those situations where benefits are greatest. We also tested the NBN Internet Gateway as a data sharing tool. In summary the NBN Gateway can and should be the main mechanism for delivering access to data on biodiversity but some considerable focussing is required on key audiences and their specific needs if it is to become a viable and robust tool for nature conservation professionals and amateurs alike.

Our key finding is that collations of existing data collected locally by volunteers and others, when shared more widely, can meet regional and national needs. This data if shared through the NBN framework will be critical to the update of the inventories and meeting wider user

needs. The most significant constraint to enhanced sharing of data is adequate provision of data custodianship services, particularly in the LRC and voluntary sectors.

We have considered how the NBN should develop beyond the South West Pilot Project and how we can address some of the very real resource, coordination, communication and skills issues that hold back the NBN initiative.

We propose a regional approach to building data custodianship capacity, and that this capacity should be built from the existing fragmentary network of LRCs and the voluntary sector rather than starting afresh. Data sharing depends on relationships and trust, and these bodies have built this trust over an extended period. Adequate resource needs to be put in place to deliver key products, and up-to-date inventories are the most important of these in a UK BAP context. Development of a national habitat inventory programme should be given first priority, followed by phased development of a species programme.

We make 17 recommendations based on our experiences during this project. These recommendations must be acted upon by the parties concerned if the NBN is to realise its potential in a reasonable timescale.

The NBN is at a crossroads in its development. The time to talk of long-term visions and concepts and prototype is over. The NBN partners must focus on specific needs and ensure that the NBN becomes an operationally robust mechanism to meet those needs. If not, the network will not be sustained in the longer-term and realise the enormous potential that all partners recognise.

Contents

Part 1 Introduction and approach

Introduction

This report provides a summary of the key objectives, activities, outputs and recommendations of the National Biodiversity Network South West England Pilot Project (hereafter referred to as 'the Project'). The Project encompassed a wide range of activities and sub-projects. Our intention is not to document all of these in detail, rather we to provide an accessible mechanism for readers to gain an understanding of the two key elements to the project:

- Capturing the key lessons that have become apparent as we have tested NBN working approaches for collating and sharing data during the course of the project
- Demonstrating and evaluating how the wildlife data collated and used through NBN partnerships can be used by a wide range of organisations and individuals

This report therefore aims to summarise and capture key messages. Hyperlinks are used extensively as a means of accessing more detailed reports and accounts of sub-projects. Where appropriate, we provide links to additional material hosted on the NBN website (http://www.nbn.org.uk/swpilot). This includes more detailed project reports by partners and in some cases Microsoft PowerPoint presentations that provide access to further images and examples.

Also available is a Technical Report that provides detailed information on the standards developed relating to data capture and manipulation techniques and data exchange policy. This is also available via the NBN website and as hard copy from the English Nature Enquiry Service (Tel: 01733 455101 Email: enquiries@english-nature.org.uk).

Annex 2 provides a short NBN 'Toolkit' primarily aimed at English Nature staff. This short document briefly outlines some of the key functions that the NBN Gateway (combined with English Nature's Nature on the Map website) can fulfil and provides a simple 'way in' to using the NBN for the new user.

English Nature led and managed this project on behalf of a project partnership that comprised 7 Local Record Centres, Butterfly Conservation, RSPB, Herpetological Conservation Trust, National Trust, Environment Agency, Defra, and JNCC. The project was integrated within the wider NBN Trust programme of projects and drew upon contributions from NBN Trust officers and data contributors that uploaded data to the NBN Gateway either before or during the project (notably the Biological Records Centre and its voluntary data suppliers). We have used a range of methods to gather these contributions, including more formal reports, and informal workshops. Often we provide direct quotations from partners where these capture salient points well. This report therefore aims to represent the 'partnerships view' of the project and NBN – including both positive and negative elements.

Background: Why did we need a project in the first place?

Ideally, information on the distribution and status of wildlife should form the evidence-base for all decisions related to nature conservation. This includes target setting, activity planning

and monitoring outcomes. In recent years the nature conservation sector has been encouraged to develop a more planned and strategic approach to conservation activities, most notably driven by the UK Biodiversity Action Plan (BAP) process. Both nationally and regionally there is an increasing requirement to deliver and report on key biodiversity targets. Major drivers for this are EU directives, UK BAP and Defra's Public Service Agreement targets for SSSIs and farmland birds. These are all key drivers that require efficient access to relevant and dynamic data on the state of wildlife on both designated sites and in the wider countryside.

In response to this requirement and wider needs a National Biodiversity Network (NBN) was initiated with the aim of using internet and GIS technology to collate data from a network of contributors and disseminate biodiversity information to the widest possible range of users through a single Internet Gateway (http://www.searchnbn.net/). In particular this includes a commitment to support the development of a network of Local Record Centres (LRCs) and National Voluntary Recording Groups as data custodians and disseminate it through the NBN. A number of other NBN partners such as the Environment Agency, Forestry Commission and other national organisations may choose to contribute data to the network directly, acting as data custodians themselves.

The Co-ordinating Commission on Biological Recording (1995) identified that around 2000 organisations collect species records and volunteers contribute the major proportion (70%) of records collected. Therefore a significant and growing body of data on species exists. However, it is often not accessible for a range of reasons. The NBN was developed to overcome these accessibility problems.

Data on habitat distribution, extent and condition was very poor. Both the UK Habitat Action Plans and Species Action Plans are fundamentally dependent on information on the distribution and status of habitats. Thus a key aim of the project was to address the shortfall in habitat information.

Before the SW pilot the following issues prevented English Nature and its partners from gaining access to information on biodiversity:

- uncoordinated data collection both within and between organisations with no consistent standards for data collection;
- no single access point for the information that existed so accessing data was time consuming;
- the large volume of species data was inaccessible due to the above. Voluntary recording groups lacked the resources to co-ordinate survey and manage datasets in a consistent way;
- patchy and inconsistent habitat data, combined with problems of classification meant that very little data was available on the distribution of BAP priority habitats;

The NBN emerged as the potential solution to the problems identified by the CCBR report. In 2000 it existed largely as a theoretical, prototype system with a set of draft standards and tools. The Project set out to test whether the NBN approach could deliver the information needs of the partnership, and if so, to develop strategies that would develop the NBN nationally into an operational tool for its partners.

The South West Region already had full coverage of LRCs, although at different stages of development. Four were well established and three others were at earlier stages of development. Voluntary recording was very active though often not well co-ordinated. The region had strong partnership organisations, including the regional government office and a regional biodiversity group. Other potential partner organisations included local authorities, the wildlife trusts, RSPB, National Trust, Forestry Commission, Environment Agency, DETR and MAFF (now Defra).

Objectives

The objectives of this Project were:

1. To test the concept of the National Biodiversity Network through the development of a network of Local Record Centres and other data suppliers in the South West region.
2. To identify local and national biodiversity data needs for the region and develop and trial mechanisms of data flow that satisfy those needs.
3. To facilitate sustainable long-term wildlife data collection by both volunteer networks and larger organisations
4. To produce mapped inventories for all Biodiversity Action Plan priority habitats in the South West Region.
5. To demonstrate to all partners the benefit of the NBN and habitat inventories in facilitating delivery of Biodiversity Action Plan targets and other nature conservation policy objectives.

Scope

This project was confined to the South West Region of England, which includes the counties of Cornwall & Isles of Scilly, Devon, Somerset, Dorset, Wiltshire, Avon and Gloucestershire. The focus for this project was the demonstration of the full operation of the NBN from the regional scale downwards, hence all processes associated with biological data collection, management and use were potentially within scope.

The Project focused on biodiversity information for terrestrial, freshwater and marine habitats and species. Particular focus was to be placed on habitats and species identified in the UK Biodiversity Action Plan.

The Project aimed to engage a wide forum of data providers and users, although particular attention was given to the role of Local Record Centres and English Nature staff as data users and providers.

Terminology

Poor use of terminology within the NBN leads to confusion. We have used the following terms extensively throughout and have tried to be consistent in their use.

The '**NBN'** is the National Biodiversity Network in its entirety, including all data sharing partnerships however data is shared. This includes voluntary recording groups, Local Record

Centres, large biodiversity organisations and other partners and the framework of standards, tools and Gateway that supports it.

The **NBN Trust** is the umbrella body (comprised of representatives from the key partners of the NBN) that oversees the development of the NBN initiative.

The **NBN Gateway** is the Internet portal that is promoted as the key mechanism for providing access to data within the network.

A **data custodian** is an individual, group or organisation that collates, manages, updates and disseminates biological information. Custodians may undertake other tasks such as data collection and interpretation though this is not a core part of the role.

The Project approach

The project started in April 2001 and ended in March 2004. Over the first year of the project a partnership was established comprising 7 Local Record Centres (4 well developed, 3 in early stages of development), Environment Agency, JNCC, National Trust, Butterfly Conservation, Herpetological Conservation Trust, RSPB and English Nature.

A memorandum of agreement (MoA) was established between all partners. This MoA provided the framework for administering the partnerships and advising the Project Officers. Each partner agreed to an organisation-specific Annex to the MoA that defined their responsibilities. Different partners had different positions within the partnership. The Local Record Centres were considered 'working partners' and had a funded 'contractual' agreement with English Nature to deliver key products and sub-projects. The other partners were contributing their own staff time to the project and were largely involved in the project to explore the potential of the NBN and its working approach. Consequently the extent to which they engaged with the project varied according to their own internal priorities.

The Project was managed by English Nature's NBN Officer (Mike Burke), and co-ordinated locally by an English Nature funded Project Officer (Ben Totterdell). The project was overseen by a steering group comprised of representatives from all the key partners in the project, though the 7 LRCs were represented by 2 LRC managers, one from Cornwall, the other from Somerset. The group met every six months and was particularly important in identifying the information needs of partnership and establishing the project. Most of the subsequent project work was managed through bilateral meetings between the Project Officer and individual partners.

The Project Officer (in some cases working through Local Record Centres) also forged links with other data contributors and users, including regional bodies such as the South West Regional Assembly, Regional Observatory, Regional Biodiversity Forum, South West Wildlife Trusts, Forestry Commission and South West Data Intelligence network. Links were also developed with National and Local Voluntary Recording Groups and sub-regional organisations such as National Parks, AONBs, Local Authorities and LBAP partnerships. The results of some of that work are presented here.

English Nature was the prime financial contributor to the project, but all the partners contributed significant staff resources and data. Annex 1 provides a breakdown of how financial resources were spent in the project. The NBN Trust in particular contributed

through the work of the NBN Access & Accreditation Officer and latterly the NBN Technical Liaison Officer. Defra contributed ca £90k in the last two years of the project to support work on targeting agri-environment schemes using data from LRCs.

The data requirements of the partnership

At the start of the project, we set out to define the broad information requirements of the project partnership. We did this by two main mechanisms:

- through bilateral discussions between the project staff and the project partners, and
- consultation with English Nature local staff through a series of workshops across the region

These activities helped us identify two key information priorities:

- the sub-regional distribution and status of all BAP priority habitats present in the region;
- the sub-regional distribution of a short-list of species, most of which were on the BAP list;

We therefore focussed on developing sufficient specific data content within the NBN to 'demonstrate' its value to as wide a range of users as possible. We did not aim to mobilise all available data. In order to keep the data collation and manipulation task manageable the habitats' work was focussed primarily on terrestrial habitats in the South West (Table 1.1). We focussed on 25 species as a 'demonstration' dataset. This short-list was largely made up of BAP listed species that project partners had lead responsibilities for (Table 1.2).

All partners needed the information delivered to be as precise as possible (point records ideally at Ordnance Survey 6-fig precision or polygons defined in GIS) to enable records to be linked to individual land parcels. They also needed the specified information to be dynamic, up-to-date and as complete as possible for the region.

Implicit in this focussing of priorities was the assumption that "10% of the data is used 90% of the time". We explicitly aimed to focus on this 10%. This represented a significant risk. Our ability to demonstrate benefits was dependent on the accurate selection of data priorities. Was the partnership clear enough on its priorities? The understanding and extent of detailed thinking on this varied between partners. Many partners welcomed English Nature's willingness to open up a dialogue and make suggestions as to what the priorities might be.

In practice there were few disagreements about the priorities. This was partly due to the fact that our partners saw the UK BAP as the key driver – this helped focus minds and align thinking on the priorities.

Table 1.1. List of priority habitats targeted for development of inventories in the project.

Blanket bog	Lowland mixed deciduous woodland
Coastal saltmarsh	Lowland wood-pastures and parkland
Sand dunes	Mudflats
Coastal vegetated shingle	Purple moor grass and rush pasture
Lowland beach and yew woodland	Reedbeds
Lowland calcareous grassland	Sabellaria alveolata reefs
Lowland dry acid grassland	Upland heathland
Lowland heathland	Upland mixed ashwoods
Lowland meadows	Upland oakwood
	Wet woodland

Table 1.2 Species selected for development of species inventories within the SW Pilot

Latin Name	**Common Name**
Arvicola terrestris	Water Vole
Asilus crabroniformis	Hornet Robber Fly
Austropotamobius pallipes	White clawed crayfish
Caprimulgus europaeus	Nightjar
Carabus intricatus	Blue ground beetle
Cetorhinus maximus	Basking shark
Coenagrion mercuriale	Southern Damselfly
Cottus gobio	Bullhead
Embiriza cirlus	Cirl Bunting
Embiriza schoeniclus	Reed Bunting
Eunicella verucosa	Pink sea fan
Eurodryas aurina	Marsh Frittilary
Fissidens exiguus	Tiny fern-moss
Hydrelia sylvata	Waved Carpet Moth
Hygrocybe calptraeformis	Pink meadow cap
Lepus europaeus	Brown hare
Lipsothrix nervosa	Cranefly
Lutra lutra	Otter
Melittus melissophylum	Bastard Balm
Muscardinus avellanarius	Dormouse
Pseudanodonta complanata	Depressed river mussel
Rheumaptera hastata	Argent and Sable Moth
Rhinolophos ferrumequinum	Greater Horseshoe Bat
Rumex rupestris	Shore dock
Sium latifolium	Greater water parsnip
Triturus cristatus	Great crested newt

Lessons from the information requirements scoping	
Positive	Considerable overlap in partner information requirements
	UK BAP has focussed and aligned priorities and this encourages partnership working. Lead partners focussed on their BAP responsibilities.
	Partners welcomed English Nature's willingness to lead the dialogue on information priorities
Negative	Many partners not clear about their requirements. None had conducted a strategic assessment of their biodiversity information needs and most tended to ask for 'everything'.
	Partners may have considered their needs more closely if they were asked to contribute financially. This may have flushed out more conflicts in priorities.
	Partners vary in the scope of their requirements with respect to habitats and species. For example, English Nature has a wide-ranging requirement compared with Forestry Commission's woodland remit.
Key learning point	**BAP has helped align partner information requirements. This creates opportunities for partnership working.**

Meeting the information requirement

Introduction

The South West Project Officer took the lead in co-ordinating activity to meet the information requirements of partners. The approach taken adopted the following simple principles:

- that we would focus on getting the partners and other data contributors to supply existing data to the NBN Gateway and that we would only ask them to contribute data that met the partnership requirements;
- that the project would not initiate new field survey as a means of meeting the requirements;
- partners were encouraged to provide full access at the highest resolution to project partners

We envisaged that partner contribution of data would accomplish two aims: it would help meet the regional requirements, whilst also providing a practical opportunity for partners to develop a better understanding of NBN data standards and data exchange policy.

Data Audit

Both English Nature and the LRCs conducted a data audit as the first task of the project. This involved cataloguing and collecting metadata on all key datasets held. Emphasis was placed on the following:

- habitat data whether electronic or paper-based;
- species data available electronically.

At the time of commissioning the work there were no agreed NBN standards or guidance on metadata collection and capture. English Nature therefore drafted guidance with the help of JNCC. By the middle of the project the NBN Trust had produced a more mature and formal set of standards – these were tested with LRCs and other data contributors within the project and the results of this are documented in subsequent sections. The detailed standards developed are documented in the Technical Report.

English Nature had commissioned metadata collection activities before but never kept these up-to-date, so a new exercise was required. None of the LRCs had conducted a formal audit of their data holdings before and so it represented a significant task.

By June 2001 all LRCs had completed their audits and were in a position to assess the extent to which their data holdings would be able to meet the partnership's information requirements. All of this metadata was then loaded to the NBN Index and made openly accessible.

Some other partners initiated metadata exercises, as a precursor to contributing data to meet the partnerships needs.

Lessons from the data audit exercise	
Positive	The audit helped clarify important details about datasets, such as ownership, format, location and any key constraints. This information was needed before the data could be used.
	The audit also provided a means by which to do a strategic assessment of data gaps
	Simple metadata that provides basic information on the dataset and enables users to assess quality and constraints is valuable
Negative	Unless maintained and updated the metadata quickly loses value
	Can be time-consuming and there is a law of diminishing returns if the standards applied are too detailed
	Metadata must be accurate – this depends on metadata compilers having sufficient knowledge of the datasets – often not the case for older datasets
Key learning point	**Ensure metadata collection is 'fit for purpose'. Unless is it actively used and updated it can be a wasted investment**.

Habitat inventories

Aims

The project aimed to develop regional 'inventories' of all terrestrial BAP priority habitats. These inventories would describe the distribution and extent of each habitat in the South West. The inventories would be GIS-based and had to be usable at local and regional scales.

The situation at the start of the project

The audit identified that a number of habitat datasets existed, classified according to a range of systems, including NCC Phase 1, National Vegetation Classification (NVC), BAP Broad Habitat and various others. These data existed in a range of formats, both paper and electronic. There were no data in the South West explicitly classified by BAP priority habitat. There were also no relevant standards for capturing habitat data to GIS.

The methodology employed

We were faced with a decision on how to proceed. There were two clear options:

Option 1: Capture and mobilise existing habitat data through the NBN Gateway using its existing classification and allow users to interpret it according to their needs.

Option 2: Given the requirement for information on BAP priority habitats, develop a set of standards for interpreting existing habitat data and capture a new dataset to the BAP priority habitat classification.

Given the poor fit of existing habitat classifications to the BAP classification and potential for confusion of users associated with option 1 we adopted for the more resource-intensive option 2. This involved several key stages, the detailed standards for which are covered by the Technical Report:

- develop mappable habitat definitions for all priority habitats;
- define mapping protocols and interpretation rules;
- develop generic GIS standards for capturing habitat data;
- secure access to relevant source datasets, establishing licence agreements where necessary;
- commission the data collation, interpretation and capture work with LRCs.
-

LRCs were commissioned to conduct the data capture work because they were the only organisations collating habitat survey information on a regular basis in the region. They also managed and held the second tier wildlife site information on behalf of local authorities, which we believed would be a key data source. We also perceived benefits of employing their local knowledge to help verify the inventories. The LRCs also had experience of data capture to GIS and we wanted to get their input to developing the methodology.

More detailed methodological information, including the habitat definitions and GIS standards are included in the Technical Report.

Mappable habitat definitions

It was important that we had a set of usable definitions prior to beginning the data capture process. This would be a key tool to enable the habitats to be mapped to common standards and pooled to deliver regional (and ultimately national) products. This involved a substantial amount of work from the Project Officer, South West LRC staff and English Nature habitat specialists. Taking the Habitat Action Plans as a starting point, definitions were developed that clarified the following:

- The relationship between UK BAP priority habitats and other existing habitat classification systems such as NVC and Phase 1.
- Protocols for defining the separation between different UK BAP priority habitats, including where there was allowable or unavoidable overlap between two or more habitats.
- The key physical and ecological parameters of Priority Habitats that may influence their mapping such as altitudinal range, % tree cover and soil type.

Although still in a draft form, and subject to further revision where necessary, they have already proved a vital tool to enable region-wide habitat mapping to common standards.

Mapping protocols

As well as the definitions themselves, it was also essential to develop a number of protocols that defined in more detail how specific mapping issues should be tackled. Some of these were generic, such as use of Ordnance Survey base mapping, while others were habitat-specific. In order to encourage consistent application of data capture standards a specific 'data capture' software tool was developed. This tool was fundamental to ensuring consistent application of standards and therefore enabled data capture to occur at several LRCs without compromising the ability to quickly collate the data at regional scale.

A key aim was to deliver inventories of known quality. For this reason we focussed on developing metadata and polygon attribute data standards that enabled the user to assess the data sources used, their age and original classification.

We also expected the interpretation of existing data to result in polygons having different levels of certainty of habitat determination. For this reason we developed four main categories of determination:

'**Definitely is**' – sufficient source information to clearly determine the priority habitat for a given polygon.

'**Probably the priority habitat but some uncertainty of determination**' – insufficient source information to clearly determine the habitat type.

'**Close to the priority habitat**' – sufficient information to determine that the habitat is close to the priority habitat but does not meet the quality standards.

'**Definitely present but not mappable**' – was used where the habitat was known to be present in the polygon, but it either co-occurred with other habitats as a mosaic or the source data was not good enough to separate them.

By attaching this information to polygons in the inventory we provided a mechanism for users to select those sites that met their specific needs and hence provided a dataset flexible in potential application.

Outputs: The habitat inventories

The seven South West LRCs first produced the inventories on a county basis. Each LRC was provided with a copy of the "data capture tool". The Project Officer coordinated the process, using the predefined mappable definitions and protocols to ensure uniformity of approach. Data was delivered to the Project Officer for quality assurance and evaluation at the end of each financial year.

At the end of project year 2 and 3, the data was then combined into regional datasets allowing region wide habitat mapping for the first time (Figure 1.1).

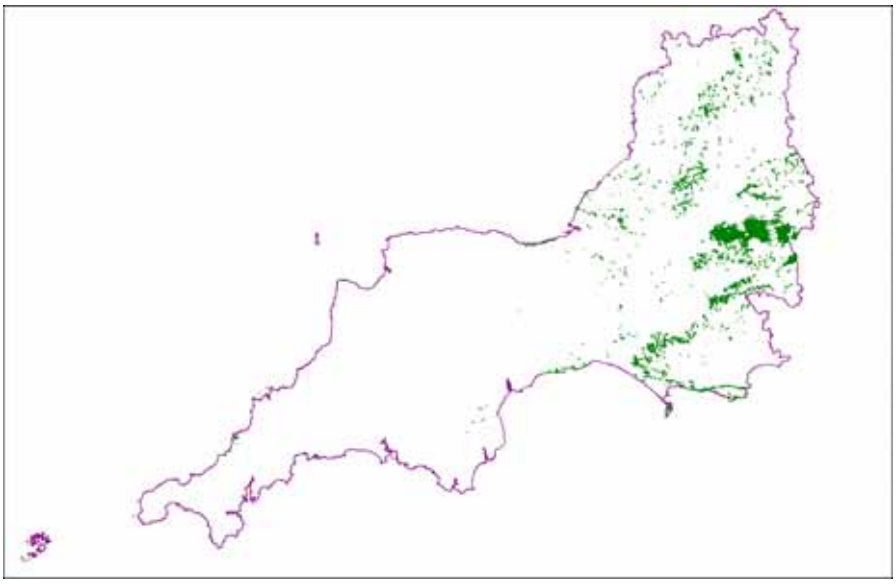


Figure 1.1. The regional inventory for lowland calcareous grassland.

Outputs

Table 1.3 lists all of the inventories developed in the South West and the number of polygons (sites) and extent of each inventory. This figure should not necessarily be taken as the current known extent of each habitat in the region as the figure includes all habitat -determination categories.

Table 1.3 The number of polygons and extent of each of the habitat inventories developed in the South West.

Priority Habitat	Number of Polygons in Inventory	Total regional area of inventory (ha)
Blanket bog	343	12,651
Coastal saltmarsh	624	2,061
Sand dunes	30	1,234
Coastal vegetated shingle	102	197
Lowland beach and yew woodland	513	3,178
Lowland calcareous grassland	3522	27,060
Lowland dry acid grassland	551	3,188
Lowland heathland	1,871	18,280
Lowland meadows	2,834	8,396
Lowland mixed deciduous woodland	2,773	29,703
Lowland wood-pastures and parkland	46	1,055
Mudflats	708	8,459
Purple moor grass and rush pasture	2,290	6,132
Reedbeds	77	121
Sabellaria alveolata reefs	57	93
Upland heathland	446	9,339
Upland mixed ashwoods	952	4,142
Upland oakwood	1,208	7,892
Wet woodland	1,542	4,784
Totals	**20,484**	**147,781**

Lessons from the habitat inventory mapping process	
Positive	The development of mappable definitions and protocols has enabled the production of region-wide habitat inventories to common standards from an aggregation of countywide datasets.
	Local Record Centres working together to common standards can produce high quality, regional information products.
	Learning by doing was an effective way of refining and developing the definitions. Further consultation with specialists would have compromised the ability to deliver the products within the project timescale and would not have identified all the issues.
	It was possible to develop a product that was flexible enough to meet a wide range of needs.
Negative	The constant updating of habitat definitions and clarifying of protocols in the light of mapping can be resource intensive. The work done prior to the onset of data capture was vital to its delivery. Common standards enabled regional mapping.
Key learning point	**Investing in the collation and interpretation of existing data is the most effective first step to establish inventories.**

Species inventories

Aims

The Project aimed to develop regional species 'inventories'. These would essentially be regional collations of existing species records. Our aim was to provide regional maps through the NBN Gateway that described the distribution of the 25 species within the region. Again, no new survey was commissioned especially for this purpose.

The situation at the start of the project

Species data, although plentiful has often been under–utilised for a number of reasons:

- lack of access to data;
- inadequate resource allocated to managing species records;
- lack of adequate metadata to enable consistent understanding of its potential use;
- problems with redundant and/or inconsistent data formats;
- lack of clarity about data ownership and use permissions.

At the start of the project there were basic standards for submitting species data to the NBN Gateway. The 'Recorder 2000' software implemented these though none of the partners in the project were using the software already.

The approach taken

Many partners indicated that they would prefer to use their own existing systems for managing species data and that the investment in switching to a new system would be significant and risky. The project therefore focussed on promoting some simple data capture standards that could be implemented through a range of systems.

A guidance document was produced, drawing on the existing NBN data standards but developing them further to meet the partnerships needs for precise data.

Each of the LRCs were contracted to extract all the data they held on each of the 25 species. Other partners were asked to submit species records to the Gateway for this subset of species.

Some National Recording Groups were approached for data, but only those that were partners to the project (Butterfly Conservation, Herpetological Conservation Trust and RSPB) were able to deliver data within the timescale of the project.

Many National Recording Groups were not able to easily meet our data request because the data was not held in an easily accessible electronic format. Data was managed in a range of ways and extracting records for specific species was often difficult (many voluntary recorders manage their records by 'site' rather than species). The project did not have the resources to solve these problems with each data contributor. It therefore focussed on ensuring the partners to the project (in particular the LRCs) were able to submit species records to the species inventories.

The way in which the data was organised was also important for the LRCs. Some submitted a single dataset (encompassing all species records) to the NBN Gateway and administered the data as one dataset. Others submitted individual datasets for each species, presumably because the original sources for the data were different and slightly different access positions had to be implemented for each species.

The project aimed to implement the NBN data exchange principles when defining access positions for these datasets. Specifically, the NBN Trust Access Officer promoted the position of all data being publicly available at 10km resolution, and available at the precision at which records were originally collected for project partners.

Outputs

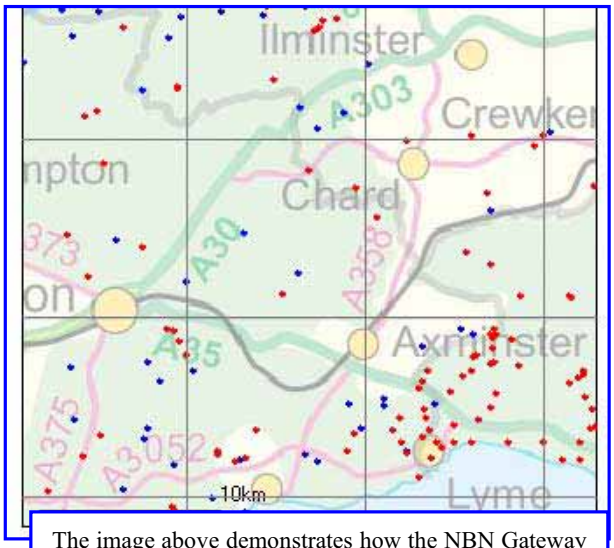
The NBN Gateway now provides access to a greater amount of data for these key species in the South West than for other areas of the UK. There is more information in the South West, due to a coordinated effort to target the species listed above. Table 1.4 indicates the numbers of records submitted during the project. Key points to emerge from this analysis are:

- For some species we were unable to develop inventories within the timescale of the project. In some cases this is because the data did not exist, in others we were unable to get all potential contributors to deliver data to the NBN Gateway – some of these constraints were resource related others were technical.
- The LRCs were able to make a fuller contribution to the inventories because they had previously invested in data custodianship.
- The numbers of records for each species also reflect recorder effort. The birds and mammals are particularly well recorded compared with some of the invertebrates and lower plants.

Table 1.4. Numbers of records submitted for the short-listed species during the course of the project

Common Name	Records submitted by LRCs	Records submitted by others	Total number of records in region
Water vole	1944	627	2571
Hornet robber fly	106	0	106
White clawed crayfish	132	261	393
Nightjar	950	436	1386
Blue ground beetle	5	9	14
Basking shark	11	0	11
Southern damselfly	224	213	437
Bullhead	354	0	354
Cirl bunting	168	410	578
Reed bunting	1035	0	1035
Pink sea fan	0	0	0
Marsh fritillary	1630	103	1733
Tiny fern-moss	0	0	0
Waved carpet moth	141	0	141

Common Name	Records submitted by LRCs	Records submitted by others	Total number of records in region
Pink meadow cap	0	0	0
Brown hare	3527	474	4001
Cranefly	1	0	1
Otter	7241	784	8025
Bastard balm	68	747	815
Dormouse	1145	863	2008
Depressed river mussel	0	0	0
Argent and sable moth	83	0	83
Greater horseshoe bat	501	2665	3166
Shore dock	0	494	494
Greater water parsnip	65	166	231
Great crested newt	1421	1	1422
Totals	**20752**	**8253**	**29005**



The image above demonstrates how the NBN Gateway can provide additional information. The blue dots are records of dormouse from the English Nature Dormouse inventory, the red dots are additional records from local record centre data.

The above picture illustrates the regional dormouse inventory. It shows how a collation of local and national data sources through the NBN Gateway can provide a more complete view of the distribution of species.

Lessons from the work on species inventories	
Positive	National standards can enable collation of data from local and national sources, but there needs to be investment in transferring skills to data contributors and co-ordinating collation exercises.
	LRCs, having invested in ensuring a data management process was in place, suffered few technical constraints to supplying data, although much paper-based data was not accessed.
Negative	Voluntary Recording Groups were often not able to supply the data due to resource constraints and poorly structured data.
	Some LRCs had to renegotiate access positions with their voluntary recorders to make the data accessible via the Gateway. This took time and constrained data accessibility.
Key learning point	**There are few species for which there is only one data source. Collation from a range of sources would significantly improve the content of most species inventories.**

Demonstration and evaluation

Once the inventory products were available to the project's partners and others the project was keen to encourage active evaluation and use of the mobilised data. We did this in several ways:

- a consultant was appointed to provide technical support to users in using the NBN Gateway and organising evaluation studies;
- the LRCs each promoted the mobilised data as part of their wider range of services to local users;
- the English Nature Project Officer promoted use of the NBN Gateway within English Nature;
- Defra ran a funded project to evaluate the use of the data.

The outputs of this work were captured in a range of ways including reports, workshops and meetings with key staff. Part 3 of this report captures some of these findings and Part 4 summarises some key lessons learnt about the process of promoting the NBN with users.

Part 2 Improving biological data management & exchange

Introduction

This section of the report explains how some of the project partners have applied NBN standards within their own organisations or partnerships in order to make existing data more accessible. Some have also looked at how working practices could be improved to maximise the value and accessibility of future data collection. We do not attempt to capture all the activity that the partners undertook during the project. Rather what follows is a series of case studies from different types of data contributor. We hope that relating the experiences of project partners will help others to tackle similar problems. They should not be taken as NBN policy or even agreed best practice as some of these projects have more work to do to develop sustainable solutions.

The following case studies are included here:

Case 1: Co-ordinating Butterfly Recording in Avon.

Case 2: Clarifying data exchange between Butterfly Conservation and Dorset Environmental Records Centre.

Case 3: Dartmoor National Park Grassland Survey – Updating inventories.

Case 4: Clarifying roles and authority to use BSBI data in Cornwall.

Case 5: English Nature adopting NBN standards.

Case 6: English Nature and 'Nature on the Map'.

Case 7: Using inventories to inform local habitat surveillance priorities.

A final summary section captures some of the key themes and lessons arising from this work.

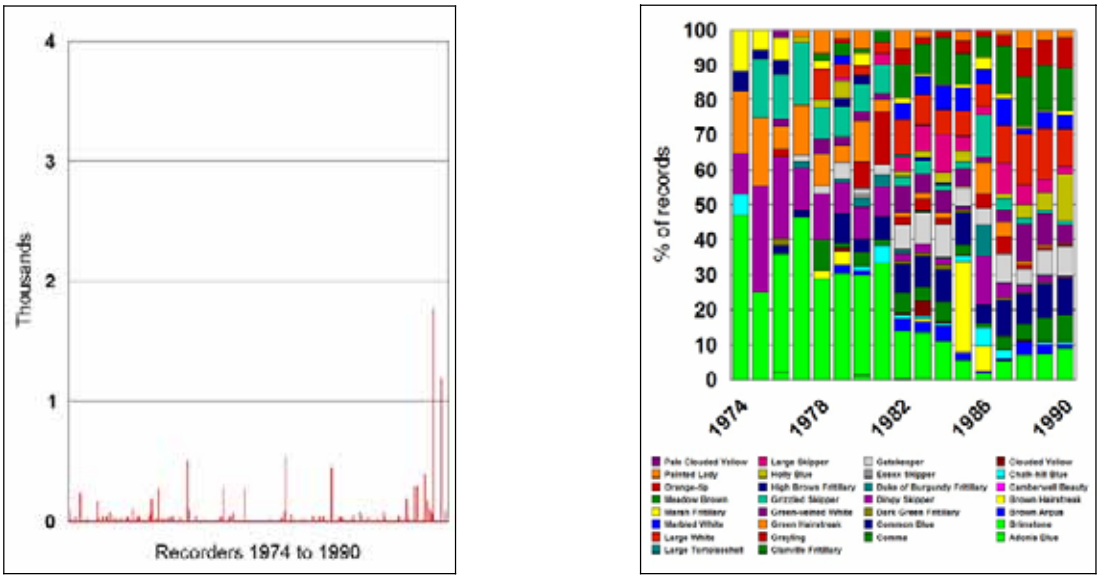
Case 1: Co-ordinating and improving the outputs of voluntary recording: BRERC and the Avon Butterfly Recording Project

Introduction

This work summarises a project initiated by Bristol Regional Environmental Record Centre (BRERC) in early 1990's and is continuing in 2004. Although the SW Pilot did not initiate this work, it does illustrate one example of how Local Record Centres can work with voluntary recorders to increase the quantity and quality of records collected. Other Local Record Centres in the region also provide this type of service to recording groups.

The problem

In the period leading up to 1990 there were relatively few active butterfly recorders in Avon. Of the records that were collated locally, the majority were of common species, in particular the brimstone. BRERC identified that several key species of conservation concern were under recorded in the county and that voluntary recording in Avon needed to be enhanced and focussed on the under-recorded species.



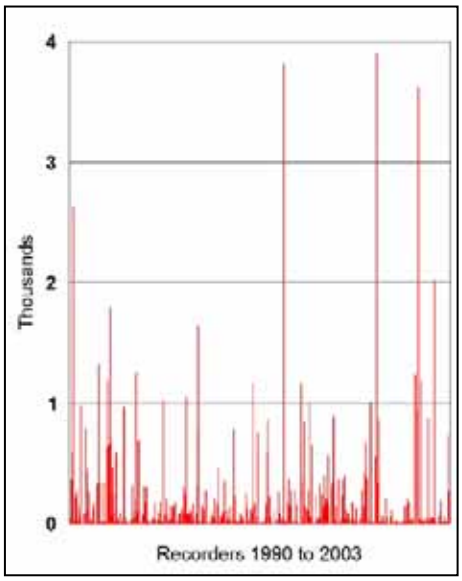
Figured 2.1a & 2.1b. 2.1a – Butterfly recorders in Avon and the number of records they submitted each year 1974-1990. Each column represents one recorder. 2.1b – the proportion of butterfly records taken up by each species. Pale green represents brimstone records and shows that in 1974 just under 50% of all butterfly records consisted of this species.

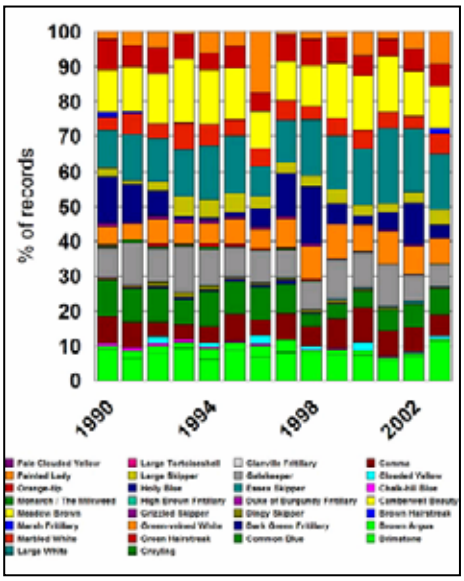
The solution

BRERC set up the Avon Butterfly Project. Its aims were to increase the quantity and quality of butterfly records collected in Avon and widen the range of species recorded to include key species at risk. This would provide a better evidence base for butterfly conservation in the county.

BRERC did the following:

- provided a forum and facilities for the group to meet;
- organised training courses on identification using local butterfly experts;
- collated records and liased with local butterfly experts to verify records;
- liased closely with Butterfly Conservation nationally and regionally to develop the project and in particular to ensure resulting data could be shared and used;
- promoted biological recording with the wider public to increase the number of active recorders;
- published the results as 'Butterflies of the Bristol Region' for public dissemination.





Figures 2.2.a & b. 2.2a – illustrates the increase in number of active recorders and the number of records provided by recorders after 1990. 2.2b – Illustrates the change in the species recorded (eg marsh fritillary is blue – thought to become extinct in the early 1990s but rediscovered in 2003. Red is marbled white and grey is gatekeeper – under-recorded pre 1990, but now consistently recorded). This dataset provides a better representation of the rare and characteristic species in the region.

Benefits

This project has resulted in a better evidence-base for decisions about butterflies in Avon. For example it has enabled BRERC to track the decline of the grayling butterfly in the county since 1990 and identify the key remaining sites that are strongholds. This kind of activity is vital to the efforts of the Avon BAP partnership to recover grayling populations in Avon.

It has developed a strong and lasting partnership with voluntary recorders and done this in ways that benefit both the users of the LRC and Butterfly Conservation nationally. New recorders have been encouraged and trained, which means the data is based on a wider recording community with accompanying improvements in geographic coverage and species recorded. It also means that the future recording of butterflies in Avon is more sustainable.

LRCs can effectively support and encourage local recording networks. Local engagement is crucial to the process.

Constraints

The project generates lots of data, a large proportion of which is entered onto computer by BRERC, as only a small proportion of recorders are motivated to carry this out themselves. This data custodian role is poorly understood by funding bodies and hence is not well resourced. However, this activity is vital to maintain and improve the data services provided to users. They are 'hidden costs' of providing a biological data service. BRERC resources this activity partly through service level agreements where possible, partly through using volunteers as data officers and partly through charging commercial users for data services.

Lessons from the Avon Butterfly Recording Project	
Positive	Win-win partnerships can be established between LRCs and voluntary recorders. The best scale for this is at county-level.
	Appropriate training and support to voluntary recorders can direct effort towards conservation priorities.
	The work of the LRC is highly valued by local recorders. To them the LRC is the NBN.
Negative	Data custodian role of the LRC is undervalued and poorly resourced. Under-resourcing encourages continuation of charging for data access which is counter to NBN policy.
Key learning point	**A properly resourced data custodian providing training and support to voluntary recorders at the local level can direct recording effort towards conservation priorities.**

Case 2: Clarifying data exchange between Butterfly Conservation and Dorset Environmental Records Centre

Introduction

This paper provides a brief summary of a project part-funded by Defra and English Nature that attempted to clarify the authority and permissions associated with butterfly data. The ultimate aim being to identify best practice and hence promote procedures that would enhance access to users of butterfly data. This summary sets out the products and conclusions reached through implementation of data flow modelling, an approach to information management being promoted by the NBN Trust.

Current data flow model

To date, recorders have passed butterfly records to the Butterfly Conservation Dorset branch, to DERC, or both. However, the BC Dorset branch has become the main focus for butterfly recording and data collation. All records received by DERC are passed to the experienced butterfly recorders at the BC branch to ensure that all submitted records are verified and collated into accurate, validated and accessible datasets for each year. The data collated by the BC branch is passed to BC's national office where it is used in regional, national and international contexts, to support conservation, public education and academic research.

BC and its branch volunteers want to maximise the uses to which butterfly data are put in order to promote and support the conservation of butterflies and their habitats. In previous work examining data flows as part of the Wildlife Trusts' 'Linking LRC' Project, the valuable role DERC could play in administering local access to butterfly data was acknowledged by BC and its branch volunteers. The intention was for identical copies of the BC branches annual butterfly datasets to be passed to DERC, as well as to BC's national office. However, to date no data have been passed from the BC branch to DERC.

Proposed data flow model

The NBN Trust has made significant progress in its work to promote and facilitate improvements to data access and quality management. These advances helped encourage BC and DERC to revisit their existing model of data flow, providing an opportunity to practically test NBN models and standards.

The data flow modelling approach helped BC and DERC identify gaps between their current practice and that being promoted by the NBN Trust as 'industry standard'. This was particularly the case in respect of managing authority to pass on and use wildlife records. The supporting documentation developed by BC and DERC as part of this exercise illustrates the progress made towards addressing these gaps in policy and procedure.

The proposed model recognises the BC branch as producing and holding the master copy of the county's butterfly records each year. The branch currently fulfils the majority of data custodianship roles promoted by the NBN Trust. The branch (supported by BC's National Office) will continue to promote and support butterfly recording in the county, circulating recording forms, producing feedback newsletters, organising recorder training events for example. A branch volunteer (selected for their excellent knowledge of the county's

butterflies, ecology and distribution) is responsible for the verification of records received. Branch volunteers then computerise records to form the master Dorset butterfly dataset. The master dataset is updated annually. The BC branch will undertake some new data management functions with support from BC's national office. This will primarily include the production of metadata to the standard being promoted by NBN.

A version controlled copy of the master dataset will be supplied under licence to DERC, who will administer access to butterfly data and provide services to local users, handling enquiries for local data from local authority planning officers, developers and ecological consultants for example. The BC branch will provide additional data interpretation where required. A second version controlled copy of the master dataset will continue to be passed to the national Butterflies for the New Millennium (BNM) database maintained by Butterfly Conservation's national office staff and volunteers to support regional, national and international uses.

The primary function of the licence agreement between BC and DERC is to authorise DERC to administer access to the data by third parties. For maximum clarity, a parallel internal agreement will be drawn up between the BC branch and BC's national office to ensure transparency and build trust between all parties and, importantly, facilitate the identification of current limitations to data flow.

With support from the NBN Trust, BC and DERC have both developed licences to facilitate the robust transfer of authority allowing them to pass on and use the butterfly records they receive. BC and DERC have each developed:

- a data collation licence, an agreement between the original recorder and the collation body (either BC or DERC),
- a data supply and use agreement setting out the terms and conditions under which data is supplied to users.

Additionally both organisations intend to publish formal policies on data access and the use of personal information. These will help clarify their data handling practices and support the licence agreements they hope to implement. Once published BC and DERC intend to contact recorders who have submitted butterfly records in the past to seek their agreement to butterfly records being made available in accordance with these policies.

Data access levels and the NBN Gateway

Both BC and DERC have yet to establish formal policies on data access. Both organisations are in the early stages of evaluating the NBN Gateway as a data delivery tool.

BC (working with the Centre for Ecology and Hydrology) has already made a substantial butterfly data resource available to the public on the NBN Gateway; namely the BNM dataset. BC intends to further facilitate access to its butterfly distribution data in accordance with the seven NBN principles of data exchange, and discussions are ongoing as to how this might be achieved.

DERC is in the early stages of assessing how it might use the NBN Gateway and subsequently has not made any butterfly data available through it. This position is unlikely to

change with the proposed model of data flow unless DERC's key funding users request access via the Gateway.

Butterfly data for Dorset is likely to be made available to users on a case-by-case basis using traditional methods of supply (eg email and CD) supported by the new data supply and use agreements. Both BC and DERC feel unable to make the Dorset butterfly dataset publicly available at full resolution on the NBN Gateway until both organisations secure sustainable funding for their activities. The current fear is that such a move by one partner would undermine any funding support received by the other.

Conclusions

Both BC and DERC feel that the proposed model of data flow represents an efficient, effective and transparent data management system. BC and DERC hope that the model of data flow will provide a template for other BC branches and local records centres. Both organisations have made good progress towards developing and implementing new policies and procedures for butterfly recording and the management of data access and quality issues. The NBN Trusts progress in developing products to manage data access, ownership and custodianship issues has helped BC and DERC greatly in this regard.

The major remaining barrier to access stems from the past and current under-resourcing of biological recording. Whilst many areas of data access and use present little overlap between BC and DERC some uses and user groups may present concern and conflict. Chief amongst these is the accessibility of data to the main institutional users, either directly from BC, DERC or via the NBN Gateway. Since neither organisation is in receipt of sustainable funding for activities undertaken to gather, collate, manage and disseminate butterfly data, there is concern that any move by one partner towards providing wholesale access to such user groups would fundamentally undermine the position of the other and lead to the breakdown of the data flow model. DERC has made some progress towards this end in recent years, developing service level agreements with their major users, but both organisations recognise that without the extensive activities of the other, far less butterfly data would be available for use.

BC and DERC both identify sustainable funding as the major limitation to a dramatic increase in the availability of butterfly data through the NBN Gateway and thus to institutional users at both county and regional/national scales.

Care needs to be taken to prevent replication and overlap of roles at local level. This project has started to clarify roles and develop a working model, though the project is still at an early stage. The relative roles of the BC local branch and DERC and national BC will evolve with time and no doubt will need to be flexible to make use of resources that may become available.

Case 3: Dartmoor National Park Grassland Survey – updating inventories

Introduction

This case study demonstrates how new data can be incorporated into the existing habitat inventories to fill gaps. Dartmoor National Park Authority (DNPA) commissioned a survey of dry, enclosed unimproved grassland within the Dartmoor National Park area. English Nature contributed towards the cost of this survey on condition the survey results would be made openly accessible and in particular to Devon Biodiversity Record Centre (DBRC), to enable them to use the information to update the regional inventory for the UK BAP habitat, Lowland Meadows. The key aims of this were as follows.

- to increase coverage of the lowland meadow inventory;
- to develop survey methodology that allows for integration of the results into habitat inventories;
- to explore the most efficient data flows to enable the above.

Methodology

The detailed methodology can be studied in the full report (http://www.nbn.org.uk/swpilot). There were a number of conditions attached to English Nature's contribution to ensure that our aims were met:

- Survey should be designed so that the results can be interrogated directly to ascertain presence of lowland meadow as defined in the draft mappable habitat definition.
- The resultant survey data should be made available to DBRC for inclusion into the lowland meadow habitat inventory and wider dissemination.

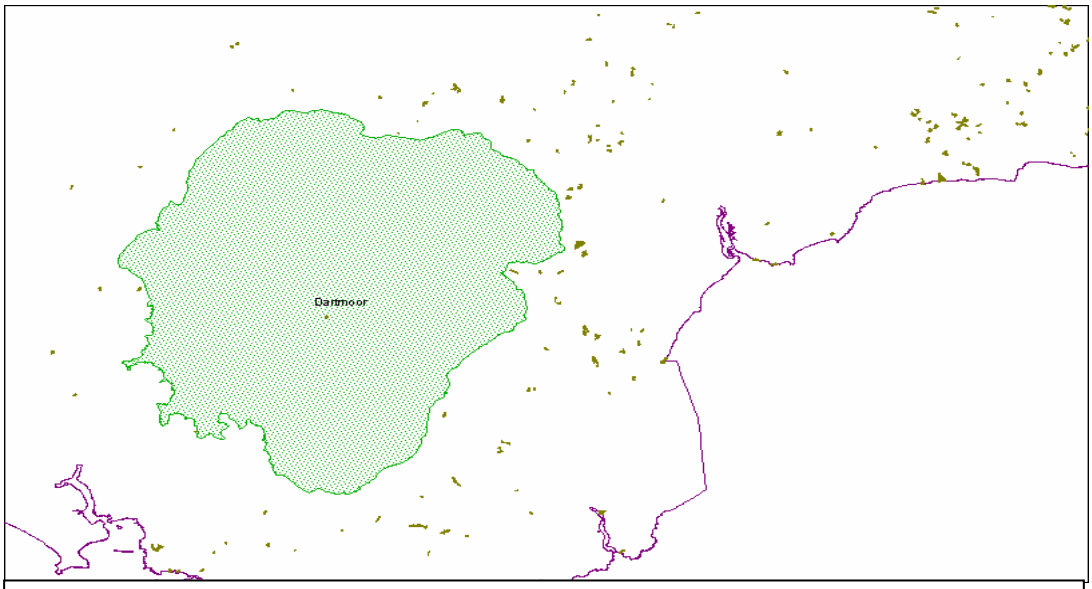


Figure 2.3. The above shows part of Devon with the green shaded area showing the area of Dartmoor National Park. The darker green areas show known extent of lowland meadow. As can be seen there is very little data for the Dartmoor NP area.

Results

The survey, carried out during summer 2003 found a considerable number of sites with unimproved grassland interest. The survey showed that Dartmoor National Park hold a significant amount (262 hectares) of the United Kingdom MG5 crested dog's–tail – black knapweed grassland resource. This information has now been integrated by DBRC into the regional lowland meadow inventory (see figure 2.4).

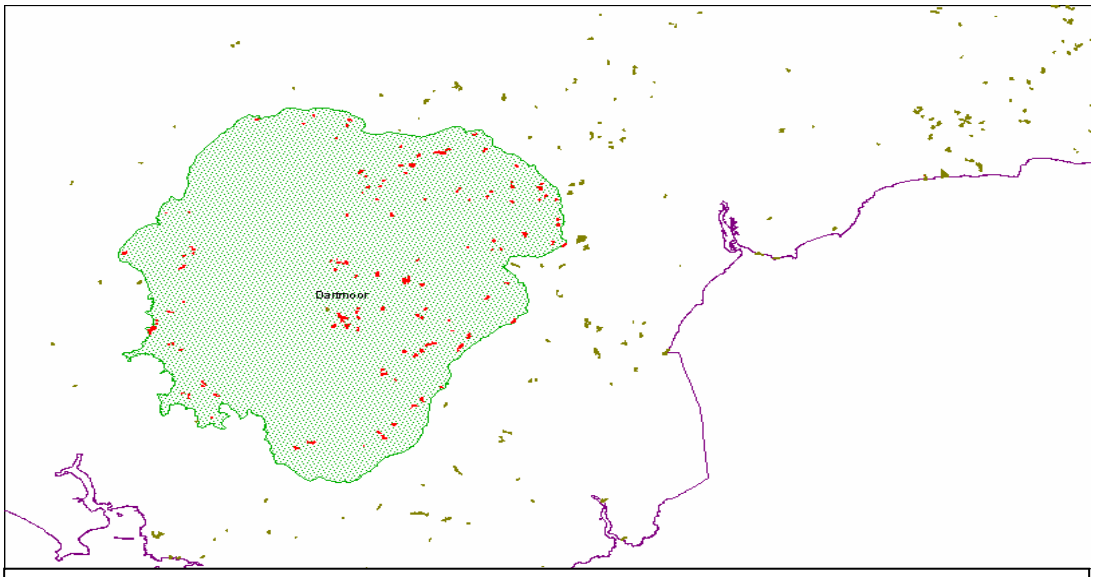


Figure 2.4. The above shows part of the updated lowland meadow inventory. Data sourced from the Dartmoor grassland survey is shaded red.

Key learning points

- With slight adjustments to methodology, new survey can be designed to ensure that the results can be used to improve regional habitat inventories.
- The process can be made easier by ensuring that clear data flows and use agreements are in place prior to survey work beginning.
- By working in partnerships, organisations can make more efficient use of survey resources.
- Use of national standards enables local survey to be placed in a wider context and used for other purposes

Norman Baldock, the DNPA Ecologist said:

> "The Grassland Survey, which looked at Lowland Meadow sites throughout the National Park, has been very successful at filling the last major gap in our knowledge of Dartmoor habitats. The development of the survey methodology in conjunction with the local NBN Project Officer, greatly increased the efficiency of recording and in particular, the speed of incorporation into the National Inventory".

Case 4: Clarifying roles and authority to use BSBI data in Cornwall

Introduction

One of the key reasons why data collected locally by voluntary recorders is not more widely accessible is that there can be lack of clarity over roles of local and national bodies in managing the data, often accompanied by lack of clarity over who has authority to define data exchange policy. This study undertaken by the Environmental Records Centre for Cornwall and Isles of Scilly (ERCCIS) and Botanical Society of the British Isles (BSBI) provides one example of how these problems can be tackled.

Background

A considerable amount of botanical recording occurs in Cornwall. There are a core group of active voluntary recorders and several additional sources of botanical records (eg survey work undertaken by the statutory agencies and local authorities). However, the data generated by this activity was not easily accessible to decision-makers for the following reasons:

- there was no formal agreement between the BSBI Vice-county recorders and the LRC which services most of the key decision-makers in Cornwall;
- there was no agreed process for collating data into a single plant data repository and hence several plant datasets were developed;
- some summarised data was passed on to BSBI national representatives for atlas production, but this did not meet all BSBI's or other national users' needs;
- there was lack of clarity over who had authority to define data exchange policy.

Aims

- To improve access to data collected by BSBI recorders locally and nationally.
- To develop a cost-effective and clear process for managing botanical records in Cornwall.

Approach

English Nature supported ERCCIS to undertake the following:

- document existing data flows and exchange agreements at the local level between ERCCIS and plant recorders;
- evaluate the management of data access and quality and investigate if and how data flow arrangements could be improved;
- provide a clear, efficient and effective example of best practice for the management of data at the local level by plant recorders and an LRC.

In order to achieve these aims ERCCIS undertook the following tasks:

- documented existing data flow with key plant recorders;
- established formal agreements between key plant recorders and ERCCIS;
- discussed and agreed protocols for exchanging data locally between BSBI VC recorders and ERCCIS and revised mechanisms of data flow, including links to NBN gateway and BSBI nationally;
- clarified role and relationship between local BSBI, national BSBI and ERCCIS and formalised this into an agreement.

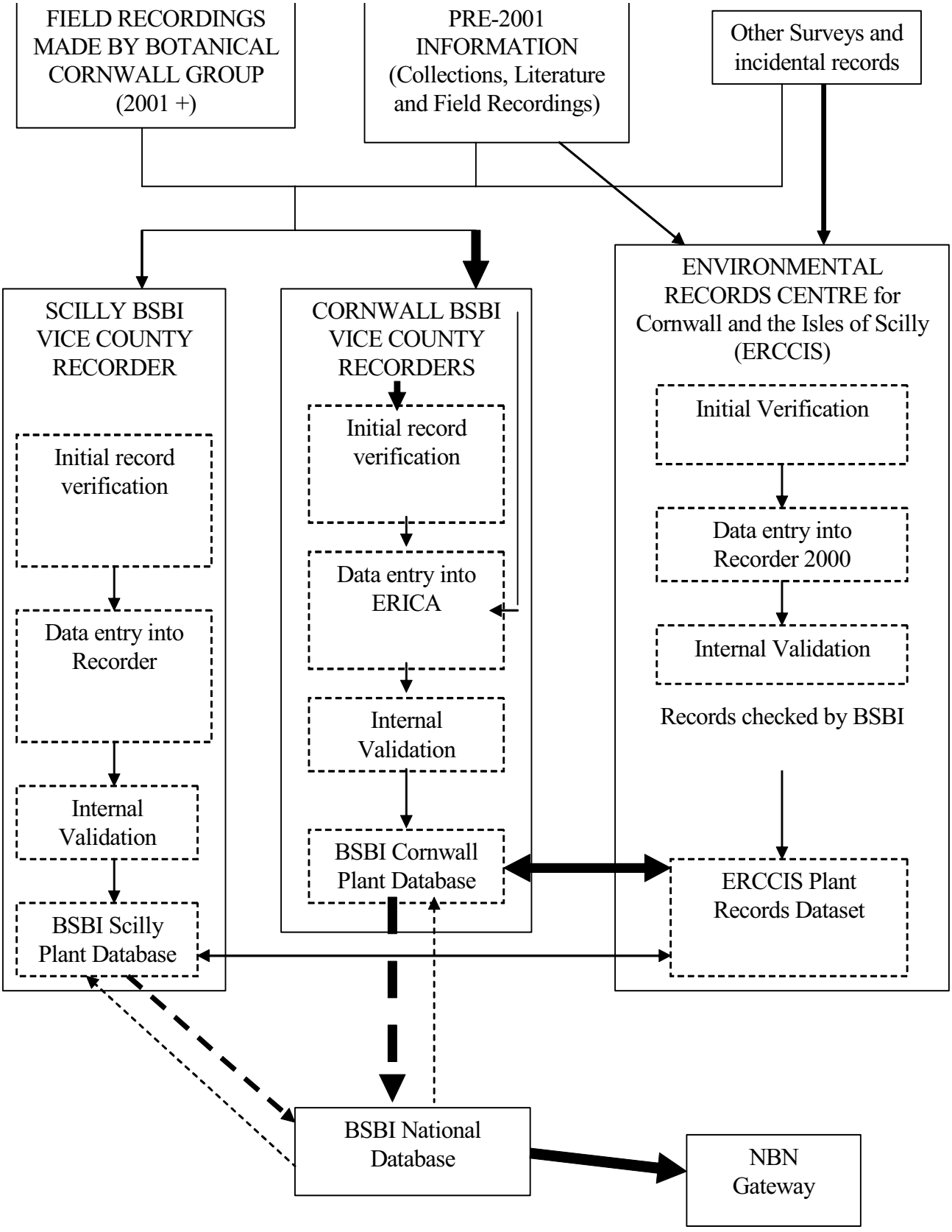


Figure 2.5. Data flow diagram: Plant records for Cornwall and the Isles of Scilly – as agreed on 14 January 2003 by BSBI and ERCCIS. Thickness of arrows indicates volume of data.

Key Points:

- BSBI VC recorders will be the main custodians of the Cornwall and Isles of Scilly Plant database, taking a lead on verification of records and managing the database
- ERCCIS will support their role by collating and supplying records from other sources, providing data capture services where necessary, software support and technical advice. ERCCIS will also co-ordinate and support the activities of the Cornwall Botanical Recording Group
- ERCCIS will be provided with a copy of the master database and take a lead on data dissemination data to decision-makers within the county
- BSBI nationally will be provided with an extract of the Cornwall database and will be responsible for collating this with other counties and loading the data onto the NBN gateway and agreeing data exchange policy

Benefits

This project has laid a foundation for improved accessibility and use of botanical data both within Cornwall and nationally. This will be piloted and developed further.

Constraints

The maintenance of an up-to-date Botanical Database for Cornwall depends on a partnership between ERCCIS and the BSBI locally. Essentially the BSBI data custodian input is dependent on the goodwill of a small group of volunteers. The ability of ERCCIS to underpin their activities is dependent on its funding partners seeing the value of such activity. This is often not the case and LRC resources for voluntary recording support are always under pressure.

Lessons learnt from the ERCCIS/BSBI project	
Positive	The successful completion of the project dependent on a foundation of trust between the two parties and a common aim to improve access and use of botanical data
	Voluntary recorders were happy to make their data more accessible as long as formal agreements were in place. These need to be kept as simple as possible.
	The NBNT agreements have proved useful if kept simple and applied with pragmatism and flexibility.
Negative	The local partnership is risky as it depends on the support of the LRC and the input of a small number of key BSBI VC recorders. Any reduction in input on either side would adversely affect the quality and quantity of data accessible.
	Data custodianship as defined in this study looks complex and potentially inefficient. Three custodians have been defined locally as well as the need for a national custodian role for BSBI.
	National BSBI has very little capacity to collate and validate data, develop access policy and engage with the NBN gateway. This may constrain access to data for national users.
Key learning point	**Whilst the improved clarity of roles is helpful data flow would be compromised seriously if either partner lost the input of the key people involved. Efficiency and simplicity should be a key factor when developing custodianship services.**

Case 5: English Nature Adopting NBN standards

Introduction

English Nature has a responsibility to make its data and information publicly available in accordance with the Environmental Information Regulations, Freedom of Information Act and to deliver the Modernising and Open Government Agendas. There are also benefits in sharing data externally in order to further delivery of its objectives (most of which are delivered by partnerships of one sort or another).

The NBN provides a framework for doing this, in particular a set of standards and tools for enhancing access to biological data.

Background

English Nature invests ca. £1m/annum in new survey work and has a significant amount of historical information on biodiversity. Unfortunately much of this information has not been managed or updated, so that it quickly becomes lost or redundant once it has fulfilled its initial purpose. Data is not proactively shared within the organisation so that it is difficult for datasets to be used for other purposes. Data collected locally is often not shared with national staff and vice versa. There is no national index of datasets. There are no formal corporate standards for collecting and capturing biodiversity survey data.

This report outlines work English Nature has undertaken to improve access and use of existing biodiversity data by developing standards and guidance, using the NBN data standards wherever appropriate.

Approach

English Nature undertook a national project to put in place a framework for managing biodiversity data that would enable it to enhance access and use of existing data and maximise the benefits of future investment in survey.

Most of English Nature's investment in survey is through contractors or partners and this was where effort was focussed.

The following key tasks were undertaken:

- Mobilisation of a number of key national datasets to better understand the issues and constraints to implementing NBN standards (including national bat, dormouse and grassland datasets and the Invertebrate Site register).
- Adoption of the NBN data exchange principles and integration of these into new survey contracts.
- Development of a set of survey standards for habitats and species.
- Development of a strategy for adoption of Recorder 2000 internally and through contractors, and the establishment of a support contract for technical services.
- Development of a data custodianship strategy. This is focussed on outsourcing these services wherever possible, as there is very limited internal staff resource for data

custodianship. The ultimate aim is to minimise the lag period between data collection and dissemination through the NBN.

Development of this package of measures is in progress and English Nature expects to implement these standards in September 2004. The main vehicle will be through its contracting standards.

There will be a continuing need to provide technical support to our staff and monitor adoption of the standards and progress in mobilising data through the NBN. A national officer currently has this role and will be able to outsource technical support where necessary. It remains to be seen the extent to which the organisation will be successful in promoting these standards and enhancing access to its biodiversity data.

Benefits

The benefits to adopting NBN standards are considered to be:

- A cost-effective mechanism and framework for discharging our statutory responsibility with regard to sharing data and information.
- A mechanism by which we can share data and information with partners thereby co-ordinating and maximising delivery of biodiversity on the ground.
- By pooling our existing data with those held by partners we will be in a better position to assess survey gaps and use our survey resources more effectively in the future.
- English Nature recognises that collation of existing data is the first step towards developing inventories for key habitats and species. The NBN gateway provides a mechanism to carry out this collation at a national level.

Lessons learnt from the English Nature Standards project	
Positive	Real progress was only possible on this work because English Nature dedicated staff resource to it.
	Learning by doing was a useful approach and helped flush out issues that could not be foreseen.
Negative	English Nature is a large organisation where a significant amount of new survey is commissioned by Area Teams. Implementing standards consistently will be a challenge and require regular review and ongoing support.
	There is no clear data acquisition strategy. Ideally this should be linked to a Monitoring and Surveillance Strategy for wildlife on designated sites and in the wider environment.
Key learning point	**Large investment in biological data is under utilised and significant cost-savings could be realised if existing data was shared more widely internally.**

Case 6: English Nature – Nature on the Map

Introduction

This section outlines the development of the 'Nature on the Map' component of English Nature's Nature On-line project specifically making the BAP priority habitat inventories available via the Internet and the development of a tailored 'Advanced Map' tool specifically aimed at biodiversity professionals that integrates data from a range of sources including the NBN.

Aims

One of the overall objectives of the South West Pilot was to demonstrate to all partners the benefit of the National Biodiversity Network in facilitating delivery of targets and other nature conservation policy objectives. One of the key needs raised by English Nature's Area Team staff at the start of the project was the need to view a range of different types of information together for a given area. This work, delivered through English Nature's Nature On-line project aimed to develop and test prototypes of data supply to our Area teams and their partners.

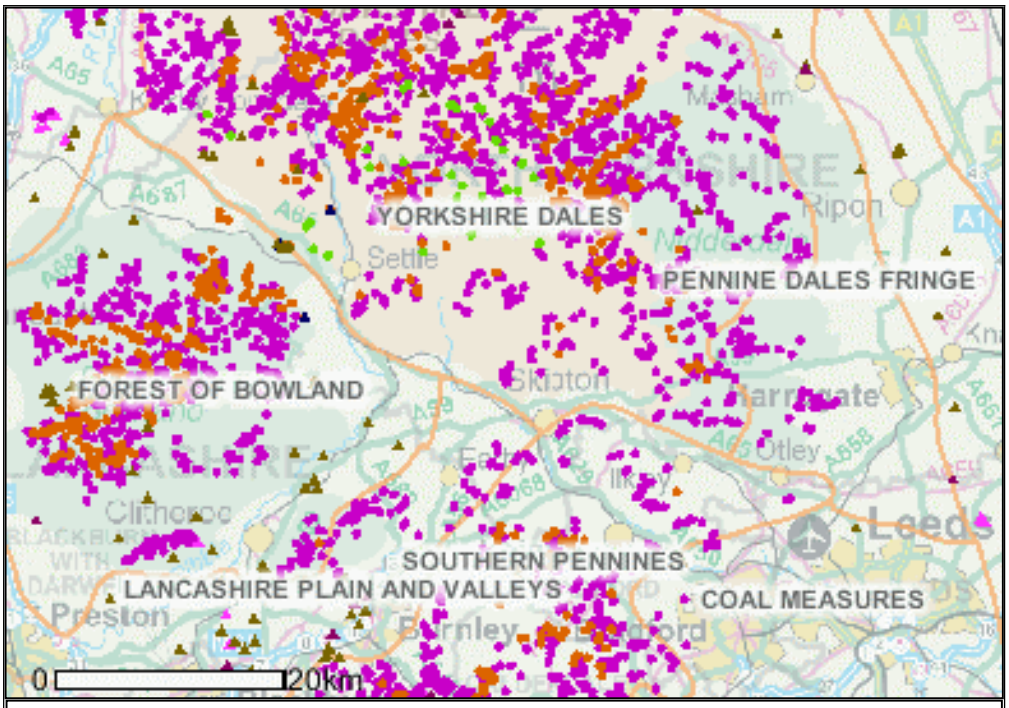
Our approach

Our approach was to provide an internet-based tool for disseminating the BAP priority habitat inventories where they could be interpreted in the context of other relevant information. At the beginning of the SW pilot project the NBN Gateway Team were asked to develop a mechanism for displaying and reporting habitat inventories. Whilst this functionality was developed, it became increasingly clear that the NBN gateway would be going through a major redevelopment and several competing demands meant that the maintenance and development of the habitat reporting functionality could be compromised.

Coincidentally, English Nature's Nature On-line project was developing a web-based mapping service called 'Nature on the Map' (NotM). This service (http://www.natureonthemap.org.uk/) presented a lower risk mechanism for delivering the inventories and it was therefore used as the primary host for the habitat inventories. As part of the Nature On-line project, national BAP priority habitat inventories for the UK were prepared using the methodology developed in the South West Pilot project.

Nature on the Map

The basic functionality of NotM would enable all 23 national habitat inventories (and two undetermined layers) to be displayed on a map. The map is interactive and can be viewed at a specific area from England-wide to individual field scale with base Ordnance Survey maps at the relevant scale.



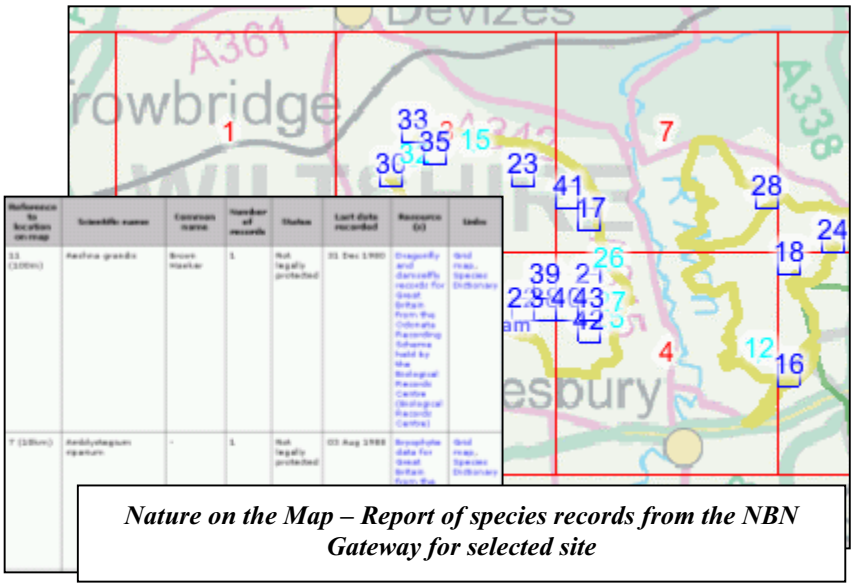
Nature on the Map – BAP priority habitat inventories

For each habitat parcel from the inventories a series of attributes are accessible. These include priority habitat, quality of determination and the sources of the data. A habitat definition and metadata are provided as well as a link to the UKBAP action plan for the particular habitat.

The advanced map

In order to enhance the interpretation of the BAP habitat data, access to additional relevant data was provided through an 'Advanced Map' function. This is explicitly targeted at biodiversity professionals. NotM provides thematic maps on designated sites and geological features. The service was provided enabling users to customise their maps by selecting which layers to display from administrative boundaries, land classifications and designated sites.

The Advanced Map also enables thematic maps to be produced for a BAP priority habitat. Using this facility, the importance of a selected area such as districts or land classification units can be ranked for a particular habitat. A dynamic link is provided to the NBN Gateway enabling a list of the species recorded for a particular habitat parcel, designated site etc. to be retrieved. Links are provided to specific information on the status of designated sites and to other sources of data, such as the Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk).



Nature on the Map – Report of species records from the NBN Gateway for selected site

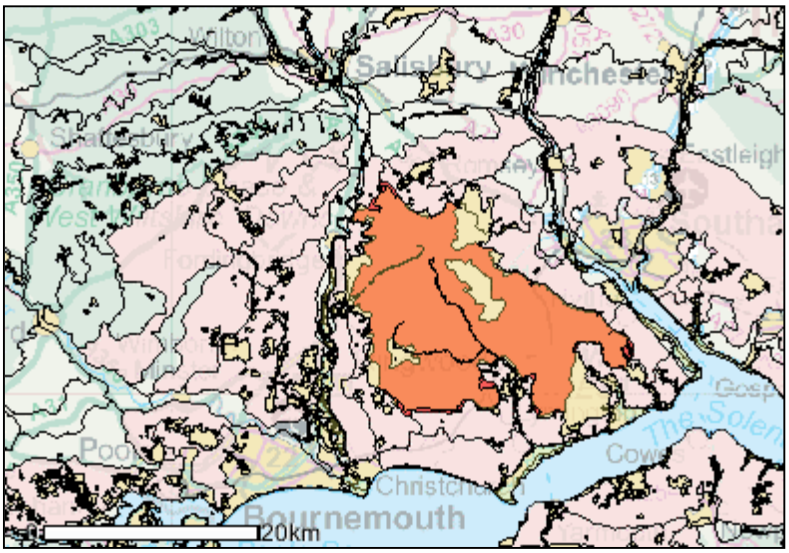
The habitat inventories will also be available as GIS layers that can be downloaded across the Internet. The habitat inventories may also be hosted on other services such as the NBN Gateway and MAGIC.

How successful were we?

The initial version of Nature on the Map including the first habitat inventories was released in December 2003. The remaining habitat inventories are being loaded as they completed up to the end of March 2004. The Advanced Map facility has been implemented and is undergoing testing and user feedback prior to its formal release.

Early responses to the habitat inventory data available through Nature on the Map have been very positive. They substantially increase the information available on the status of habitats outside of designated sites and provide the first nationally available dataset on which to target wider countryside action to deliver Habitat Action Plan targets.

Concerns have been expressed over the quality of some of the data. The habitat inventories were seen as a first draft, starting from a base of no equivalent national dataset. The work in the South West should demonstrate the important role of LRCs in the development, quality control and updating of habitat inventories. By making the habitat inventories accessible through Nature on the Map we hope to encourage significant feedback and interest in the further improvement of the inventories.



Nature on the Map – Percentage of lowland heathland per landscape description unit

The thematic mapping has, as yet, received less positive responses. Whilst the value of using products, such as Landscape Description Units, is seen useful as a biodiversity planning framework there is concern about the proliferation of such products confusing rather than helping biodiversity decision makers. Also there was concern over providing such products in the public domain since thematic maps can easily lead to misinterpretation. We see products such as this as somewhat experimental and will review their usefulness in light of feedback.

Providing access to species information from the NBN Gateway through Nature on the Map was well received by Area Team staff. Once a number of important datasets are available in the next couple of months – vascular plants, bats, butterflies, moths, dragonflies and birds – the Gateway should be a viable tool. The strength of accessing species data from Nature on the Map is that data can be retrieved directly for designated sites by selecting them from a map. We aim to extend this functionality to enable querying for any other area displayed on the map including habitat parcels, administrative areas, natural areas and landscape description units. It is also possible to query only the species groups that are of interest eg mammals, birds, invertebrates etc. to search by date and to filter on 'important species'.

What have we learnt?

Issue: Proliferation of data services and confusion of users

There are a confusing number of Internet based data services apparently offering similar information. This is often because data services are developed on behalf of individual organisations, and there is an unwillingness to share data. This potentially means replication of IT development time, which can be inefficient. More importantly, unless simple advice can be provided to users about the best route to information then the risk is that data will not be used.

Solutions

We chose to build on an existing development rather than produce yet another product. The NBN Gateway provides a generalist service for the location of biodiversity records (particularly species).

Nature on the Map was already being developed as a source of a range of data on designated sites. We chose to expand the scope of NotM to simplify access for users and save development resources. By developing the functionality on English Nature's site we also reduced the demands on the NBN gateway team. A seamless link to the NBN gateway was developed within the NotM service. This meant we were able to benefit from the existing NBN service rather than developing this element of the functionality ourselves.

The target audience of the habitat inventories was primarily biodiversity professionals. The professionals were defined as planners, conservation officers and regulators. Another important audience is the general public, those looking for more information about their natural environment and local sites of wildlife interest.

The two components of the site were separated with that aimed at 'biodiversity professionals' contained in the Advanced Map option. We intend to have a period of promoting the tools with users for specific applications and will be reviewing the products in light of this feedback.

Issue: Reliability

For a public facing service, it needs to provide a high level of reliability and robustness and be available 24 hours a day and be delivered on time.

Whilst improved reliability is one of the primary objectives of the current redevelopment of the NBN Gateway, it is a partnership project with conflicting requirements. There is a risk that development of the user interface or functionality may take priority over reliability or compromise it.

Solutions

One of the reasons for using Nature on the Map rather than the NBN Gateway was that we would have more control over the development of the project. By not using the NBN Gateway directly we have reduced the risks from the Gateway not being developed to the same timescale impacting on the outputs of the South West Pilot. There remains however a need to ensure that the link to the NBN gateway is robust and viable. This has not been the case during the South West project. A formal agreement will be developed between English Nature and the partners responsible for the NBN gateway to clarify the standards expected and ensure adequate resource is given to maintain the service.

Issue: Data quality

The inventories available through Nature on the Map are a first attempt at collating national BAP priority habitat data. There is a risk that potential users of the data will be discouraged by errors in these datasets.

Solutions

The expectations of users needs to be managed in respect of the quality of the data ie that the habitat inventories are a first draft and a considerable improvement on previously available data. We therefore need to be open about the quality of the data. We have provided a mechanism for feedback via the website so that users of the data can help verify data and contribute to improving the quality of the datasets.

Lessons learnt from the Nature on the Map project	
Positive	The Nature on the Map development and particularly the Advance Map component had a clearly defined target audience and was delivering integrated products to assist them in making better-informed decisions relating to biodiversity.
Negative	Because of the untried nature of the products being made available through Nature on the Map there is a risk of misunderstanding or misinterpretation by a mass audience.
	Aiming one tool at both the general public and biodiversity specialist's risks failing to meet the needs of either audience.
	The NBN gateway has limited resources and is faced with conflicting demands and this compromises its ability to deliver a reliable operational service.
Key learning point	**Information systems need to be focused clearly on a specific audience providing interpreted information relevant to that audience.**
	Inter-operation between systems should be favoured over competition.

Case 7: Using inventories to inform local habitat surveillance priorities

Introduction

This section explores how inventories could be used to identify data gaps and hence target surveillance resources more effectively. It describes work undertaken by Bristol Regional Environmental Records Centre and Dorset Environmental Record Centre, which used the habitat inventories developed through the pilot. In theory the same approach could be taken for species inventories.

The problem

Currently resources for new field survey are scarce. The cost of surveying has increased, and a detailed NVC survey of a single site can cost in the region of £2000-3000. At a national or regional scale the costs of regularly surveying all priority habitats is prohibitive. Elsewhere in this report we outline the range of sources that will be needed to update the inventories, including survey conducted for other purposes through development control and feedback on use of the inventories from land managers and advisors.

There is a role for targeted survey to update inventories, particularly where field survey is the only way of determining the type and quality of particular habitats (eg lowland grassland). This project addresses how to use inventories to determine where new survey might be best targeted to update the inventories.

Our approach

During the initial stages of development of the habitat inventories, information on relevant survey data and other data sets that could be used to identify areas of the priority habitat was collated. This same data was then used to develop the inventories. An important feature of the habitat inventories is that details of the original data sources are recorded in the attribute data for each polygon. Once a new version of an inventory is available, it is possible to use this attribute information to review the age and compatibility of contributory data sets, and to identify sites for which new or more detailed survey work is urgently required.
Two factors that affect the reliability of contributory data sources in identifying areas of priority habitats are the age of the data, and the classification system used. For example, an area of priority habitat can be identified with a higher level of certainty using NVC data that is less than five years old, rather than Phase 1 data that is more than five years old.
Polygons within each inventory were therefore assessed to determine:

- The percentage area of each habitat within each determination category for which the primary data source was less than or more than five years old.
- The percentage area of each habitat within each determination category that was derived from NVC (detailed information) or Phase 1 (less detailed information), or from aerial photos alone (not ground-truthed).

Table 2.1. Number of polygons within each habitat inventory type in Dorset (woodlands, grasslands and coastal) categorized by habitat determination. Source data categorized by age and classification type.

		Woodlands	Grasslands and heath	Coastal
	No. of polygons	1276	1830	181
Determination	Definitely is	32.2	30.2	53.3
	Probably	52.3	56.3	9.6
	Definitely present	15.5	11.7	37.2
	Not present but close	0.0	1.8	0.0
Age of Source Data	< 5 years old	15.8	39.5	90.4
	> 5 years old	84.2	60.5	9.6
Source Classification	BAP habitat	0.0	0.0	36.8
	NVC	10.6	49.1	20.6
	Phase1 or equivalent	83.2	48.8	42.6
	Aerial photos only	6.3	2.1	0.0

Summary

- The relatively low level of confidence in determination of grassland and woodlands (ca. 30% in 'definitely is' category).
- This uncertainty relates to the large proportion of the inventories based of old Phase 1 data. The age of the data, combined with the 'broader' classification of the survey mean that the data are not a good source for determining BAP priority habitat type.
- Woodlands and grassland never surveyed by BAP type. Coastal habitats have been subject of a more recent BAP priority habitat survey and provide a better determination of the habitats. (90% of polygons definitely have Coastal priority habitat present).
- Age of source data is the key determinant of the accuracy of the inventories.

This analysis has been compared with the survey priorities already identified by the LRC and LBAP partnership. In the case of woodlands, although the inventory analysis would suggest they should be a priority, the partnership has identified them as low priority as they are relatively stable habitats and are not considered to be at risk in the county. Therefore this illustrates that there are multiple factors influencing priorities for survey and this analysis should inform decisions but not necessarily drive them. Other factors such as such as risk of habitat loss and opportunity need to be considered. These decisions may often be best taken locally.

Benefits

The attributes attached to the inventories enable users to assess whether the information is fit-for-purpose. Uncertainty associated with the inventories is largely associated with age and

classification of the source data. Improving the certainty associated with the existing inventories should one of the drivers for future habitat survey. This survey information needs to be combined with other information sources, including more informal feedback from users of the inventories, especially where they have the opportunity to ground-truth the inventories through site visits.

The analysis conducted here can inform priorities for future survey. However, given the resource constraints associated with new survey and with the wider BAP process, it is likely that issues such as nature conservation risk and opportunity are likely to drive new survey as much as need.

Constraints

One of the key constraints to targeting survey effort is lack of a shared understanding of the information that is currently available. By making the inventories available via the NBN we hope to develop a better shared understanding of the information that does exist and the key gaps. This will maximise the potential for gaps to be filled rather than new survey being commissioned where data already exists. This will lead to more efficient survey programmes. Our aim for the future is that the NBN will provide a mechanism whereby any organisation identifying a need for habitat information could quickly assess what is currently available and identify gaps. Where new survey is commissioned we would aim to ensure the resulting data was accessible via the NBN. This will lead to a more informed new survey programme and hence a greater likelihood of maintaining the best possible inventories nationally.

Lessons from the local habitat surveillance priorities project	
Positive	The inventories provide a basis for targeting new survey.
	Sharing the data widely through the NBN will foster a shared understanding of the inventory and hence a wider understanding of the key gaps in the data.
Negative	New survey inevitably is driven by individual organisational needs, opportunity and conservation risk. This may result in survey not consistent with the gaps that exist.
	It is unlikely that resources will ever be available to ensure the inventories are 100% accurate. Our focus should therefore be on collating existing information and survey of inventory sites so that we can quantify uncertainty associated with the inventories.
Key learning point	**The South West inventories provide the best statement about the current information available on BAP priority habitats. Their ongoing utility is dependent on integrating recent survey information as part of the update process**.

Summary

The key messages arising from this work are:

- Sharing existing data opens up opportunities to maximise best use of new survey resources.
- Custodianship is poorly resourced across the board. If we are to fill this gap we must keep ensure future working models are efficient, simple and have the ownership of all key data suppliers and users.
- Voluntary recording effort can be focussed on nature conservation priorities and fill gaps if they have access to adequate data custodianship services. This could include ongoing sample assessment to monitor SAP progress and outcomes.
- Mechanisms of data dissemination need to be clearly focussed on specific audiences and ensure they meet these needs. This applies to the NBN gateway as much as any other web service or the services provided by LRCs.
- Clarifying data exchange and the roles and authority of different players in the data flow chain is key to maximising the value of existing data collection to a wide range of users. Currently this activity is under-resourced and undervalued by users.

Further detail on the specific lessons learnt from the case studies in relation to NBN Standards and Tools, the NBN Gateway and habitat inventories are provided in Part 4.

Part 3: Putting the NBN to Work: Demonstrating and evaluating use

Introduction

This section documents the experiences of some of the partners and user groups engaged in the project. The key aims of these studies were to:

- focus on specific user applications and demonstrate/evaluate how improved access to biodiversity data can improve decision-making;
- provide an evidence-base for development of business cases for future investment in biodiversity data and hence provide a foundation on which to build longer-term data sharing and funding partnerships.

This section uses a series of case studies to illustrate best practice and capture some generic messages. Again, we hope that by documenting the experiences of partners we will encourage others to explore the benefits of the data themselves.

The section is broken down by users or user groups, with the number of case studies for each indicated:

- English Nature (5)
- Defra (1)
- Local Biodiversity Partnerships (2)
- Local Authorities (1)
- Others (a short summary of ongoing activities by other partners, not completed in time to be captured in this report)

These sections are grouped according to the lead organisation conducting the study. In many cases the project work was conducted in partnership and involved several partners (eg the Culm Grassland Project is led by English Nature but involved Defra RDS and the South West Forest partnership).

Local Record Centres are not considered ‘users’ in the context of this section of the report. In several cases they are referred to in the studies as they have been integral to delivering information.

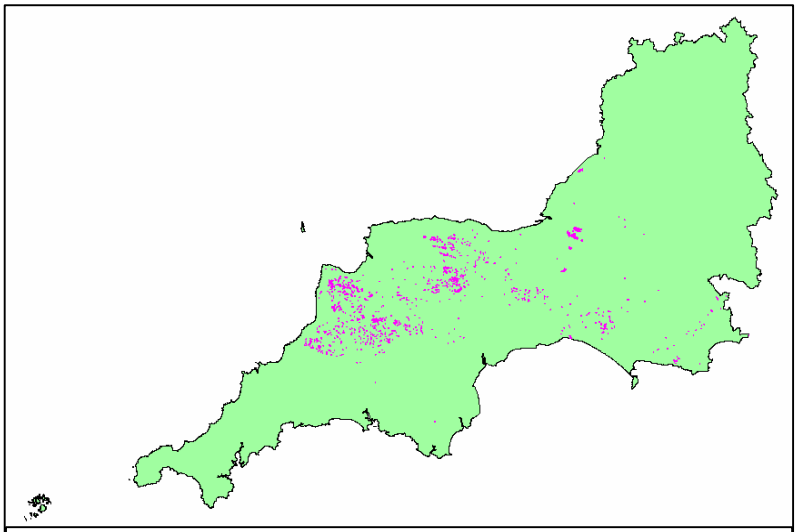
English Nature Devon Team - the use of BAP habitat inventories to influence land use planning in North Devon and Cornwall

Introduction

Culm natural area (dark green)

The area of North Devon and Cornwall represented by the Culm Natural Area is of international importance for its purple moor grass and rush pasture (a UK BAP priority habitat), which in association with a number of other habitats such as fen, grassland, woodland and wet heathland is normally referred to as culm grassland (or Rhôs Pasture). This habitat occurs largely on poorly drained, slightly acidic soils.

This habitat is important for a range of species including the plants wavy St. John's-wort, whorled caraway, a wide range of invertebrates including narrow-bordered bee hawkmoth and a number of bird species, including curlew. The Culm area is of particularly importance for the declining marsh fritillary butterfly, which is a European protected species. About 90% of Culm grassland has been lost over the last 100 years, largely through agricultural improvement and to a lesser extent afforestation.



Distribution of purple moor grass and rush pasture in south west England (from NBN SW Pilot data)

In 1989 to 1991 a Culm Grassland Survey was undertaken to provide a detailed inventory of this diminishing resource. This data was then used by South West LRCs in conjunction with more recent aerial photography and additional survey data to produce a regional inventory of purple moor grass and rush pasture for the South West as part of the NBN project.

Planning future land use

The remaining areas of culm grassland consist of a large number of sites of varying size and quality. Some sites are designated as Sites of Special Scientific Interest, National Nature Reserves or County Wildlife Sites. Others have no formal designation and hence have limited protection. The dual conservation aims for culm grassland can be broadly described below:

- Protection of the existing resource and associated features through positive management.
- Seeking opportunities to re-create culm grassland on suitable sites, especially where this buffers, extends or links existing sites.

Marsh fritillary
Eurodryas aurinia

Current knowledge on the population dynamics of marsh fritillary suggest that larger sites and linked networks of sites, together with correct site management will be vital if species recovery is to be achieved. Knowledge of the current distribution of the habitat as well as identifying new areas for restoration and re-creation of the habitat will be essential if the species is to be conserved. This case study illustrates how a shared data resource can act as a catalyst for partnership working, enabling a coordinated approach to species recovery on the ground. The key mechanism for securing appropriate land management is the Countryside Stewardship Scheme.

The partners

English Nature

As the statutory conservation agency, English Nature has responsibility for designated sites, including SSSIs, cSACs and NNRs. English Nature works with partners to deliver the objectives of the UK BAP, including those for marsh fritillary and purple moor grass and rush pasture. English Nature also supports conservation management on or adjacent to designated sites through its Wildlife Enhancement Scheme grants.

South West Forest

South West Forest is an independent, non-commercial partnership providing a service that is agreed and paid for by its funding partners. Enhanced grants available in the South West Forest area have helped to establish 500 hectares of new woodlands each year since 1998, in ways intended to stimulate and support farm businesses and rural incomes. The Forest area covers 300,000 ha with a population of 180,000 and is broadly bounded by Bodmin Moor, Dartmoor and Exmoor. The aim is to increase tree cover to 15% from the current level of 10% by encouragement and financial support. This would mean 15,000 ha planted over the next 30 years.

DEFRA Rural Development Service (RDS)

DEFRA RDS administers the delivery of Agri-Environment payments to landowners through Countryside Stewardship and Environmentally Sensitive Area payment schemes.

The problem

South West Forest were keen to ensure that any new woodland planting should not negatively impact existing culm grassland or compromise attempts to restore or re-create it. They were keen to ensure that they made best use of all available information. Working with partners, including English Nature, the South West Forest developed a GIS tool to improve the information and quality of advice given to farmers and landowners considering woodland creation. They had access to the existing (1991) Culm Grassland Inventory. English Nature became concerned that there was potential for inappropriate new woodland planting that, although not on existing culm grassland sites, may limit opportunities for expanding, buffering or recreating the culm grassland resource in the future. Defra RDS were already making a considerable investment in sustainable land use through Agri-Environment payment, but did not have full access to habitat inventory information and were keen to develop a more evidence-based approach.

It became apparent that a shared understanding of where culm grassland expansion would best be targeted was required. There have been a number of projects looking at developing methodologies for targeting restoration efforts, but there was a pressing need to make a practical tool available immediately.

Our approach

Matt Low, Assistant Conservation Officer with English Nature Devon, undertook some GIS analysis using the following data sources.

- Purple moor grass and rush pasture habitat inventory
- Digital soil data
- Digital aerial photographs
- Sites under current Countryside Stewardship agreement.
- Ordnance Survey base mapping.
- Species data (including data from Devon Biodiversity Record Centre)

The objectives of the using the above data was to provide an understanding of the likely areas of the Culm Natural Area that may be more suitable for Culm grassland restoration and to provide a shared frame of reference for English Nature, DEFRA RDS and South West Forest. Although in the early stages, this approach is already proving useful. Matt has attended several site visits to culm grassland landowners with officers from DEFRA RDS and South West Forest. The inventory data has enabled better understanding of the management options available, and how a number of different support schemes could work synergistically to achieve greater benefits on the ground for conservation and the landowner.

David Rickwood**,** Rural Development Forestry Advisor for South West Forest said of the project

> "Working with English Nature has helped the South West Forest develop the biodiversity advice offered to those wishing to create new woodland and to more clearly define where woodland may be inappropriate."

Lessons from the English Nature Culm grassland study	
Positive	The provision of high quality habitat data to partner organisations can be influential in achieving a shared understanding of strategic objectives.
	Committing English Nature staff resources to data use delivers real benefits.
Negative	There is still a lot of work needed to increase our understanding of the science of habitat recreation in the Culm.
	The success of this approach is reliant on a continued investment by partner organisations in improving data quality.
Key learning point	Evidence-based advice is persuasive.

English Nature Devon Team – using data from voluntary recorders to improve the conservation status of greater horseshoe bats

Introduction

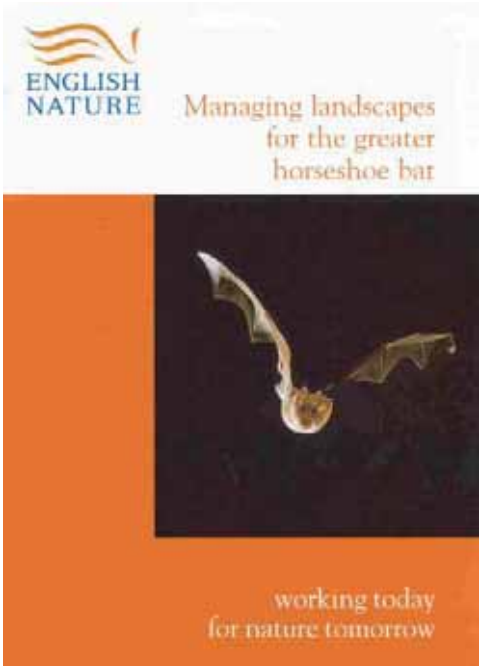
This project has run in the Devon Team for the length of the pilot project and provides a good example of how biological records collected by volunteers can target landscape scale land management to deliver species conservation.

The problem

The Greater Horseshoe Bat is one of Europe's rarest bats and South West England has some of the largest individual populations in Europe. Several of the South West England populations had been declining over the last 10 years.

Information on these bat populations is almost entirely dependent on the recording activities by local bat groups who regularly assess population sizes. This data enabled English Nature to identify important roosts and notify them as Special Areas of Conservation and SSSIs. Through this process 52% of the national population of greater horseshoe bats' roosts are protected through SACs and 34% as SSSIs.

Although designating roost sites has helped, there have been continued declines. These were associated with changes in land management outside the designated sites. The bats typically forage for insects over an area of 4km radius from the roosts and prefers a landscape of grazed grassland, hedges and scrub. These habitats were being lost around the designated sites through intensification of agricultural management practices, resulting in a reduced food supply for the species.



The solution

Therefore the English Nature Devon Team initiated a project to manage landscapes to support the bat populations, with two key aims:

- To support existing SAC and SSSI populations and help secure favourable conservation status of the species.
- To deliver English Nature's commitments under the Greater Horseshoe Bat Species Action Plan.

Data on roosts was collated from local recording groups and captured electronically by the Devon Local Record Centre.

The strategy was to target landowners within a 4km radius of key bat roosts in the South Devon area and promote Countryside Stewardship Agreements as a mechanism to encourage reversion to grassland, favourable hedgerow management and tree planting.

The project was promoted with DEFRA, RSPB, FWAG and Forestry Commission – and all were given the roosts data and asked to contact English Nature if relevant landowners came to them for advice. English Nature offered free advice and proactively targeted important landowners who could secure foraging habitat for the bats.

Local bat recording groups monitored the outcomes of the project and enabled progress in reversing declines to be assessed. Results were presented to meetings of local landowners who were involved in the initiative. These meetings showed that the landowners were interested in the outcomes and the project had fostered greater ownership of wildlife issues.

Outputs

Since the project started, over 600ha of grassland foraging areas have been secured, 60km of field margins created and 100km of hedgerows planted or renovated. This has resulted in stabilising the greater horseshoe bat populations in South Devon. The SACs designated for these species are now in favourable or recovering condition and a major contribution has been made to the delivery of the national Species Action Plan objectives for this species. It has acted as a springboard for similar projects elsewhere.

Benefits

The project could not have achieved the outcomes it did without the long-term support of the bat recording groups. Without the records collected by volunteers:

- The importance of the South Devon area in supporting this European protected species would not have been realised
- Sites would not have been selected and notified as SACs and SSSIs
- The declines in the species would not have been detected and spurred English Nature into conducting more detailed radio-tracking research into the declines
- The proactive targeting of land management schemes would not have been efficient or effective at reversing the declines

Constraints

In order to monitor trends in the species and secure its long-term future more investment is required in ensuring that the recording community is appropriately co-ordinated and has access to adequate data custodianship services.

Lessons from the Devon Bat Project	
Positive	Data sourced from volunteers underpinned English Nature's decisions throughout the project
	Sharing the data with a wide range of partners was fundamental to the project's success
Negative	Mechanisms for keeping the data updated and hence securing the long-term benefits of the project are at risk through lack of sustained investment in data custodianship for the data.
Key learning point	Relatively small investments in data provision and promotion by English Nature enabled them to deliver significant species conservation gains by influencing the activities of others

English Nature South West Regional Policy Officer - using the NBN to influence Regional plans and policies

Introduction

English Nature and its partners increasingly need to influence regional plans and policy to ensure adequate provision is made for protecting and enhancing biodiversity. The data delivered by the project has been used by English Nature regional staff to communicate biodiversity priorities to decision makers in a tailored way. This has ensured that biodiversity issues are properly considered at policy-making level.

The problem

To be effective in influencing regional policy, English Nature's Regional Policy Officers (RPOs) need information on the priorities for biodiversity, their current state and distribution and trends. The paucity of data in these areas available to our Regional Policy Officers is a real constraint – biodiversity is a poor relation to other sectors in this regard. Beyond our information on designated sites, the officers do not have a good evidence-base for identifying and reviewing priorities. They cannot 'map' the existing biodiversity resource and hence direct activity at local levels, so even if appropriate policies exist, implementation can be inconsistent and untargeted. This project set out to use the new data mobilised by the project to fill these gaps.

The Solution

English Nature regional staff initiated a project through the Regional Biodiversity partnership to develop a South West Region 'Nature map'. The products were based on the habitat inventories and species data held by the LRCs. The products comprised:

The **South West 'Nature Map'** (Figure 3.1) describes the distribution and abundance of semi-natural habitats and key species within Landscape Description Units (a subdivision of Countryside Character Areas). Orange areas are areas of high biodiversity value with potential for enhancement and expansion. Areas in green also require action but are where the existing resource is more fragmented and dispersed.

The **habitat inventories** are being used to target activity locally towards conserving and restoring existing known habitat (Figure 3.2).

Tailored products for specific audiences. The inventories can also be packaged to meet the audience needs – for example much of the Regional Spatial Strategy is directed at district scale and the product in Figure 3.3 is appropriate to that audience.

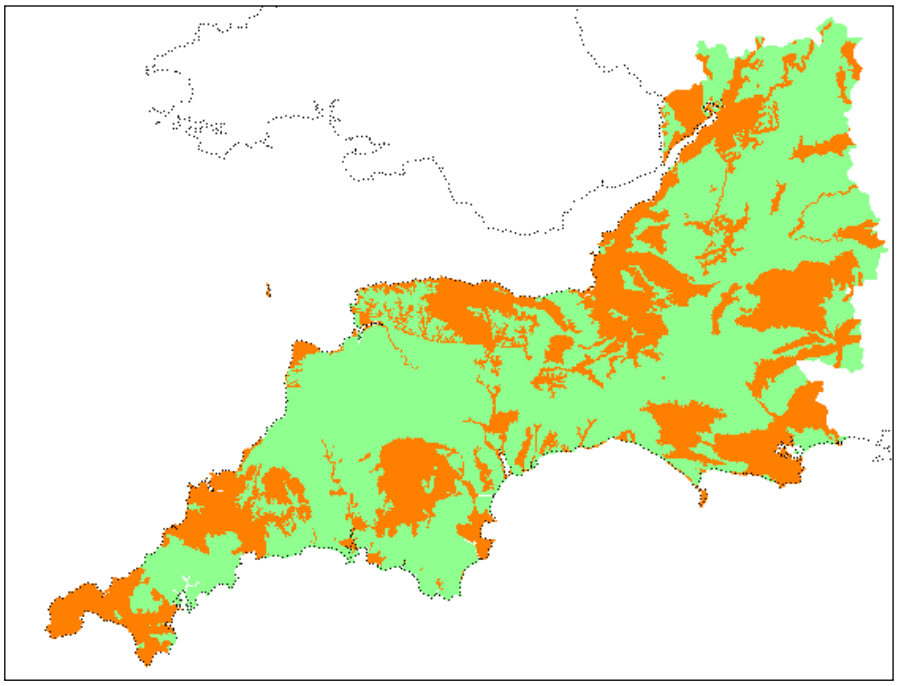


Figure 3.1. The SW Regional Biodiversity Partnerships' - 'Nature map'

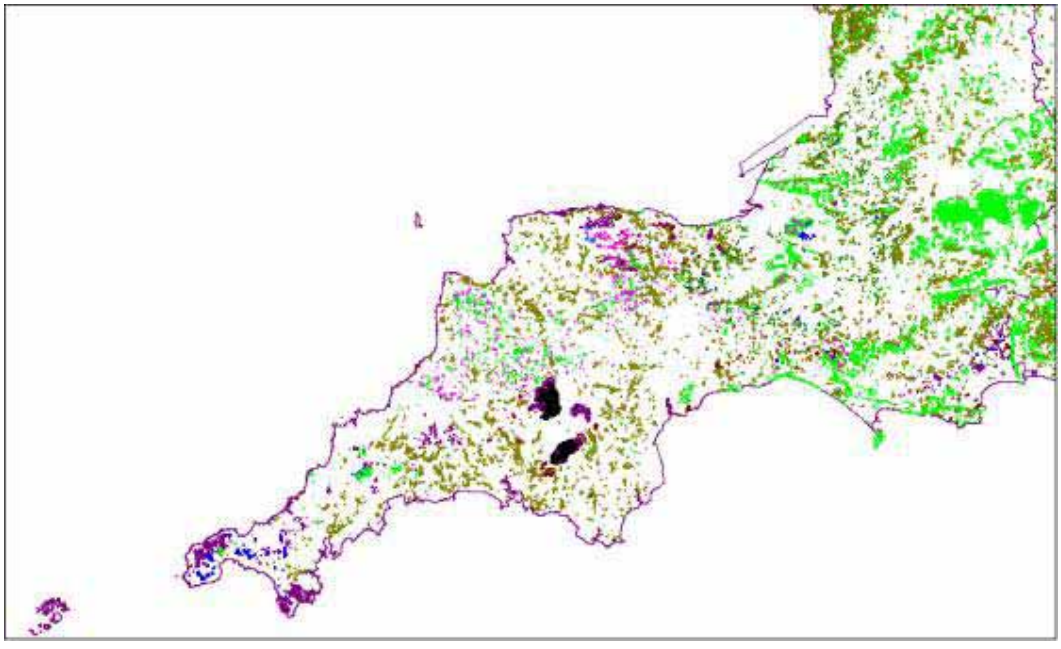


Figure 3.2. The regional habitat inventories at land parcel scale.

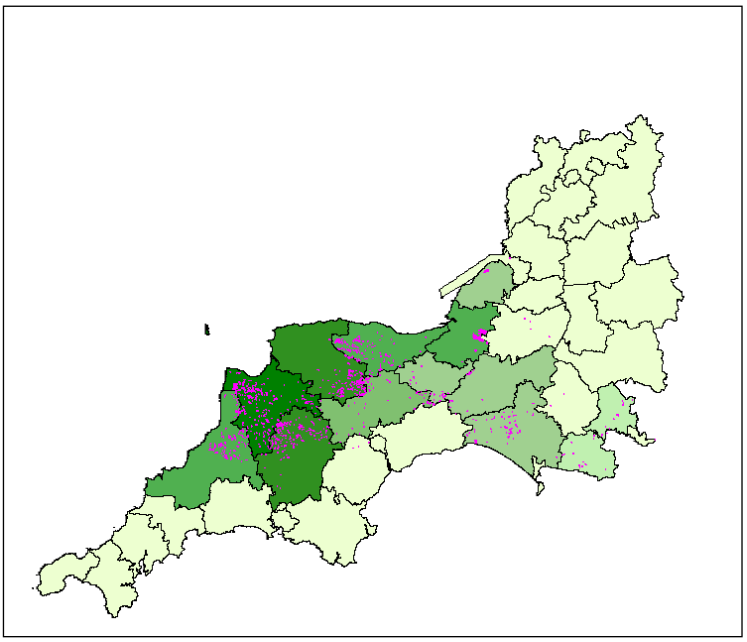


Figure 3.3. A district scale map showing the relative abundance of purple moor grass and rush pasture in each district. The habitat inventory (in purple) is also shown.

These products will eventually be delivered through the Regional Observatory website alongside information developed by other sectors. We aim to develop this range of products to include regional reports on trends in key habitats and species.

Benefits

These products have only recently been produced. From early evaluation of the data and preliminary presentations of the data to a range of regional audiences the following benefits have been realised:

- The 'Nature Map' helps focus large scale biodiversity initiatives in areas most suitable for enhancement. Common ownership of this map across the partnership will help co-ordinate action and make best use of existing resources.
- We can now present the information in a way that fits with the audiences needs, this helps communicate our agenda and influence others.
- The detailed land parcel scale information contained within the inventories is critically important to direct and target activities. Biodiversity policies are of little value unless they can be effectively implemented on the ground.
- The longer-term benefits lie in developing greater integration of biodiversity information with that of other sectors. Sustainable development plans and policies need to take a holistic view and integrated information provision is a key tool to enable development of such plans.

Constraints

These products would not have been developed in the South West without the input of a dedicated project officer. In other regions the English Nature Regional Policy Officer is unlikely to have the time or skills to devote to developing similar products. Without skilled staff resource working to deliver similar products in other regions and keep them updated, similar benefits are unlikely to be realised elsewhere. Regional BAP Co-ordinators may be able to take on some elements of the role.

Beyond the national surveillance datasets that exist for birds, and the information available for SSSIs, there are no data available at regional level to detect trends or assess the impact of regional policies. The project has established a baseline against which habitat outcomes in the region could be monitored. The ability to monitor outcomes is a key requirement of regional policies. If the nature conservation sector is unable to deliver this evidence then biodiversity policies will lose credibility and ultimately struggle to secure sustainable funding.

In the Southwest region a partnership is developing between the Regional Observatory and English Nature to maintain the momentum created by the previous project officer (a Fixed Term appointment that has ended). A regional information officer will be established within the Regional Observatory Environment Module based at the Environment Agency. We hope to have someone in post by January 2005.

Lessons from the project on regional products	
Positive	Tailored regional products can improve our ability to influence policy with regional partners.
	Land parcel scale information is vital to effective policy implementation
	The inventories provide a baseline against which the outcomes of regional policies can be measured.
Negative	Staff resource constraints may prevent us from developing and maintaining this service in other regions. Links with the role of BAP co-ordinators need to be clarified.
	The ability of the biodiversity sector to provide monitoring evidence is still very limited, but the inventories in the South West provide the first baseline.
Key learning point	A small suite of regional information products have been developed that are commonly owned by the biodiversity partnership and are a firm basis on which to influence regional policy and monitor outcomes.

South West English Nature Area Team Casework - protected species and designated sites

Introduction

English Nature is a statutory consultee for legally protected species and SSSIs. In particular English Nature has a statutory duty to issue licences and provide advice under the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994. Its role is to issue licences for activities that would otherwise be illegal because they would result in damage to listed species. In addition many Area Teams provide less formal species casework advice for protected species, particularly to planning authorities. This is the key mechanism by which most Area Teams support species conservation outside designated sites.

The casework that this generates can be a major element of English Nature Conservation Officers' day-to-day work. Often a single Conservation Officer in an Area Team is devoted to species licensing and advice. This report describes the kinds of services LRCs currently provide to Area Teams in the South West and evaluates the costs and benefits of the service and proposes how the service should be developed further to improve the cost-effectiveness of English Nature's species casework service in the future.

Aims

The aims of this part of South West Pilot were to examine some of the ways that Local Record Centres currently assist English Nature Area Teams in undertaking their statutory casework duties and to evaluate the costs and benefits of this service.

Current services provided to Area Teams

Planning control

Species casework

Species casework is routinely driven by the planning authorities who decide whether a particular development is likely to have impacts on biodiversity. Even though these judgements may be made by ecologists, they are subjective and often not based on the best available information.

A number of the LRCs in the South West, through their SLAs with English Nature, provide a service of screening planning applications. Wiltshire, Somerset, Cornwall, Devon and Dorset LRCs all provide a planning screening service. This typically involves a regular screen of **all** planning applications for their area and the provision of alert reports to English Nature for those that are relevant to protected species (and designated sites).

A review of these services by Somerset Environmental Record Centre (SERC) and the Somerset Area Team has found that the Area Team were not being consulted on many applications for which their views were relevant, and occasionally not consulted on cases where there was a strong risk of biodiversity impact.

This screening process provides significant opportunity for English Nature to secure species conservation through the planning process. Where the information on species occurrence is not available or an LRC does not exist it is likely that both European and UK protected species and their habitats are being damaged through ignorance.

Given the volume of species casework potentially arriving on Conservation Officers desks, it is important that they are able to select those cases that are high priority.

At a recent workshop at which SW Area Teams discussed the services LRCs and the NBN Gateway can provide, it was felt that:

- The NBN Gateway enabled them to view the local data in a national context and therefore make judgements about which species were priorities for the Area Team.
- Area Teams value the screening service that LRCs can provide because it can be tailored to local circumstances and the Team can define those priorities on which they would wish to take casework.

Once a case is taken on, LRCs can provide a more comprehensive follow-up service to ensure that English Nature's advice is well informed. The example illustrated in Figure 3.4 shows the sort of additional information that an LRC can provide to English Nature staff and others.

Designated sites casework

LRCs also provide planning screening services in relation to designated sites. Again these can be tailored to meet local needs. Nationally, around 15% of SSSI area is unfavourable due to the influence of landscape scale factors outside the site boundary (eg diffuse pollution, water abstraction, drainage). Whilst English Nature should be consulted on operations and

developments outside sites that are likely to affect site condition, this may not occur. The screening service that LRCs can provide enables potentially damaging operations to be highlighted at an early stage which can help to ensure that potential problems can be 'nipped in the bud' and thereby minimise the time spent on cases.

LRCs can provide English Nature staff with regularly updated datasets that enable the coincidence of protected species and designated sites to be mapped. This provides opportunities for the Area Team to maximise delivery of species conservation (including BAP targets) by taking into account these species in their regular designated site casework. This enables Teams to maximise delivery against several biodiversity targets within one site and hence maximises delivery within limited staff time resources.

LRCs also respond to English Nature data requests during SSSI notification work. In order to notify sites information must exist on its current biodiversity value and ideally this should be placed in a national context.

A number of potential improvements to the NBN Gateway were identified by Area Teams and these were fed back to the team developing the Gateway. These included the ability to:

- report on occurrence of species in designated sites by county, region or country;
- produce a thematic distribution map indicating record density and handle negative records;
- define custom lists when searching on species eg searching for invasive species;
- search an administrative areas for the number of records of a species.

Emerging issues

In the future, potentially greater burdens will be placed on English Nature to provide statutory advice on land management operations and plans and policies. LRCs combined with the NBN Gateway could make these services more efficient by conducting the initial screening of applications (using protocols agreed with English Nature) and selecting those that are most significant for attention. LRCs can also present the evidence on which English nature's advice is based. This can be key to influencing decisions. Some of the key drivers include:

- The recently implemented Environmental Impact Assessment Regulations for uncultivated and semi-natural habitat – for some Area Teams provision of information and advice to Defra RDS is becoming a significant task. BAP priority habitats and species specifically covered by the legislation, and hence the inventories delivered by this project, are a key tool to support English Nature's and RDS's advice to landowners.
- The impending implementation of the Strategic Environmental Assessment Regulations – increasingly our staff will be asked to comment on larger scale policies and plans and will need to put local areas in a wider context .

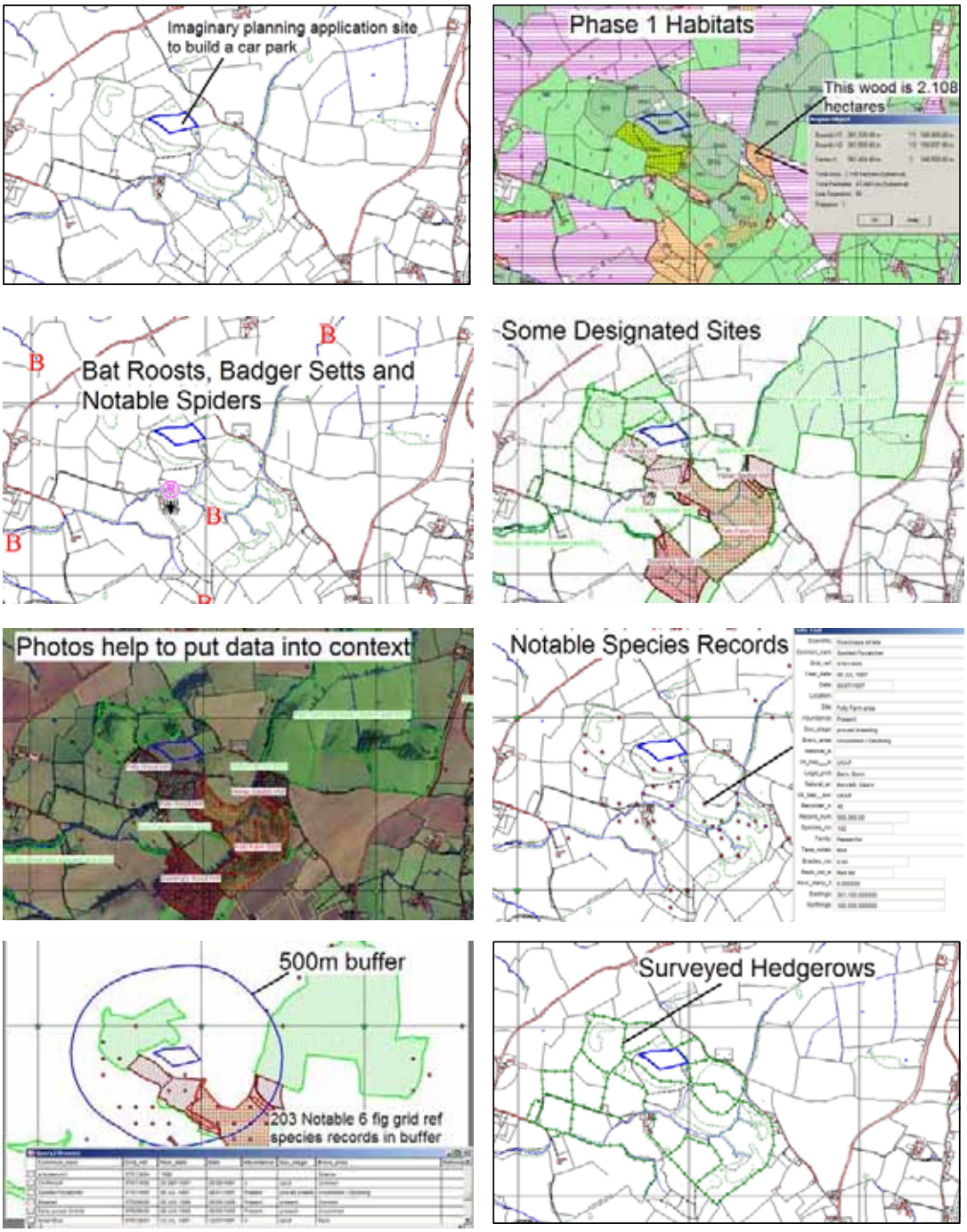


Figure 1. A hypothetical planning application and the range of additional information that can be provided by BRERC to planning consultees.

Benefits

- LRCs deliver a valuable service to Area Teams – advising on local planning applications where biodiversity may be a material consideration. English Nature's ability to influence new developments, particularly where they impact European and UK legally protected species is entirely dependent on having good information on the current distribution and status of these species.

- LRCs can provide a tailored service to Area Teams that relates to local priorities. This can be important to manage demands on Area Team staff resources. Currently the NBN Gateway cannot provide this kind of custom service.
- LRCs do have the capacity to provide additional contextual information to inform decisions, this can be important when considering mitigation measures.

Constraints

- Where LRCs do not exist or are unable to provide this service the ability of English Nature to deliver species conservation using existing statutory measures is weak. This is compromising our ability to deliver Favourable Conservation Status for European protected species.
- LRCs do not currently draw on information outside their geographical area – this can be important in identifying which species and sites in a local area are high priorities in a national context (eg local endemics).
- English Nature Area Teams do not have sufficient resources to commit to SLAs to derive full benefit from the potential services LRCs could provide.

English Nature alone cannot secure the financial position of any individual LRC and hence the speed with which the LRC can develop a beneficial service to English Nature staff may be affected by the scale of investments by other partners.

Lessons from English Nature Area Team Species Casework study	
Positive	Where LRCs are delivering planning screening services they are highly valued by English Nature Area Teams
	English Nature's ability to deliver its statutory responsibilities for species conservation is largely dependent on having access to locally relevant and precise information on species distribution.
	The customisable screening services that LRCs provide can be used to focus on key local priorities and hence manage species casework workload.
	LRC screening services for designated sites can help identify developments external to sites that may affect site condition.
Negative	The varying stages of LRC development and lack of secure funding means that the service available from LRCs varies across areas.
	LRCs do not actively use the NBN Gateway to put local data in context – this would be a valuable service for English Nature.
	Although viewing the data through the NBN Gateway has clear benefits it relies on the user being able to properly interpret the information and understand its constraints. Follow-up contact with the LRC may still be necessary.
	The delivery of improved data services provides greater opportunity for English Nature to influence planning and other decisions, but often staff resources do not allow these opportunities to be realised.
Key learning point	Both the data and the tailored screening services are required if English Nature is to realise the benefits of the NBN. Adequate staff time needs to be allocated to data use if the organisation is to derive the benefits. LRCs currently provide a good service in this area, but there is potential to automate screening through the NBN Gateway.

LRC services to English Nature Area Teams - information capture, management and dissemination

Introduction

There are a number of existing or impending acts of legislation that require all public bodies (including English Nature) to make their data holdings available.

- Under the Environmental Impact Assessment regulations statutory consultees, including English Nature, are required to provide the developer (on request) with any information in their possession that is likely to be relevant to the preparation of the environmental statement.
- English Nature is expected to provide Defra RDS with information on designated sites and wider countryside habitats under the Environmental Impact Assessment Regulations for uncultivated land.
- The Environmental Information Regulations and Freedom of Information Act require public bodies, such as English Nature, to respond to requests for data that they hold. English Nature has a policy of not charging for this service even though significant staff resource may be required to meet requests.
- The Strategic Environment Assessment Directive requires planning authorities to include environmental considerations in the preparation and adoption of plans.

The services LRCs currently provide

English Nature Area Teams hold a large body of paper-based and electronic information relating to designated sites and the wider countryside. Record centres can also provide a service to English Nature teams in mobilising their data holdings. Some specific examples are provided below:

- Gloucestershire Environmental Data Unit and Devon Biological Records Centres have both undertaken data cataloguing exercises with English Nature Area Teams with a view to making the data more available externally and internally.
- In Cornwall, ERCCIS maintain a system for holding data on designated sites and produce summary information for each site. They provide the basic information on protected species and habitats, which is supplemented by advice from the English Nature office.
- Cornwall also has an agreement whereby the English Nature Area Team can refer any wildlife enquiries to the record centre.
- In Somerset the Record Centre is being contracted by English Nature to electronically capture butterfly records so that locally important sites can be targeted under the new Environmental Stewardship Higher Level Scheme.
- In Devon the Record Centre has been contracted to electronically capture bat roost data which has been used to target Agri-Environment scheme agreements.

The value of LRCs is in their ability to undertake this service for a range of partners, acting as a focal point for local data. This can be a very cost-effective means by which data contributors manage their data and disseminate it as opposed to managing data internally. The following diagram is an example of how this has developed in the Avon area with BRERC as the focal point.

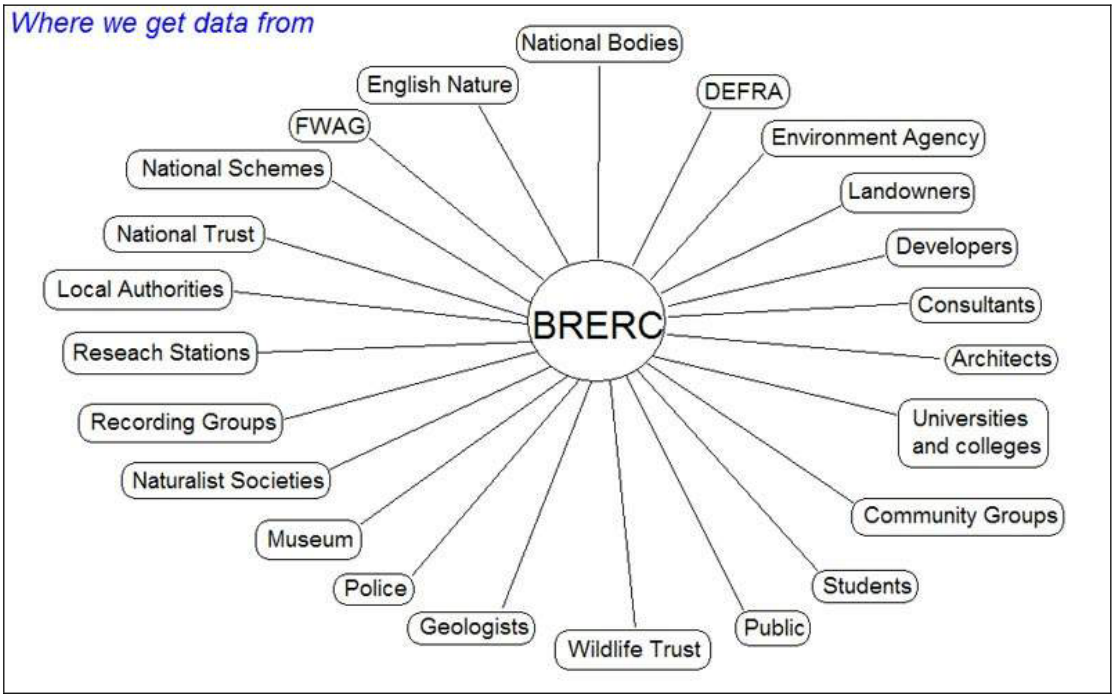


Figure 1. The range of data contributors of Bristol Regional Environmental Record Centre. All contributors are also users of the pooled data resource held at BRERC.

Each of the above data contributors is effectively outsourcing a data custodianship service at BRERC. Some pay for this service others simply supply their data. Data does not pay salary or overhead costs and in order to secure sufficient funds to run the service BRERC requires Service Level Agreements (SLAs) with its main users (in this case Local Authorities, Bristol Museum, English Nature and Environment Agency) supplemented by the income it gets through ad-hoc services for commercial consultants.

Effectively this funding partnership is subsidising the data custodianship costs of the other data contributors, including voluntary recorders. The SLA holders have either a statutory remit or a strong business need for biodiversity data, and it clearly makes economic sense to pool resources and support the data collation and maintenance task in a central service. This investment means that a wide partnership can benefit from the growing body of biodiversity information and the key SLA holders can minimise the amount of new survey they need to commission to meet their business needs. LRCs are essentially the NBN at a local scale – there are many parallels with the way the national initiative is developing.

Benefits

- LRCs provide a cost-effective mechanism for managing and disseminating English Nature's data at local level.
- The LRC provides a central service for access to biodiversity records – this 'one-stop shop' with skilled staff means that access to biodiversity data is rarely a constraint

locally. This means biodiversity is properly taken into account in planning and policy decisions locally.

Constraints

- The data is not routinely disseminated via the NBN Gateway so benefits are only realised within the area of the LRC.
- Some users need to provide underpinning funding to enable the LRCs to function – currently this often short-term and insufficient to maintain a basic service and retain essential skilled staff. Some areas outside the South West do not have LRCs at all.
- Currently the NBN Gateway is perceived to add little value to local users where an established LRC already exists.

Lessons from English Nature's data management and dissemination study	
Positive	Record Centres provide a cost effective mechanism for managing and disseminating data at local level.
	Concentrating specialist biodiversity data management skills in regional 'networks' of LRCs ensures that communities develop and skills are shared.
Negative	Under-funding of current network of LRCs is a key constraint.
	Regional and national bodies cannot rely purely on LRCs to fully meet their needs as the LRCs are not operating as a functional network in most regions.
	Local information currently in LRCs is not routinely shared through the NBN Gateway and hence is not available outside the geographical remit of the LRC.
Key learning point	Record Centres generally work very well for local users but don't meet the full needs of regional or national users across the country.

English Nature National Specialists & Defra - Using habitat inventories as a sampling framework to measure outcomes and report against biodiversity targets

Introduction

This national project illustrates how habitat inventories can be used to define a population of sites that can be sampled periodically to assess trends and identify outcomes associated with UK targets and Agri-Environment schemes. The project was funded through a partnership of English Nature, Defra and JNCC. It is documented here because English Nature's funding for the project came from the allocation for the South West project and because it illustrates a key function of the inventories.

The problem

One of the most significant weaknesses of the UK BAP process is the lack of quantifiable information on the outcomes of nature conservation activities and policy[1]. The only key area of conservation policy that does have a monitoring framework in place is on designated sites. Inability to provide evidence of outcomes in the wider countryside means that we are unable to assess whether current policies and activities are working and whether current spending of public resources on biodiversity is cost-effective. Ultimately this can result in a lack of confidence in the biodiversity sector and potentially reduced resourcing of work programmes in the future. Nature conservation policy is much more target-driven and focussed following the development of the BAP process – we now have to rise to the challenge of monitoring progress against these targets.

One of the key potential functions of inventories is to provide the sampling framework for assessing these outcomes.

The solution

Before the Southwest pilot was initiated a project was run by English Nature to develop a national lowland grassland inventory. This provided a national population of sites that could be used as a baseline for assessing status of the lowland grassland habitats.

A partnership between English Nature, Defra (RDS) and JNCC was established and a project funded to establish a methodology and conduct a survey on a sample of the national inventory outside designated sites. Defra were particularly interested in stratifying the sample further to allow assessment of the condition of sites within and outside Agri-Environment schemes. Therefore, the basic design allowed the following comparisons for each of the 5 lowland grassland priority habitats (shaded area indicates the field survey work undertaken in the project):

[1] Biodiversity Research & Information Group (BRIG) analysis of the information used during the 2002 BAP review Available at (http://www.ukbap.org.uk/Library/BRIG/BRIGSubGroupPapers/2002BrigAssessment.pdf.)

	Agri-Env schemes	
Designated Status	**Within**	**Outside**
SSSI	X	X
Wider Countryside	X	X

The intention was for this survey to form a baseline against which future change could be measured. The survey cost a total of ca. £100k spread over two years and was carried out by contract survey teams.

The project sampled 471 sites, covering lowland meadow, lowland dry acid grassland, lowland calcareous grassland, purple moor grassland and rush pasture and upland hay meadows. Some of the provisional results (reported in detail in a forthcoming ENRR) were:

- 14% of grassland outside designated sites was considered to be in favourable condition – compared with 53% in favourable condition on SSSIs.
- There was a positive effect of Agri-Environment schemes but relatively minor. 19% of sites in AE schemes were favourable compared with 8% outside the schemes.
- The survey collected additional information on vegetation structure and composition as well as management, and so provides good additional evidence on which to base future changes to the schemes.

Benefits

The lowland grassland Habitat Action Plan targets refer to maintaining the extent and condition of existing grassland. For the first time for any of the UK priority habitats English Nature & Defra are able to assess how condition of a habitat nationally is changing. Small changes to the survey methodology could also assess changes in extent and hence enable reporting against all the HAP targets.

The information gained with respect to Agri-Environment schemes has been closely analysed by Defra RDS and is being used to inform the development of the new Environmental Stewardship Higher Level Scheme, including the targeting strategy and the prescriptions available for grasslands. The survey, if repeated could be the main mechanism for monitoring the effects of Agri-Environment schemes on grasslands, and assessing the contribution the schemes make to biodiversity targets.

This survey could also provide the basis for assessing favourable conservation status in the context of the Habitats Directive.

Many aspects of the sampling methodology and statistical analysis for grasslands are transferable to other habitats.

Constraints

The main constraint has been firstly the quality of the information contained within the grassland inventory. Many sites were rejected from the sample as they did not represent the grassland type of interest. This indicates that the information within the original inventory was either absent, inaccurate or out of date. The original grassland inventory was not collected in a standardised manner and the original information not managed and maintained.

The costs worked out at ca. £20k per habitat. This is relatively low given the value of the information collected and its potential to inform improved delivery of nature conservation activities.

Lessons from the National Grassland Monitoring Project	
Positive	Habitat inventory can provide a sampling framework for monitoring outcomes.
	Outcome data can enable effective reporting and improve the delivery and effectiveness of nature conservation activity.
	Much of the methodology developed is transferable to other habitats
Negative	Initial grassland inventory was poorly maintained and hence of limited value as a sampling framework
	Need to incorporate estimates of extent into the survey methodology.
	Cost – although not prohibitive.
Key learning point	If adequately maintained the habitat inventories provide a framework for outcome-based reporting, which is crucial to the delivery of biodiversity targets.

Defra's Rural Development Service - using biodiversity information to support Agri-Environment schemes

Introduction

This case study describes how RDS conducted a business evaluation of the inventory products from the project and the data available from Local Record Centres. RDS has to take account of a number of obligations and policy commitments to conserve biodiversity within its business operations, many of which stem from the UK BAP. Defra's main internal mechanism for delivering the UK BAP are Agri-Environment (AE) schemes.

The problem

RDS perceived the following (quoted from their own Southwest project report):

> "The very limited availability of accurate and reliable data on the distribution of habitats and species represents a constraint on a number of [RDS] business operations, where site specific biodiversity information is critical to ensuring that biodiversity objectives are effectively taken into account. Most significantly it is a constraint in assessing AE scheme applications"…."lack of data also makes it very difficult to measure the potential contribution that existing Agri-Environment agreements are making to biodiversity, which is needed to assess the effectiveness of the schemes".

The solution

RDS took the opportunity of using the Southwest pilot project to explore the potential value of Local Record Centre and other datasets available through the NBN Gateway. RDS provided a detailed information requirement for assessing Agri-Environment scheme applications. Cornwall and Somerset LRCs provided a total of 17 habitat layers and 35,000 species records to RDS for evaluation. These were made accessible via Defra's internal system and also through the NBN Gateway.

The data was evaluated by asking RDS project officers to revisit a sample of AE scheme applications and consider whether the resultant agreements would have benefited from access to the new data and whether decisions would have been different.

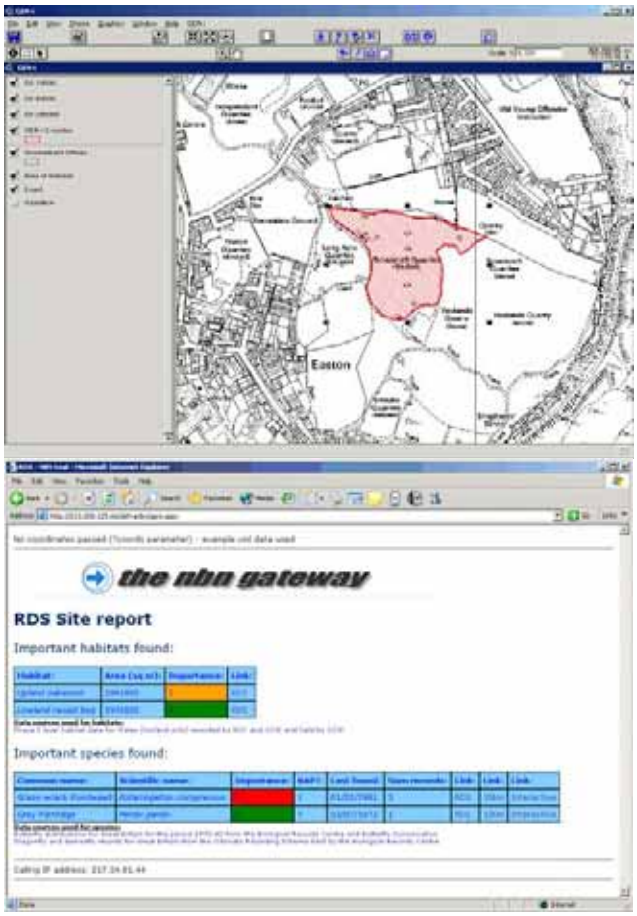


Figure 3. The selection of a an Agri-Environment application area within the Defra RDS GIS system and the tailored report received back from the NBN Gateway.

Benefits

All 9 RDS Project Officers involved in the study found the additional data to be 'useful' or 'very useful'. The following is the answer from one officer when asked "Is this a useful information resource?"

> "Definitely – this extra information would in the majority of cases influence my approach to the visit, making me more aware of extra options I could aim to negotiate/add in. It would make me feel more equipped to fully consider all options"

In over 70% of agreements the additional data added value and improved decision-making. In 50% of agreements the additional data would have resulted in modified prescriptions – often take into account species known to occur on the farm. Specifically the additional data enabled project officers to:

- Often increase the biodiversity score for the agreement and hence increase its chance of funding.
- Identify appropriate options and modify prescriptions to maximise wildlife gain.
- Verify information included as part of the application.
- Prepare project officers so that they could use their site visit time most efficiently.

Project officers preferred to use a tailor-made NBN Gateway report linked to their own internal system rather than the internal system alone. This made the information easier and quicker to interpret (saving time in assessing applications) as well as enabling them to access additional data held on the gateway that wasn't held locally.

Staff in the RDS National Technical Advice Unit felt that the habitat data of the type provided for the trial was of great importance for the schemes as a whole. They conducted an example to assess the contribution AE schemes were making to lowland meadow BAP targets. By combining AE agreement data with the lowland meadow habitat inventory for Somerset they were able to assess that 49% of the Somerset resource was under Countryside Stewardship or ESA management agreements. This was the first time that such a figure has been calculated, and provides a fundamental tool to enable a much more planned and targeted approach to delivery of HAP targets.

Constraints

Local Record Centres provided the vast majority of data used by RDS. This data will not be accessible after the SW Pilot project. Continued access is dependent on Defra reaching an agreement with LRCs that contributes to maintaining the data in the longer term. A national mechanism is needed here as RDS will not want to enter into individual Service Level Agreements with each LRC.

RDS to be sure that records related directly to agreement areas – though knowledge that the species is in the vicinity of the farm is still likely to influence the range of options and prescriptions employed.

Somerset Environmental Record Centre was unable to place its species records on the NBN Gateway within the timescale of the project (the preferred delivery mechanism for Project Officers) because of the need to consult with voluntary recorders who had authority over the data.

Key Learning points

Lessons from the Defra AE scheme trial	
Positive	The data derived from the Local Record Centres clearly improved decision-making and demonstrated the ability to improve the cost-effectiveness of AE schemes.
	The habitat inventory data enabled RDS to quantify the contribution AE schemes make towards achieving HAP targets
	Improved mechanisms for information delivery can make the AE application assessment task more efficient.
Negative	Continued access to the data requires a contribution from Defra towards the costs of running the LRCs and data upkeep.
	Improved policies on transfer of authority would improve access to species data.
	Defra requires a national service, and LRC coverage nationally is patchy.
Key learning point	Improved access to biodiversity data significantly increases the cost effectiveness of AE schemes in delivering biodiversity objectives.

Local Biodiversity Partnerships

Avon and Dorset Biodiversity Partnerships - Geographical targeting and strategic planning of activities

Introduction

This report documents work undertaken by Bristol Regional Environmental Record Centre and Dorset Environmental Record Centre on behalf of their respective LBAP partnerships.

The Problem

After a period of target setting and action planning, most Local BAP partnerships are moving into an implementation phase where partners carry out activities to deliver the targets. The biggest single constraint to LBAPs achieving their targets is lack of resource. This is manifest as difficulties in establishing BAP Co-ordinators at local and regional level and lack of resource to implement LBAP Actions. A more targeted approach, focussed on the sites where actions are most needed or are likely to bring greatest benefits could enable partnerships to deliver more wildlife gain with existing resources.

Our approach

The habitat inventories describe the distribution and abundance of BAP priority habitats, whether they occur on designated sites or in the wider countryside. They therefore provide LBAP partnerships with first opportunity to assess the total resource of each habitat locally and develop more strategic plans to protect and enhance the existing sites through the range of mechanisms open to them.

Both BRERC and DERC undertook similar analyses. Using the habitat inventories as the template they assessed the proportion of each inventory that was under different designations or types of management. The aim being to provide a basis on which to develop much more robust and implementable plans to protect the existing resource.

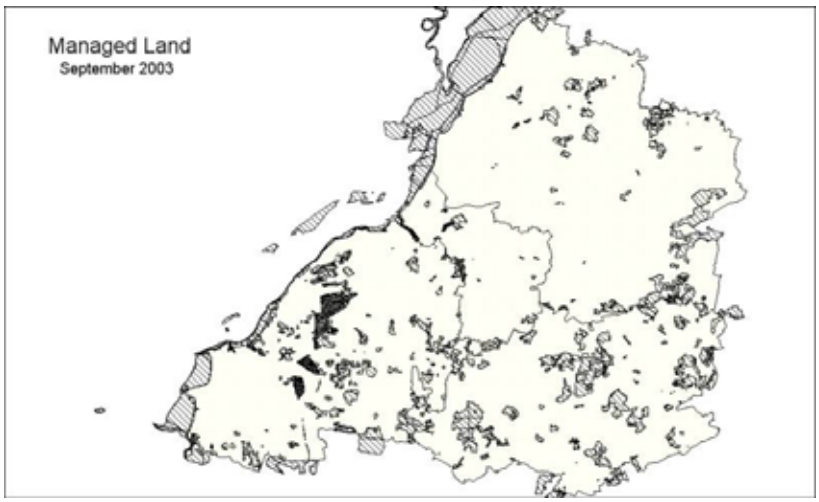


Figure 1. Map of ‘land managed for nature conservation’ within Avon (including LNRs, SSSIs, NNRs, AONBs, RAMSAR, SACs, Wildlife Trust sites, etc).

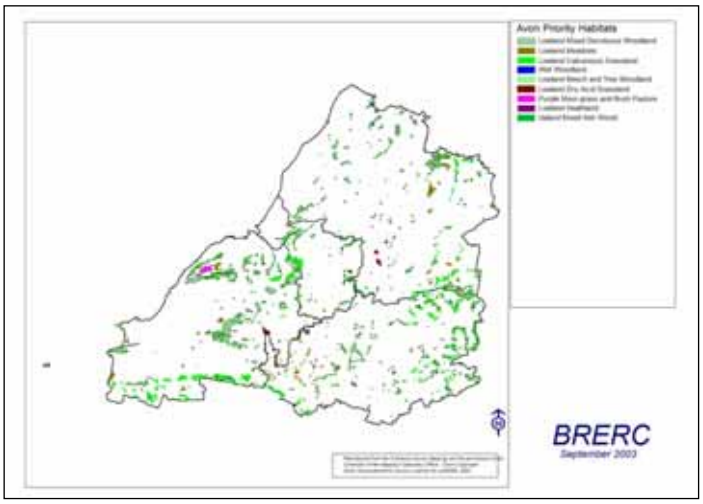


Figure 2. Map of BAP priority habitats in Avon.

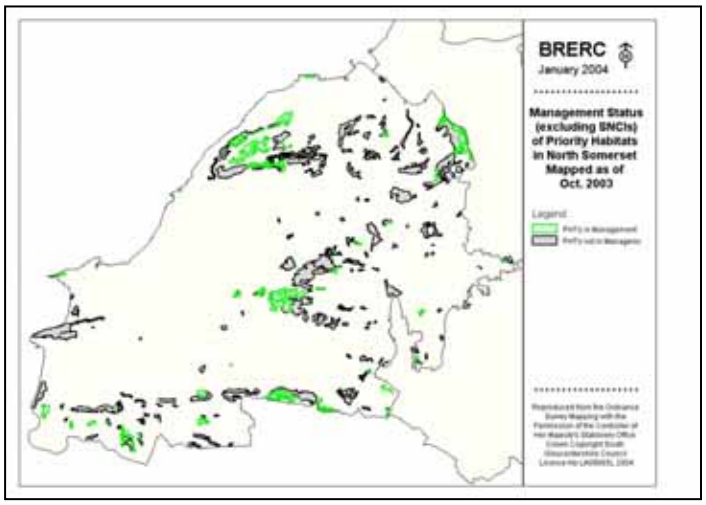


Figure 3. Priority habitats in North East Somerset under conservation management (green) and those not in management or where management is unknown (black).

A series of maps have been produced for the Avon Biodiversity Partnership to enable them to develop a more targeted strategy for protecting existing BAP priority habitats. The BAP partnership is focussing effort on those sites not currently protected or managed for conservation.

Initial analyses of the relationship between key habitats and species have confirmed that many of the species listed in the Avon BAP are dependent on BAP priority habitats for population maintenance and recovery. Figure 4 shows the coincidence between Grayling butterfly records and priority habitats in Avon. These sorts of analyses will help the Avon BAP to identify win-win actions and deliver species recovery through targeted management of habitats. This will enable them to deliver more wildlife gain with the same resource.

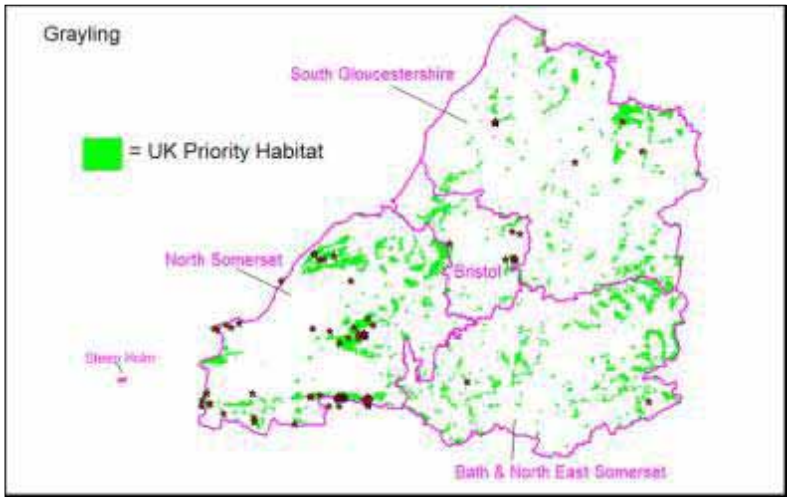


Figure 4. Relationship between grayling butterfly records and priority habitats in Avon.

In Dorset a similar analysis has been undertaken. In this case quantified estimates of the total area of priority habitat covered by different designations and management types (including ESA agreements) have been produced. This has been carried out for grasslands and lowland heathland.

Table 1. The area (ha) and proportion (%) of grassland and heathland priority habitats covered by different designations and management types in Dorset.

	Total area (ha)	SAC	SPA	RAM-SAR	ESA	SSSI	NNR	LNR	SNCI	Dorset WT	Not within SSSI or SNCI
Calcareous Grassland	3279	**37.6**	**0.00**	**0.00**	**53.1**	**54.3**	**4.3**	**0.00**	**43.5**	**1.3**	**2.2**
Acid Grassland	507	**29.4**	**15.6**	**23.4**	**2.4**	**47.2**	**0.6**	**3.6**	**52.5**	**2.4**	**0.3**
Lowland meadows	668	**17.7**	**0.1**	**2.7**	**0.9**	**54.6**	**0.0**	**0.1**	**44.0**	**9.0**	**1.4**
Purple Moor Grass & Rush Pasture	429	**22.6**	**8.5**	**17.3**	**7.3**	**48.9**	**0.0**	**0.00**	**49.0**	**7.8**	**2.1**
Lowland Heathland	3418	**92.0**	**91.9**	**77.8**	**0.0**	**92.9**	**23.3**	**1.8**	**5.0**	**7.3**	**2.0**

Key points raised by this analysis include:

- The vast majority of sites are afforded some level of protection. Almost all known habitat sites are covered by either statutory designation or through the local county wildlife sites network.
- In order to deliver the LBAP targets of maintaining existing lowland grassland habitats, ca. 50% of this must be delivered by SSSIs and the rest by SNCI network.
- Lowland heathland conservation in Dorset is almost entirely delivered through the statutory site network.

The information delivered by this analysis will be used to inform and prioritise actions within the Dorset BAP partnership. This analysis clearly shows that for grassland and heathland

English Nature and the Local Planning Authorities are **absolutely central** to delivery of the Local BAP targets. For example, one of the objectives in the Dorset LBAP is to prevent provision of grant aid to tree planting on existing calcareous grassland sites. Once the information is available on the Internet it will be accessible to organisations such as the Forestry Commission (FC), which grants tree-planting licences. FC Officers will be able to cross check applications against inventory data and discourage tree planting on these important grassland sites.

Benefits

Strategic analyses such as that conducted in Dorset can be fundamental to developing implementation plans for the Local BAP. The roles and contributions of key partners, including key land owners and advisors can be clearly assessed once the inventory information is available. This kind of analysis is similar to that employed by English Nature to identify key responsible parties and target and drive the delivery of the Public Service Agreement Target for SSSIs.

Assessing the designated site network within the wider context of the habitat resource provides a basis for English Nature and its BAP partners to quantify the contribution SSSIs and local designations make to BAP targets. This can help prioritorise resources and actions in the BAP towards those that will maximise delivery.

The value of the inventories in targeting local action cannot be underestimated. This finding backs up those of the RDS study elsewhere in this report. The first step in any nature conservation programme is to identify and map the resource, this is the first step towards protecting and enhancing it**.** Holding this information in a spatial database also enables us to assess the degree of protection afforded to existing resource and also the extent to which it is managed appropriately (where information about management exists). In particular it enables the overlap between Agri-Environment agreements and priority habitats to be assessed and targets could be set for increasing the proportion of wider countryside priority habitat covered by AE agreements or other site management mechanisms.

Constraints

Some key caveats need to be considered when conducting these analyses. The analyses are dependent on the habitat inventories being a ‘complete’ assessment of the resource in a given area. Much of the inventories in the South West were based on old data (eg in Dorset, depending on the habitat, between 50-80% of the sites were mapped using data more than 5 years old). Also the quality and regularity of update are likely to be higher for designated sites than for other sites. Therefore the possibility remains that a significant number of wider countryside sites are not accounted for in the analysis.

Once known sites have been safeguarded, in general BAP partners should focus on assessing the extent to which other sites should be surveyed and incorporated into the BAP process. The update process of the inventories also needs to incorporate new local survey wherever it is collected.

Lessons from the Dorset and Avon LBAP planning projects	
Positive	Some standard, simple analyses of habitat inventories can help target LBAP actions by identifying who the key delivery partners are, which habitats and sites are most at risk.
	The inventories map the current resource and therefore describe where existing sites are. This is a prerequisite to protecting, enhancing and extending them.
	The inventories can provide a key tool to deliver species recovery.
Negative	Take care when interpreting the data – it may not be as accurate or as up-to-date as you think!
	Much of the inventories may be based on out of date data. Very little new survey is done outside the statutory and county wildlife site series.
Key learning point	LRCs can provide important enabling services to LBAP partnerships and help target limited resource towards the right conservation priorities in the right places.

LBAP reporting in Cornwall

Introduction

This report summarises some key points from some work led by the Environmental Records Centre for Cornwall and the Isles of Scilly for the Local BAP partnership. The partnership had already developed a set of targets and action plans and was entering an implementation phase during the period of the pilot project. This work focussed on how the information held by ERCCIS could be used to prioritorise and target activities, measure outcomes and report through the developing national Biodiversity Action Reporting system (BARS).

The problem

After a period of target setting and action planning, most Local BAP partnerships are moving into an implementation phase where partners carry out activities to deliver the targets.

The LRC has information on the status of Cornwall biodiversity and hence is the natural starting point for identifying key priorities for action. The LBAP contains 119 species for action. Given the lack of resource to implement all actions, this begs the question, which are the most urgent?

Most LBAP partnerships do not have the resources to develop monitoring programmes to assess outcomes and hence the data collected through LRCs (and more widely by other contributors via NBN) is the only source of information on LBAP outcomes. ERCCIS focussed on how data on habitats and species held by the LRC could be used to target activity and assess outcomes.

The solution

ERCISS did the following:

- Identified the information needs of the LBAP partnership.
- Supported an analysis of conservation priorities within the county.

The analysis of conservation priorities was based on data held by ERCCIS and the expert opinion of local specialists (main local voluntary recorders and groups). The following table is an extract from the Cornwall LBAP plan and shows that the analysis provides a basis for conducting a risk-based approach to prioritising action across the 119 species listed in the LBAP. Local endemics that are declining are given higher priority (e. western rustwort) than nationally widespread species (eg skylark) or those that are not exposed to high threats locally (eg aquatic warbler).

Table 1. Four Cornwall LBAP listed species listed in theoretical declining order of priority in terms of national nature conservation risk.			
Species	**Position in Geographic Range**	**Local Status**	**Local Threat**
Western rustwort	Local endemic	Declining	High
Marsh earwort	National stronghold	Declining	High
Skylark	Widespread	Declining	High
Aquatic warbler	National stronghold	Static	Low

ERCCIS developed prototype habitat and species maps for use by the LBAP co-ordinator and partners for targeting action

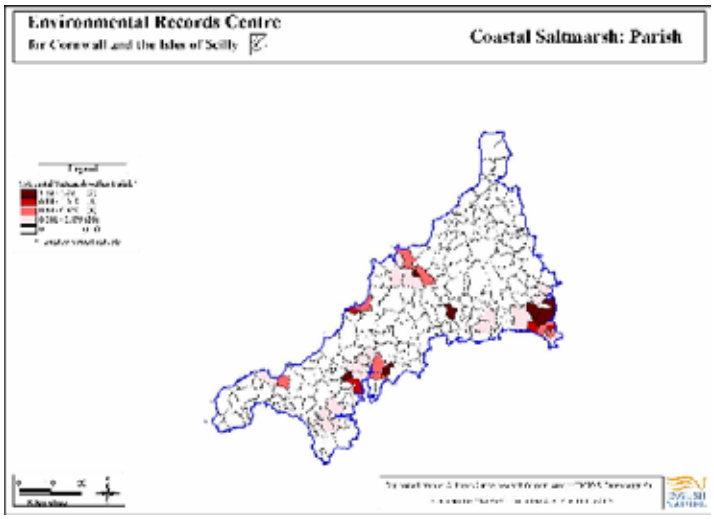


Figure 1. A map of Cornwall showing the current distribution of coastal saltmarsh priority habitat within parishes.

This map is being used to geographically target activities to deliver the relevant LBAP actions, and in particular engage local communities in biodiversity issues.

- Tested the BARS system with English Nature Area Team staff and the Cornwall Wildlife Trust, capturing information on activities on SSSIs and County Wildlife Sites.
- Developed a mechanism for integrating biological data on habitats and species with information on activities within BARS in order to assess outcomes associated with specific actions.

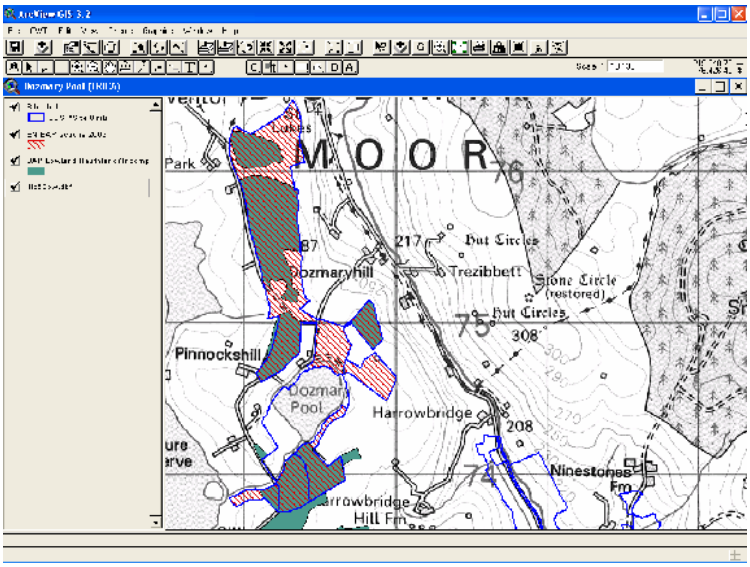


Figure 2. This map integrates the current known distribution of lowland heathland (green) with English Nature actions (red hatch) on Dozmary Pool SSSI site units (blue).

Benefits

If the information held by the LRC on the status of habitats and species is compared with national data available through the NBN and interpreted by local experts, a mechanism exists to rigorously assess key priorities for local action.

As illustrated by the RDS study, the habitat inventories are proving to be a key tool to target action in the wider environment particularly. In this case they have been used at a very local level within sites.

Presenting the data in geographical frameworks that the audience can relate to (in this case parishes) can be more influential and foster a greater ownership of biodiversity by others.

For the first time in Cornwall, the partnership is able to bring together information on activities with information on the current status of habitats and species. As long as the habitat and species information is regularly updated a mechanism exists to assess progress and impacts of LBAP actions at the local level without the need to implement specific monitoring programmes.

Constraints

A prototype of the BARS system was available for trial during this project. Two key constraints of this prototype are the lack of a ‘seamless’ link to using the data within a GIS and more importantly the lack of an import tool. For English Nature staff and most other partners management information is collected and managed within bespoke databases (eg ENSIS for English Nature) and it is not realistic to expect staff to enter the data twice. A viable mechanism for automated import needs to be in place before the system is implemented nationally.

Generally, both LRCs and LBAPs are struggling for adequate resource to deliver sustainable services. Here we have shown real synergies. LRCs can help make LBAP actions more focussed and targeted and support reporting functions – this can maximise delivery within

limited resources. LBAP partners should review whether the BAP co-ordination function should be better integrated with LRC functions so that a more economically viable and sustainable service can be developed.

Lessons from the Cornwall LBAP project	
Positive	LRC data viewed in the context of national data and informed by local experts provides a robust means by which to assess priorities
	Linking activity information to current habitat and species maps targets activity and provides a means by which to monitor outcomes at local level
Negative	Both LRCs and LBAPs are struggling to deliver sustainable services.
	BARS needs an import mechanism and robust link to GIS data
Key learning point	Consideration should be given to combining the BAP co-ordinator and Record Centre functions to maximise synergies and resources should be pooled to support a more viable service focussed on information provision and use.

Local Authorities

SERC and Local Authorities: Improving the evidence-base for planning decisions

Introduction

This project summarises a range of activities conducted by Somerset Environmental Record Centre during the course of the pilot project that aimed to explore the following:

- How existing biodiversity information services to Local Authorities could be improved.
- Identifying and scoping new services that local authorities would like.

The overall aim being to evaluate the benefits of LRC (and NBN) services to Local Government and provide some models for others to replicate or develop further.

The problem

Local Authorities have no **statutory** duty to fund LRCs or to ensure that they maintain a good evidence base for decisions relating to biodiversity. Government guidance (in particular PPG9 – Nature Conservation) makes it clear that biodiversity is a material consideration in planning but it is an area where 'ignorance is bliss'. If information does not exist on the presence of a species or habitat then it will not be considered within the planning process – whether it is there or not.

Nationally there is wide variation in the extent to which Local Authorities resource biodiversity generally and LRCs specifically. Where LRCs are well resourced, Local Authorities are invariably the key funding partners. If the NBN and NBN Gateway specifically cannot offer benefits to these users then LRCs will not see value in sharing data through the NBN Gateway.

The approach

SERC undertook a range of projects with specific Local Authorities to explore how its services could be improved and where the NBN Gateway could support this. These are detailed in a separate report (http://www.nbn.org.uk/swpilot) and only 2 specific elements are summarised here:

Developing an automated screening process for all planning applications in South Somerset District

SERC currently provides data searches for a subset of planning applications. This subset is selected by the district ecologist based on subjective assessment of risk to biodiversity. It was felt that an automated screening system would reduce the time spent screening applications by the ecologist and introduce more objectivity to the process.

A tool was developed in partnership with the district council and screening protocols agreed. A standard report was generated for each application with potential impact on biodiversity features. A sample of all planning applications received by the district were then screened using the tool and compared with the decisions that would have been made by the ecologist working on the original system.

Between 2 and 4 times as many applications were flagged as potentially having biodiversity impacts compared with those selected on the original system.

This tool was considered a valuable development of SERC's services and the Local Authority has funded the further development of the service. A web-based service would be desirable, as it would reduce the workload on SERC staff to run the tool. Such a service could be hosted on the NBN Gateway and potentially allow SERC to divert resources to other work. Joint develop between the LRC and NBN Gateway team is needed if this potential is to be realised.

A GIS-based tool was developed for Mendip District Council which could query SERC-held European protected species data on the NBN Gateway.

The ecologist at Mendip District Council expressed an interest in being able to directly access records for European protected species and other notable species via the web. The aim being to ensure that the species were properly taken into account in all relevant planning and policy decisions. As development of such a service on SERC's own website is beyond the resources available to SERC, a consultant was funded by English Nature to support the development of such a service via the NBN Gateway.

The tool works from within the users own GIS. Sites can be defined spatially within the GIS and a query sent to the NBN Gateway where the SERC data is held. A tailored report is then generated indicating the species present (see below)

Unfortunately by the time the tool had been developed the Ecologist at Mendip District Council was made redundant due to revision of the Authorities funding priorities. This

illustrates the fragile position of biodiversity within local government and its relatively low position on their agenda.

The tool was evaluated further by the council's GIS specialist. Some initial results were:

- The NBN Gateway does not have a facility to store linear features such as hedgerows – these can be valuable for Bat species and hence need to be referred to in planning applications.
- The Gateway provides access to the data but little interpretation. Where the data is interpreted by someone with ecological expertise this is not a major constraint. However, where an authority does not have access to such expertise, there would be more value in SERC providing a combined data search and interpretation service.
- If LRCs and their users are to draw benefit from the NBN Gateway there needs to be much more joint development work to meet local needs.

Key findings from the Somerset work

- Local Authorities have a strong *inferred* requirement for access to high quality biodiversity information services if they are to adequately fulfil their biodiversity responsibilities.
- Their needs in this area are likely to increase still further in the next few years with legislation and policy guidance changes in the pipeline (eg increasing responsibilities with respect to European protected species).
- Adequately resourced Local Records Centres are well placed to deliver these services to Local Authorities.
- Local Authority work on biodiversity generally may be poorly understood and communicated within authorities, especially among elected members. Resourcing can be sporadic and may change very quickly.
- It is possible that LRCs will be able to use the NBN Gateway to enhance their service delivery to Local Authorities but a Gateway data search tool developed in this project is yet to be fully tested.

Other partners

Several project partners were unable to run similar demonstrations and evaluations of using the data shared through the NBN. Several of these are planning similar studies, particularly replicating studies similar to that employed by Defra RDS.

- The Environment Agency is conducting an evaluation study involving conservation staff throughout the South West. This work is due to report in June 2004.
- The National Trust is also planning a similar study.
- Mendip District Council will continue its study in partnership with SERC.

The South West and national habitat inventories have been supplied to the following organisations:

BTO
CEH
Centre for Agri-Environmental Research (cÆR), University of Reading
Channel Coast Observatory
Cornwall Area of Outstanding Natural Beauty Unit
East Devon AONB
East of England Heathland Opportunity Mapping Project
Environment Agency
Environmental Research Branch, Forest Research Agency
Forest Research
Hampshire County Council
Herpotological Conservation Trust
JNCC
Land Use Consultants
National Data Centre, Environment Agency
National Trust
North Somerset Council
Northern Devon Coast and Countryside Service
Peak District National Park Authority
Penny Anderson Associates
RDS
RSPB
SLR Consulting
South Gloucestershire Council
South West Forest
Terra Consult
Thames Valley Environment Records Centre
University of Nottingham
West Dorset District Council

Summary

The value of the data generated by the pilot is beginning to be realised. Over the next 1-2 years we believe the benefits will grow as more users begin to develop new applications. In general the key findings from this work have been:

- Relatively small investments in habitat and species data and provision to key partners can enable English Nature to influence the activities of others, from Defra's Agri-Environment schemes to LBAPs
- A small suite of regional information products have been developed that are commonly owned by the biodiversity partnership and are a firm and scientifically robust basis on which to influence regional policy and monitor outcomes.
- English Nature's ability to deliver protected species advice and licensing is serious compromised where species information is non-existent or out of date
- Record Centres generally work very well for local users but don't currently meet the needs of regional or national users due to the gaps in the network and limited degree to which data is shared outside the LRC area of remit
- If adequately maintained the habitat inventories enable outcome-based reporting, which is crucial to the delivery of biodiversity targets and development of cost-effective conservation programmes.
- Improved access to biodiversity data significantly increases the cost effectiveness of AE schemes in delivering biodiversity objectives.
- LRCs can provide important enabling services to LBAP partnerships and help target limited resource towards the right conservation priorities in the right places.
- Consideration should be given to combining the BAP co-ordinator and Record Centre functions to maximise synergies and resources should be pooled to support a more viable service focussed on information provision and use.

These points and others are developed further in Parts 4 and 5 of this report.

Part 4 The lessons learnt

Introduction

This section of the report attempts a synthesis of the key findings of all the work across the project. Although we draw on the experiences of the project partners predominantly, wider experiences across the NBN nationally have been drawn upon where relevant.

This synthesis is structured to align as closely as possible to the Themed Steering Groups of the NBN. These are the audiences (as well as the NBN Trust, JNCC and country nature conservation agencies) that need to consider the messages coming from the project and act on them as they see fit.

The main sections relevant to the theme groups are:

- NBN Standards & Tools
- The NBN Gateway
- Local Record Centres
- Voluntary recording

Additional sections are provided because they are of particular relevance to the project and have no 'natural home' within the NBN decision-making structure. These are:

- habitat inventories;
- building the business case for NBN.

Standards and tools

Introduction

This section outlines the main activities undertaken in the project with regard to developing and practically testing NBN Standards and Tools. Some key lessons from this experience are captured. It makes a series of recommendations that should be used to influence future development work to support improved management of data capture, collation, maintenance and dissemination.

Aims

The project set out to:

a. practically test the adoption of NBN Data Exchange Principles with a range of data contributors and users;

b. identify best practice and use this to inform the future evolution and implementation of NBN Trust principles, policies and the standards and tools.

The evolution of NBN standards and tools

The Southwest Pilot presented an opportunity to practically test the NBN concept. The Data Exchange Principles provided the focus for this work as they embody the NBN Trust's primary ethos and principles.

In Spring 2000, when the project began, many of these standards and tools were still under development and not clearly defined. Inevitably, the NBN standards and tools have evolved during the course of the project.

Overcoming barriers to data exchange

The NBN Trust recognises that there are significant barriers to making biodiversity data widely available for use in line with the NBN Data Exchange Principles. A range of standards and tools have been developed to help data holders address these issues. The data access topics addressed in the Pilot were:

Establishing clear data policies, procedures, terms and conditions for data collation, maintenance and dissemination. This is required so that data owners can have confidence that their data will be managed and made available appropriately; and data users can understand the constraints for gaining access to and using data.

Clarifying authority to pass on and use data. This can ensure a clear understanding of whether you can use the data you hold/receive and make it, and any derived products, available to others for use.

Providing measures to control access to sensitive data. This can be important as some biodiversity data, if released into the wrong hands, could lead to damage to the natural environment.

Data of known quality

Providing data of known or readily determinable quality is important so as to allow any user to confidently assess their suitability for a particular use and gauge any use constraints or limitations.

Originally this work was encompassed by the NBN Trust's Accreditation Project. Work on accreditation initially focussed upon developing a proposal for Local Record Centres. This work is reported in the paper *A Proposal for an Accreditation System for Local Record Centres* prepared under the NBN Trust's Linking LRC Project (June 2001). A broader investigation into the applicability of accreditation for the wider NBN indicated that its further development and adoption was not appropriate at this time. Work has instead focussed upon delivering datasets of known or readily determinable quality.

Our approach

We believed in learning by doing. Therefore all participants were asked to identify datasets to mobilise through the NBN Gateway. All data contributors were asked to trial making the data they mobilised available in line with the NBN Data Exchange Principles.

The seven Local Record Centres

By summer 2003, a broad range of conceptual standards and tools had been developed to help data holders identify and manage data access and quality issues in-line with the NBN Data Exchange Principles. The seven LRCs involved in the SW Pilot committed time to investigate their relevance and trial their use. Each centre identified a single dataset to provide a focus for testing:

LRC	Dataset
Bristol Environmental Record Centre (BrERC)	Butterfly Data (Bristol/Avon)
Dorset Environmental Record Centre (DERC)	Dorset Wildlife Trust Tracking the Dorset Hare Project data
Devon Biological Record Centre (DBRC)	Devon Wildlife Trusts otter data
Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS)	Seaquest Southwest Marine Megafauna dataset (Cornwall)
Gloucestershire Environmental Data Unit (GEDU)	Common Toad Survey dataset (Gloucestershire)
Somerset Environmental Records Centre (SERC)	Somerset Otter Group data
Wiltshire and Swindon Biological Records Centre (WSBRC)	Great crested newt data (Wiltshire)

Butterfly Conservation (a large recording society)

In March 2003 Butterfly Conservation (BC) and Dorset Environmental Record Centre (DERC) investigated data exchange between their organisations. Documented NBN advice on information management was used to help improve the efficiency, effectiveness and transparency of butterfly data management, exchange and dissemination in Dorset. This work is reported in more detail elsewhere in this report and a detailed account is available on the NBN website (http://www.nbn.org.uk/swpilot).

Herpetological Conservation Trust (a smaller recording scheme)

The Herpetological Conservation Trust (HCT) engaged with the NBN through the Southwest Pilot as well as other routes. HCT used it as an opportunity to develop clear policies and clarify their authority to use and pass data on to others in a controlled way. They have looked to the NBN standards and tools to guide them in this process.

ERCCIS and BSBI work

The Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS) examined their data sharing relationship with local Vice County Recorders for the Botanical Society for the British Isles (BSBI). NBN advice on information management was used to great effect to support this process.

English Nature

a) Habitat and species inventories

English Nature led a variety of projects that drew upon data standards and tools. Much of this work looked at the role Local Record Centres could play in collecting, maintaining and disseminating data on English Nature's behalf.

English Nature contracted participating LRCs to mobilise new data to produce a Habitat Inventory for the Southwest region. This would enable English Nature officers to 'map' the existing biodiversity resource beyond the designated sites for which English Nature is directly responsible. The work involved a significant level of interpretation and the production of a new set of data. As this work was funded by English Nature, a clear agreement was established indicating that English Nature would have authority over the collated data and therefore decide how available to make them.

The LRCs were also asked by English Nature to mobilise BAP priority species data they already held through the NBN Gateway. As there was little interpretive work involved it was agreed that the LRCs would retain authority over the data and therefore decide how available to make them. However, it was agreed that the data would be made available to all SW Pilot Partners for the duration of the pilot, after which access levels would be reviewed.

b) Setting access to data

The NBN data exchange principles were adopted when deciding how available to make data that English Nature uploaded to the NBN Gateway. As a public body English Nature have to make data available to the public in accordance with the Environmental Information Regulations and Freedom of Information Act. This legislation requires public bodies to make data available to the public unless there are legitimate reasons to restrict access, on grounds of sensitivity for example.

Scope for charging to cover the administrative costs of providing data is provided both under the legislation above and in the NBN data exchange principles. However, English Nature has a policy of not charging for the provision of data even though significant staff resource may

be required to meet requests. It was decided that the cost of processing payments outweighed any savings access payments might make.

Gateway access decisions:

Dataset: **Dormouse site inventory**					
Users with access:					
User	**Resolution**	**View sensitive**	**Use data**	**View attributes**	**Data validation**
Public user access	full				
Full public access provided as there are no significant sensitivities associated with the data					

Dataset: **Batsites inventory for Britain**					
Users with access:					
User	**Resolution**	**View sensitive**	**Use data**	**View attributes**	**Data validation**
Public user access	10km		Y		
Full public access not provided due to the sensitivities related to the precise locations of bat roosts					
Organisations with access:					
User	**Resolution**	**View sensitive**	**Use data**	**View attributes**	**Data validation**
Countryside Council for Wales	full	Y	Y	Y	
English Nature	full	Y	Y	Y	
Scottish Natural Heritage	full	Y	Y	Y	
Centre for Ecology and Hydrology	1km		Y		

Royal Society for the Protection of Birds

Early on the RSPB took a strong decision on its authority to make decisions about the data it held. Any data the society had received from its members and active recorders are taken to have been submitted for use as the Society sees fit. This position has been bolstered by clear RSPB policies on data access and privacy. However, there are some significant datasets that RSPB has produced in collaboration with other organisations, such as the British Trust for Ornithology. Here decisions on availability must be made in consultation.

The RSPB experience is that it can take considerable time and effort for the decision to be made within an organisation to deliver a dataset. This can largely be attributed to the initial lack of clear and established internal processes. The RSPB is now in the final stages of completing a comprehensive set of instructions to help RSPB staff mobilise further datasets through the NBN in the future. The Pilot played a significant role in encouraging the Society to make the necessary decisions needed to free up internal constraints.

How successful were we?

The topics set out below together with their associated issues were addressed as part of this trial. The participating organisations worked to the relevant NBN standards using the tools and products identified below.

Topic 1	**Clear data policies, procedures, terms and conditions**
Need	A clear understanding of the terms and conditions under which data is collated, maintained and disseminated to others for use is required so that: a. data owners can have confidence that their data will be managed and made available appropriately; and, b. data users can understand any constraints to gaining access to and using data.
NBN standard	NBN Data Exchange Principle 5: Managers of biodiversity data should make their framework of terms and conditions publicly-available, allowing biodiversity data owners to have confidence that control will be exercised in the management and use of their data.
Tools / products tested	NBN Data Exchange Principles (version 3.2) Data Access Policy – a conceptual paper clearly setting out the principles by which you intend to make decisions regarding the dissemination of data to others for use. NBN Gateway Privacy Policy (as a model clearly setting out what personal data you collect and hold, what you use this for and to whom you make it available.) Access Position Statement – a conceptual paper for individual datasets setting out the decisions made regarding its availability in accordance with the Data Access Policy. NBN Gateway General Terms and Conditions

Topic 2	**Authority to pass on and use data**
Need	It is important to have a clear understanding of whether you can use the data you hold/receive and make it, and any derived products, available to others for use.
NBN standard	NBN Data Exchange Principle 4: A clear transfer of authority should be made when a biodiversity data resource is put together, to allow biodiversity managers to act on behalf of the biodiversity data owners.
Tools / products tested	Clarifying authority to pass on and use existing wildlife data (version 1.1) NBN Framework for the Transfer of Authority to use Biodiversity Data (version 2.2) NBN Model Data Collation Licence (version 1) NBN Model Data Custodianship Agreement (version 1) NBN Model Recording Form Statement (version 2.2)

Topic 3	Controlling access to sensitive data
Need	Some biodiversity data, if released into the wrong hands, could lead to damage to the natural environment. It is important to control levels of access to sensitive data and make it available to those that need it at an appropriate level of detail.
NBN standard	NBN Data Exchange Principle 2: Making biodiversity data available should reduce the risk of damage to the environment. If it is likely to have the opposite effect, availability may need to be controlled.
	NBN Data Exchange Principle 6: Personal data must be managed in accordance with the principles of the Data Protection Act 1998 and/or any subsequent legal provisions.
Tools / products tested	NBN Data Exchange Principles (version 3.2). NBN Gateway Access Controls. NBN Gateway General Terms and Conditions.

Topic 4	Data of known or readily determinable quality
Need	Data of known or readily determinable quality is important so as to allow any user to confidently assess its suitability for a particular use and gauge any use constraints or limitations. This can be communicated through metadata (descriptive and background information) accompanying a dataset.
NBN Standard	NBN Data Exchange Principle 3: Biodiversity data suppliers should make available sufficient meta-data to allow biodiversity data users to assess the scope and potential uses of their information holdings. When biodiversity data are supplied, accompanying information (meta-data) on its ownership, methods and scale of collection and limitations of interpretation, should be provided.
Tools / Products tested	NBN Metadata Standard (version 1). RSPB Access Database for compiling NBN Metadata. Information Management: a step-by-step approach (version 1.3).

Feedback from practical trials

The following feedback was received from those partners that took part in data access trials over the three years of the Pilot. *No single comment should be taken as the opinion stated by all those that participated.*

i. General comments:

- ✓ The advent of the NBN initiative in the South-West highlighted the importance of many issues previously neglected due to resource constraints. The project gave many of those involved the time, expert advice and support of partners to tackle these issues.
- ✓ The standards and tools developed by the NBN Trust provided a means to address data access and quality management issues. Most felt that these have helped data holders update, or in many cases create, documents and standards that will clarify their **data sharing partnerships with many different groups and individuals, which would probably not have happened otherwise.**
- ✘ Several highlighted that not all data providers have the resources to undertake the advised tasks in their entirety. There is also an ongoing need for expert advice and

training in these areas. Generally those that fund data providers do not like funding data management tasks over and above data entry.

- ✘ A view was expressed that the issues being promoted and addressed by the NBN Trust may not have been issues until they were raised.
- ✘ The consensus view was that there is a lot of good information and guidance available from the NBN Trust but no readily available index or central reference point to coordinate access to it.
- ✘ Many found that technical jargon often made existing guidance documents heavy going.

ii'. Information management:

- ✓ The NBN Trust document: 'Information Management: A step-by-step approach' (http://www.nbn.org.uk/swpilot) was singled out as a useful tool as it provided a process within which data managers can identify issues and propose practical solutions drawing from and applying NBN standards and tools where appropriate.

iii. Data access policies:

- ✓ The general consensus was that having clear policies for data acquisition and use helped to standardise approaches and build confidence in data management.
- ✓ A view was expressed that the NBN guidance documents on this area were useful and well focused.

iv. Legal advice:

- ✓ It was highlighted by many that there has long been a need for a set of standardised agreements that have been legally checked which could be applied by data managers to suit individual needs.
- ✓ The view was expressed that the Pilot provided a much-needed opportunity to investigate the legal issues and apply the model licences developed by the NBN Trust.
- ✘ Several pointed out that implementing all the NBN standards and tools for a given dataset creates a lot of work. The process needs to be simplified. One participant highlighted that they spent about three weeks working through this process for one dataset.
- ✘ Some found the generic NBN model licence agreements difficult to apply directly and had problems with them only covering one way transfer of data between the individuals/ organisations involved.
- ✘ Most found the formal approach of the legally advised NBN model licence agreements extremely off-putting, particularly to individual voluntary recorders and smaller groups. The *Model Recording Form Statement* provided most with a more practical, less formal and recorder friendly alternative to clarify permissions.

v. Metadata:

- ✓ The NBN Metadata Standard was generally seen as being useful and well focussed, incorporating the experiences of various data holders.
- ✘ Some expressed difficulties in describing the processes of data collection for datasets with a wide taxonomic range or that are non-survey specific in sufficient detail to

support an understanding of its quality. One participant suggested that guidelines as to how NBNT defines a dataset may help data providers use metadata more effectively.

- ✘ There are a wide variety of existing tools being used by data holders to collate metadata. Several pointed out that there is no guidance on how these might be used to meet the NBN Metadata Standard.

vi. NBN Gateway administration tools:

- ✓ The majority welcomed the revised access controls on the new NBN Gateway (to be launched in June'04) based upon controlling the resolution at which data can be viewed. Several reported that the new system works well, a significant improvement on the limitations and inefficiencies of the previous controls. It also provides a flexible approach to regulating the access levels awarded different users and groups.
- ✓ A few participants contributed polygon datasets rather than point datasets (ie each had a boundary, such as a field or lake, which represented the area of the record count/observation) that are not currently supported by the Gateway. It is welcomed that the Gateway is evolving (albeit at a pace limited by practicalities) to accommodate this and other types of data and uses that were not originally something envisaged.
- ✘ Some feel that the administration of access can still be improved to make it a quick and efficient process for all data providers. One participant highlighted that there is currently no way to set common access levels for all datasets you have contributed at once, nor the capability to set administrator defined user groups. One key problem with the Pilot Project has been getting data contributors to implement an access policy on the NBN Gateway once a datasets has been loaded.
- ✘ Many feel that access to data through the NBN Gateway must reflect the current cost of collecting, collating and mobilising the data. Using the Gateway access controls to facilitate funding streams was not practically examined by any of the project participants, in part due to the test/development status of the NBN Gateway.

What have we learnt?

Issue: Managing time and priorities

The NBN standards and tools address significant data access and quality management issues that are relevant whether data is shared through the NBN Gateway or not (eg the Data Protection Act). However, many of these issues are not recognised as a priority within the existing work programmes of data managers. This means that users of the information they provide are not raising these issues. Those that tested the standards and tools in the Pilot were resourced to do so and therefore able to commit the time required.

Solution: Those that fund biodiversity data managers need to appreciate the relevance of these issues and ensure they are given due attention. The NBN Trust should support data managers in communicating these issues effectively to those funding them. NBN standards and tools should be made as clear and easy to use as possible.

Issue: Clear and coordinated guidance

The project provided an early practical opportunity to test and develop conceptual NBN standards and tools. The level of well-developed written guidance available to those partaking in the trial was limited. This made it difficult for participants to independently identify relevant NBN standards and confidently apply NBN tools.

Solution: Building upon the experiences gained in the project the NBN Trust should draw together relevant standards and tools within a clear framework of co-ordinated, jargon-free guidance and advice. Practical examples and simple case studies also have an important role to play. This information resource should be made readily available to anyone that needs it.

Issue: User-friendly agreements

The NBN model licence agreements were developed in close consultation with the NBN Trust's lawyers and represent the advised format necessary to cover generic data exchange within the law. The generic models do not apply directly to the many varied data exchange arrangements that exist in reality. The formal and complex legal format of the models is seen by many data managers as very off-putting and they fear that this will discourage many voluntary recorders from passing them data.

Solution: The lessons and advice for different data exchange situations is as follows:

Volunteer / individual recorder to data manager exchange: Where volunteers play a consistent and important role in data collection, verification and/or collation it may be necessary to establish clear permission to use and pass on collated data from them in a less formal way. In all cases this should be a transparent, open and honest exercise:

a) *Recorder to data manager exchange*: The NBN Trust has developed a simple but clear statement for use on a recording form (and in other formats) to clarify permission to use data submitted by individual recorders in a less-threatening manner.

b) *Voluntary verifier / collator to data manager exchange*: Make it clear to all involved the various steps, processes and agreements in the flow of data from recorder to end distribution. This can build confidence that the volunteers involved understand their role and what happens to their data. By continuing to partake they are consenting to use of their data in this way.

Data manager to data manager exchanges: A more formal agreement with clearly defined terms and conditions is likely to be acceptable at this level. The NBN model licence agreements should be viewed as generic models to be adapted to suit particular needs. More examples of how these have been interpreted and implemented by different data holders will become available in the future. In the meantime the NBN Trust Access Project Officer can help data providers adapt the models to suit their own needs.

Issue: Clear and easy to use metadata

Although the NBN Metadata Standard was perceived as being clear and well documented, many data managers found it difficult to apply consistently and effectively to disparate datasets. Metadata must meet the needs of the data manager as well as potential data users.

Solution: The NBN Trust should clarify:

a. the purpose of the metadata standard and the type of dataset to which it is best suited;

b. which of the fields are essential and which can be automatically populated on the NBN Gateway; and,

c. how different metadata tools can be used to meet the NBN metadata standard.

Issue: Clear policies and procedures

The participants in the SW Pilot welcomed the opportunity to revisit and establish clear data management policies and procedures. The NBN standards and tools provided a useful source of support. This will be complimented in the future by increased availability of examples and case studies.

NBN Gateway access administration controls

The access controls on the revised version of the NBN Gateway were generally welcomed and seen as an improvement. They provide a flexible approach to regulating the access levels awarded different users and user groups. However, there is call for the controls to improve further, particularly to provide a fast and efficient method of setting common levels of access across datasets and supporting administrator defined user groups.

Solution: The NBN Trust should continue to develop and evolve the administration controls to ensure they meet the needs of data providers. In particular future development should consider facilitating common access settings for multiple datasets and administrator defined user groups.

Key lessons

Future data collection, collation and dissemination:

- Wherever possible it is good practice to consider the various data handling processes and steps to be followed prior to the start of any recording. This best practice should be adopted and promoted by data custodians engaged directly or indirectly in any data collection activity. The NBN Trust paper *Information Management: a step-by-step approach* may help data managers to do this.
- It is good practice to identify **one** individual or body to act as custodian over a collated data resource. This may be a Local Record Centre, Recording Scheme/Society, Larger Biodiversity Organisation or Individual provided they have sufficient time, resource and skills. The data custodian should be sufficiently empowered by the data owner/s to maintain the data in the long term and manage its availability for others to use in an agreed way.
- It is important for data holders to be open and clear about how any data received will be used. Clear published policies and procedures on managing access to data can help achieve this. Formal licences and/or less formal permission statements can help establish clearer authority to use and pass on data in this way.
- Contextual information about when, where, why and how the data was collected and processed, and who was involved is useful for management of that data in the long term and for informing data users. A balance may need to be struck between meeting

the needs of data managers and potential users, but the information collated must maintain understanding of the resource should those familiar with it be unavailable or depart from their current position.

Evolution of NBN Trust standards and tools:

- The NBN Trust has developed a comprehensive range of conceptual standards and tools to help data holders and managers address access and quality management issues. Testing has provided experience and constructive feedback that will be used to further develop these standards and tools to become effective practical products.
- The NBN Trust needs to develop appropriate guidance and advice to help data holders and managers adopt NBN tools and work to NBN standards. This guidance and advice needs to be coordinated within a clear framework in order to provide a clearly accessible information resource for anyone wishing to make data they hold more available for others to use.
- Those that fund biodiversity data collection, collation and dissemination need to support data holders and managers to enable them to commit sufficient resources to address data access and quality management issues. This needs to be targeted towards those datasets where it can add value and help increase access and use.

Conclusions

The NBN initiative has filled some key gaps in data standards and data exchange policy. These can be effective tools in helping to open up access to data. They can however, be very time consuming to implement, and currently data custodians often do not have the time to make effective use of them. Blanket implementation of all the NBN standards and tools is not a realistic or appropriate goal. **These tools must be applied in a targeted manner in circumstances where it is likely to make a real difference in enabling enhanced data access and use. They also need to be integrated into existing working practices wherever possible.** English Nature and RSPB have demonstrated targeted integration of standards into normal working practices without imposing significant additional resource demands.

This trial has helped demonstrate that the NBN initiative is largely about people and relationships rather than technical issues. Data suppliers are generally willing to have their data made available to users provided that they trust the people and organisations involved and adequate resources are available to the supplier to meet the user needs. Adopting clear and transparent data management policies, processes and procedures can help nurture this trust, but this needs to be combined with adequate resourcing of, and relationship building with, data suppliers.

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Using the NBN Gateway

Introduction

This section explains how the NBN Gateway has been used by data contributors and users during the project and assesses the strengths and weaknesses of the Gateway as a tool for enabling organisations to disseminate their biological data. Specific examples of using data from the NBN Gateway are included in other sections of this report.

Aims

The project set out to:

- Establish and promote protocols for data transfer to the NBN Gateway with data suppliers.
- Coordinate the development of data access conditions and their implementation on the NBN Gateway.
- Trial prototypes of data supply/access through the NBN Gateway with key data users and suppliers/custodians.
- Promote wider use of the NBN Gateway with other data users and collate feedback
- Provide feedback to the NBN Gateway team on future development

Our approach

Establish and promote protocols for data transfer to the NBN Gateway with data suppliers.

In the early stages of the project no standard format existed for loading data to the NBN Gateway. Initially English Nature developed a guidance note with the NBN Gateway team. Even with this guidance, for some time there was confusion amongst data contributors on how to provide data to the Gateway. This resulted in data in a range of formats being submitted, resulting a significant additional workload on the NBN Gateway team to reformat data before upload.

Towards the end of the project a standard import format was designed for species records. This required data to be converted to a spreadsheet format with a separate row for each species record. A stand-alone application was developed to match the species names against the NBN Species Dictionary and to convert the data into a format that could be readily imported into the NBN Gateway.

Where species data were already stored in Recorder 2000, they were uploaded to the Gateway using routines developed by the NBN Gateway team.

Habitat datasets were supplied to the NBN Gateway as ESRI shapefiles.

All datasets were supplied with corresponding metadata that indicated details of the basis and limitations of the dataset.

Coordinate the development of data access conditions and their implementation on the NBN Gateway.

The policy on data access within the project was that LRCs would provide access to datasets on the NBN Gateway to project partners and this arrangement would be reciprocal. The implementation of this policy was followed up by contacting those who had the authority to grant access, negotiating acceptable levels of access for the project partnership and providing technical assistance to data administrators where necessary.

Based on the feedback from this process the approach for controlling access to datasets was reviewed and the functionality of the NBN Gateway was changed to reflect this.

Trial prototypes of data supply/access through NBN Gateway with key data users and suppliers/custodians

LRCs liased with data contributors and gained agreement to upload to the NBN Gateway datasets for key species identified as part of the Southwest Pilot.

Butterfly Conservation and Dorset Environmental Records Centre have proposed a data flow model for butterfly records collected within the county (this is referred to in detail in Parts 2 & 4). They have also drafted a data supply and use agreement, recorder licenses and access policy. Butterfly Conservation's national butterfly distribution records have been made available via the NBN Gateway.

The Herpetological Conservation Trust has developed a data access policy for their data, and a dataset has been uploaded onto the NBN Gateway (see Part 4).

Promote wider use of the NBN Gateway with other data users and collate feedback.

As part of the RDS trial their internal GEN-i system was set-up to retrieve reports based on species and habitat data from the NBN Gateway (see Part 3).

Somerset Environmental Records Centre working with a technical consultant, developed a web-based tool for querying the NBN Gateway from within users GIS. This was developed to delivering species data to service level agreement holders and consultants.

As the project progressed less emphasis was placed on using the NBN Gateway for user evaluations. This was because the NBN Gateway was going through a development phase and was unreliable. Also it was noted that the NBN Gateway was only one mechanism for sharing data through the NBN and that data providers and users should determine the mechanism by which they access the data. In practice many evaluations were conducted at local level using LRCs to access data, this presented a more reliable mechanism to conduct the trials.

Provide feedback to the NBN Gateway project on future development.

English Nature ran a workshop for their Area Team staff from the South-West to promote the NBN Gateway as a source of species and habitat data. They provided feedback on the access they require to assist them in casework and managing designated sites and how this could be delivered through the NBN Gateway.

How successful were we?

Establish and promote protocols for data transfer to the NBN Gateway with data suppliers.

Having a standard format for data loading made preparing data for the NBN Gateway a relatively straightforward process for anyone reasonably familiar with manipulating data. Often however, data was supplied in a variety of formats and this resulted in a lot of work for the NBN Gateway team in reformatting this data in order to load it onto the NBN Gateway. This wasn't helped by the fact that datasets were often divided up by species, necessitated in order to administer access to species separately on the Gateway.

There was often misunderstanding as to how to load data onto the Gateway. This included the assumption that data had to first be entered into the Recorder software or only NBN accredited organisations could provide data to the NBN Gateway. A Gateway Standard Import Format for species and biotope occurrence data has now been developed and promoted by the NBN Gateway team. It remains relatively untested.

Inconsistency between the NBN Metadata Standard and the fields reported by the NBN Gateway led to confusion amongst data suppliers. Neither was there a standard tool for collating metadata that conformed to the NBN Metadata Standard. The latest version of the NBN Gateway now uses a subset of the fields of the NBN Metadata Standard. It also enables dataset administrators to edit metadata directly on the Gateway.

Coordinate the development of data access conditions and their implementation on the NBN Gateway.

Following feedback from the consultations over access controls the administration of datasets on the Gateway has been rationalised. Previously access to datasets for a given user or individual was granted for a specific product eg 10km dot map, interactive map, download etc. As the number of products increased dataset administrators either found that data was accessible in a way they hadn't anticipated or they weren't necessarily aware of the additional access controls. The new administrative controls set a spatial resolution that a user or organisation has access to, ie 10km, 2km, 1km, or full, and whether they have access to view or download records and whether this includes sensitive records and attributes.

Even with this improved functionality it has proved difficult to get data contributors to implement agreed access policies for datasets they have uploaded to the NBN Gateway. This may be due to a combination of skills/knowledge gaps and the task being given low priority by contributors. This relates to the fact that contributors may not see immediate benefits in providing their data to the Gateway.

Trial prototypes of data supply/access through NBN Gateway with key data users and suppliers / custodians.

The main concerns of data custodians of making their data available via the NBN Gateway were:

- Whether it would affect their funding;
- Whether it would lead to misinterpretation of data;

- Whether they had the authority to make the data available;

All the LRCs uploaded significant amounts of data to the NBN Gateway. The amount of data loaded varied according to the different LRCs perception of the risks listed above.

Butterfly Conservation made all of their older records available at full resolution but their most recent records were made available only at 10km resolution.

We found that it was difficult and time consuming to negotiate access policies for datasets. Potentially there are several relationships to manage in this process, both from the contributors to the range of potential users. Managing access at dataset level also imposes serious resource demands.

A more efficient approach would be to promote default levels of access for all datasets. (For example public access to all 10km species records and full precision access to the statutory conservation agencies and NBN members).

What have we learnt?

Issue: Contributing data to the NBN Gateway

- There has been considerable misunderstanding about how to make data available via the NBN Gateway.
- Much of the data available through the Gateway was collected 5-10 years ago.
- Some data providers believe that making data available through the NBN Gateway would compromise their future funding position.

Solutions

As well as developing standard formats for uploading data to the NBN Gateway there needs to be information and training readily accessible to potential data contributors on this. This applies equally to the access controls.

In order to facilitate making data available by data providers through the NBN Gateway and to ensure regular update of these datasets, it is necessary to establish sustainable funding for these organisations.

In order to manage the risks associated with enhanced access to data, interim access positions can be helpful. For example, the LRCs in the Southwest have agreed an interim access position of making datasets available through the Gateway to the general public at 10km resolution with full access to service level agreement holders at the resolution at which there were collected. This enables them to manage the risk associated with providing access to users who may have expected to make resource contributions through SLAs.

The relationship between Local Record Centres and National Recording Groups needs to be clarified. Efficient and commonly owned working models need to be worked up. Significant progress cannot be made in clarifying these issues unless adequate resources are made available to these groups.

Issue: Usability of the NBN Gateway

- There is a risk that the NBN as a whole and the NBN Gateway are too removed from the needs of the volunteer recorders who are contributing to datasets. What's in it for them?
- The user interface for the NBN Gateway was found to be confusing for users. It was unclear as to what the target audience for the Gateway was. Navigation of the Gateway involved selecting a product then selecting a species by scientific name. With the exception of designated sites it was not possible to find out what species had been recorded at a specific location.
- The NBN Gateway was found to be slow and unstable at times. This was sufficient to discourage some users from taking a second look.
- A number of problems existed with the species dictionary which meant that results were at times confusing, for example dormouse has been recorded as dormouse, common dormouse and *Muscardinus avellanarius* but there is currently no list that ties all these together.
- For managing biodiversity at a local level, users could see the potential of the NBN Gateway once it has sufficient data at sufficient resolution for querying data from a number of sources. Many did not see having access to 10km atlas style national datasets as particularly useful.

Solution

Performance of the Gateway is being addressed by changing the technology that underpins the NBN Gateway. Even with this new approach, which includes an off-line development server and database, there are still concerns that the development of the Gateway is too reactive and that there needs to be a longer period of consultation, consolidation and prioritisation of requirements.

There was a clear interest expressed during the project for customised outputs from the NBN Gateway. During the Project an XML service has been developed enabling data to be queried from the NBN Gateway and packaged to meet the end users' needs and potentially presented through their own system. Species data from the Gateway can therefore be integrated with other data sources. Potential applications for this include retrieving data from the NBN Gateway to desktop GIS; integrating with existing IT systems, such as in the case of RDS's GEN-i system; or providing interoperation with other web-based information systems such as MAGIC or Nature on the Map.

The NBN Gateway interface has been redesigned so as to be more intuitive. The user now searches for a species by scientific or common name or by searching through a hierarchy of common species groups. A list of available products for these species is then displayed.

A balance has to be struck between short-term and long-term objectives. In order to demonstrate that the NBN Gateway is a viable tool we need to move from a 'developmental' product into an operational tool. This will mean focussing on specific applications for which sufficient data are available and making sure the Gateway fully meets these needs.

Lessons from the work with the NBN Gateway	
Positive	The potential of the NBN Gateway has been demonstrated as a tool for delivering biodiversity data of known quality collated from a number of sources where the data custodian retains control over access to that data.
Negative	The NBN Gateway is still seen as a centralistic / bureaucratic system aimed at national government and far removed from the needs of the volunteers collecting data.
Key learning point	Development of the NBN Gateway needs to be targeted at specific user groups. This may mean different views on the data provided by different [external] services.
	A greater level of consultation is needed in identifying user requirements for the NBN Gateway. Development needs to be less reactive and focused on meeting key current operational needs.
	Data can only be mobilised via the NBN Gateway and regularly updated once adequate funding has been established for the organisations collating and managing the data. Interim access positions can be defined and adopted as sustainable funding packages are developed.
	The needs of those providing data should be considered along with those funding or using the data.

Local Record Centres

Introduction

This section is intended to capture the key findings of the project with regard to Local Record Centres. LRCs were regarded as 'working partners' to the project, delivering key products such as inventories to the wider partnership, but also contributing to the testing and development of the standards and tools developed by the NBN. In particular this synthesis represents the views of the LRCs engaged in the project; the lessons they have learnt from the exercise and their views on the future.

Each LRC produced a series of reports for the Project. These are directly accessible via the following link (http://www.nbn.org.uk/swpilot) or from the LRCs themselves.

The summary presented here is largely based on a workshop held towards the end of the project where LRCs had a wide-ranging and undirected discussion of their experiences in the project. Direct quotations from that workshop are used where they reflect the views of the group.
Also presented is the summary of a report undertaken by the LRCs on business models and some proposals are made for how the LRC network could develop further as an integral part of the NBN.

Summary of the workshop

The key issues raised can be structured into four key themes:

- communications and common understanding;
- support from the NBN Technical Team;
- user needs and the future development of LRCs;
- working with volunteers.

We attempt here to simply relay as accurately as possible the views of the LRCs, we do not attempt to analyse, prove or disprove the statements made here. The key point is that these are perceptions and beliefs held by the Southwest LRCs and these issues need to be addressed if LRCs are to be fully integrated into the NBN and consider themselves an integral 'part' of the network.

Building the partnership

At the start of the project English Nature held several meetings with the Southwest LRC managers to help identify their role in the Project and build a workable partnership. It took up to 18 months discussion before the LRCs and English Nature could agree an approach to trialling enhanced access to data through the NBN Gateway. The LRCs came to the project feeling disenfranchised from the NBN initiative and generally felt 'outside' the network even though (or perhaps because?) many had been directly involved in previous NBN projects. English Nature and the LRCs invested significant time in building a partnership. This partnership was founded on trust and open recognition and discussion of respective concerns. For example English Nature agreed that work was required to explore Principle 7 of the data

exchange principles (on charging for data – a highly contentious issue for LRCs) in more detail and that the door should be open for amendment of the NBN Trust's policies if the policy was unworkable.

One issue on which all agreed was that the NBN initiative held great potential, and that improved accessibility and use of biological information was an agreed objective. It was the 'how' which caused problems. The key benefit of the Pilot was that it provided a risk-free environment in which to test new working approaches and policies (partners were given licence to 'make mistakes' without the repercussions). None of the LRCs or other partners (several National Recording Groups held similar views to the LRCs) were asked to commit to anything beyond the project end. On this basis a strong and productive partnership was established where innovative approaches were given opportunity to develop.

Communications & achieving common understanding

Even though the LRCs were part of a co-ordinated project most felt that they would have benefited from improved communication between LRCs. This would have enabled more sharing of best practice and skills and helped build a greater feeling of teamwork. Communication between NBN officers was often poor. Often follow-up was slow or non-existent. Most felt that expectations of LRCs (and voluntary recorders) should be managed very carefully. Often promises are made and not delivered – a common theme in NBN. Guidance issued by NBN officers was often thought to be difficult to understand and use – the metadata guidance was one area in particular need of improvement.

Mixed messages were often heard from NBN officers and national partners. An example was a perceived difference in views from English Nature national and local staff. Different national NBN partners have different views on LRCs and this often resulted in confusing messages from 'NBN'.

Most LRCs reported mixed perceptions of the NBN and many LRC staff see it as a threat to their role. Much of this hinges on the perceptions of the NBN Gateway and the commonly promoted view that it could/should meet the needs of both local and national users. LRCs in this project have shown that at county level LRCs **are** the NBN and have been promoting data sharing for some time. Many local users with functioning LRCs (including voluntary recorders) see little added value of the NBN Gateway. The NBN Gateway needs to focus and define its key audiences. Having said this all LRCs believe in the ethos of the NBN and its underlying aims of improving access and use of biodiversity data. The LRCs want to see the NBN initiative work.

Support from the NBN Technical Team and related problems

Here the NBN Team is referred to broadly as any officer working directly for the NBN Trust or one of its national partners directly responsible for developing NBN projects and engaging with LRCs. This includes English Nature's project staff.

There were many frustrations here. The LRCs felt that often they were simply not listened to and/or their views were not acted upon. The key example is that issues surrounding Principle 7 of the NBN Data Exchange Principles although raised several years ago were not actively tackled until the Southwest Pilot provided the opportunity and resource to do so. The NBN Gateway team were considered distant and did not manage the expectations of LRCs well.

The Gateway is still some way from being a tool that LRCs can take up and use to support their work for their local users.

The Pilot Project was welcomed as the first real opportunity for LRCs to consider NBN issues in detail. Up until the Project started few LRCs had the time or reason to do so. Benefits of this work have been realised and the work of the NBN Access Officer in supporting LRCs to work through issues has been welcomed.

The Recorder 2000 project was welcomed when initiated. However, it is another area of technical development that has been rather distant from the needs of LRCs. In recent years this has partly been addressed through the development of user groups and the development of Recorder 2002 and Recorder 6, which is much improved. The reporting functionality of Recorder is still seen to be a key constraint by LRCs. Many LRCs do not have the technical skills to develop customised reports themselves. There was also agreement that Recorder 2002 is not the universal solution that it was once held up to be. LRCs are at the sharp end dealing with data in a range of formats – this can have significant resource implications when dealing with data from voluntary recorders.

User needs and the future development of LRCs

Most LRCs and their funding partners are happy with their current service. The question often asked by any local user or LRC is 'Why should we change?'

A key issue is definition of users and their needs. LRCs have a very clear idea of their local user needs as they have developed their services as an iterative process over several years. Few local users are asking for significant change and none (except for English Nature) are asking LRCs to adopt NBN standards or share data through the NBN Gateway. In contrast the needs of national and regional users are less clear.

LRCs accept that future development of the LRC network must be user-led. Currently however, there were no national users with a clear view of the services required from LRCs and no funded projects to back them up. There is resistance to change, but given many LRCs have not yet built a stable long-term funding partnership, there was recognition that change in the nature of LRC services and perhaps their organisational structure would be required if significant national funding became available. Most felt that the NBN initiative was an opportunity to further develop the LRC network but that the opportunity had not yet been realised and followed through with sufficient drive (and resource) from national users.

The LRCs universally welcomed the fact that the NBN provided a framework of standards and tools to support data sharing. Consistency of approach between LRCs was a critical part of the Pilot Project and valued by all LRCs. Nationally agreed advice and the provision of standards and tools such as the licence agreements was strongly supported.

The LRCs welcomed the opportunity provided by the Project to reconsider business models and the long-term future of LRCs. All recognised that more strategic thinking in this area was needed.

Working with volunteers

All LRCs recognised the value and importance of maintaining active relationships with the local recording community. It is a resource-intensive area of work and all LRCs reported a large shortfall in staff resource available to co-ordinate and support voluntary recording. Often LRC funding partners were not willing to fund work with volunteers, being more interested in outputs and services. It is a challenge for LRCs to adopt a more business-like approach and find a way of building in the costs of volunteer support into the costs of their services and products.

LRCs have invested a significant amount of time in building trust with recorders and recording groups. When the majority of recorders were questioned about data exchange issues they were happy for the LRC take a lead on these decisions – this demonstrates the trust that has been built up as well as the general willingness for recorders to make their data available. Some recording groups and individuals could be difficult to work with or be idiosyncratic – this posed significant challenges for LRCs – the solution was building **mutually beneficial** relationships. This approach also requires continuity of LRC staff, which continues to be a problem.

Volunteers were reported to be generally negative or at best disinterested in the NBN initiative. Again, the common perception was that at a local scale the LRC meets their needs and the added value of a national service is not recognised.

LRC business models

This section covers the work undertaken by the seven Local Records Centres in SW England in relation to LRC Business Models through the SW NBN Pilot Project. More detailed reports of work undertaken over a 2-year period are available (http://www.nbn.org.uk/swpilot).

Key findings

1. The seven LRCs in Southwest England are all working essentially to the same business model of using service level agreements with public bodies supplemented by ad-hoc project work and charging for data requests from commercial agents.

2. The business model is far more standard across the LRCs than the legal entities under which they operate; these vary widely.
3. The common business model evolved independently in the seven counties through the 1980s and 1990s, shaped by economic forces and the needs and capabilities of the key stakeholders.

4. The common business model has allowed the LRCs to meet most of the needs of biodiversity information users in the region.

5. The common business model evolved before the NBN developed. It has remained essentially unchanged through the period of the Southwest Pilot project.

6. The widespread interpretation of data exchange principle 7 (that it requires most biodiversity data to be in the public domain and made accessible to users without

charge at the point of use) would, if fully implemented, represent a fundamental change to LRC business models.

7. A key change arising from the data uncharged at point of use NBN model would be the loss of income that LRCs currently generate from the private sector for helping to sustain biodiversity information services. This income, primarily derived from developers through consultants, currently amounts to some *£112,000* per annum in the SW region, covering *11%* of LRC running costs; this would correspond to around £1 million p.a. for a full network of LRCs in the UK.. No alternative means of obtaining income from the private sector has yet been proposed by the NBN; this sum therefore represents the minimum cost to LRCs of the NBN model.

8. A wider concern arises from the potential negative effect of the NBN charging model on LRCs' ability to secure SLAs with organisations for information services. None of the LRCs in the SW Pilot has secured additional SLAs with significant levels of fees during the SW Pilot, unlike in the previous three years. In at least one negotiation the development of the NBN was cited (misguidedly) as a reason for not entering a SLA.

9. The LRCs in the region, aside from the welcome injection of additional resources through the running of the SW Pilot project itself, have not benefited from the NBN culture in terms of business viability and may have suffered some damage from it.

10. The SW LRCs are strongly supportive of NBN in principle but concerned about their business viability under the NBN charging model as it is currently being interpreted. A consensus has emerged through the workshops held on the issue during the pilot project on a preferred way forward.

Scenarios

There are three possible responses to the issues raised.

1. Ignore the issues.

2. Revise Data Exchange Principle 7 to provide clearly for charging commercial users and provide the means through the Gateway Access controls to have different arrangements for SLA holders and other users in perpetuity.

3. Work towards an alternative business model that all LRCs will be able to sign up to at a defined future date.

Recommendations

The LRCs in the SW Region strongly recommend Scenario 3 (on a majority of 6 to 1; the other, BRERC, preferring Scenario 2).

1. NBN and LRCs should agree an objective of moving towards a point in the future at which LRCs business models will switch from the present model to a new model.

2. The new model is for a guaranteed funding base from government, in all of its manifestations, that both buys LRC services to government, including its central and local agencies, and puts data into the public domain, wherever possible, via the NBN.

3. The new model retains scope for local initiative, distinctiveness and responsiveness to local user needs in LRCs, including the capacity to make charges for value added services.

4. In the interim period (perhaps 2 to 3 years) the NBN tools, including data access provision through the Gateway, provide for LRCs to recover some costs from selected users. A default access position of providing public access to 10km resolution data and maximum precision data to SLA holders has been agreed by the LRCs. This will allow rapid population of the Gateway with LRC datasets while maintaining LRC business viability in the transition.

5. NBN partners should act collectively to support the business case for LRCs.
6. The NBN and LRCs should consider alternative means by which the private sector can contribute fully and fairly to the biodiversity information process.

7. Further investigation is needed to assess whether the alternative business model has implications for the legal entities under which LRCs operate.

8. NBN partners support the case for statutory backing of LRCs.

The new business model for LRCs will require explicit backing and resource commitment by central and devolved government, including critically Defra, the Office of the Deputy Prime Minister, the Welsh Assembly and the Scottish Executive.

Working with Voluntary Recorders and their National Organisations

Introduction

This section outlines the main activities undertaken in the project with regard to National Schemes & Societies and captures some key lessons from this experience. It makes a series of recommendations that should influence future work with this group of NBN partners.

Aims

The project set out to:

- Make species data more accessible through working in partnership with voluntary recorders.
- Identify how NBN approaches could help voluntary recorders to collect and manage data in ways that maximise its benefits to nature conservation.
- Define existing relationships between voluntary recorders and Local Record Centres and data users and identify best practice.

Our approach

This comprised several strands of work, the most significant of which are listed below:

Improving access to existing species records

- We worked to improve access to existing species records via Local Record Centres and Biological Records Centre, Monks Wood.
- Accessing data held by other partners to the project (eg English Nature).
- Direct liaison with National Schemes and Societies.

Identifying best practice and improving data flow

- Data flow modelling between Butterfly Conservation and Dorset Environmental Record Centre.
- Establishment and testing of standard agreements for BSBI and Local Record Centres.
- Developing a Data Access Policy Statement with the Herpetological Conservation Trust.
- Scoping existing relationships between LRCs and local voluntary recorders and identifying best practice.

How successful were we?

Making species data more accessible

LRCs mobilised a significant amount of species data that met the needs of the partnership. They concentrated on mobilising existing electronic records. In some cases, lack of clarity in whether the LRC had authority to put the records on the NBN Gateway meant that consultation with the original recorders was necessary.

A significant amount of existing data from BRC was already on the NBN Gateway. When the list of 'priority' species was provided to them it quickly became apparent that extracting this subset of species would cause problems in some cases, as the data was often paper-based. In this respect the BRC has suffered from the same problems as LRCs and National Recording Groups in that there is a growing mountain of paper-based records. This reflects the lack of a user focus in this area and hence poor resourcing in the past.

Another problem was variable data structures. Recorders tend to collect and index their data by 'sites' rather than species. Without knowing the sites where a species occurs it can be difficult to develop a species-specific dataset without electronically capturing all the data held. This severely constrained access to data held in paper form. Ultimately the solution to this problem lies in encouraging recorders to capture data electronically or ensuring there is an individual or partner organisation in place to provide this service. Encouraging recorders to adopt Ordnance Survey six-figure grid-referencing as a standard method for geo-referencing records would also significantly help in maximising the value of the data for nature conservation purposes.

National Schemes and Societies were contacted directly where the data was not held locally or via BRC. In many cases (eg BSBI, HCT) a lack of dedicated staff resource coupled with a 'skills-gap' in data management issues severely constrained the amount of data that could be made accessible quickly and within the time-frame of the project.

Testing standards and tools and developing existing working models

The data flow modelling work conducted between Butterfly Conservation and Dorset Record Centre was very successful at clarifying roles in the data management and provision process. This work is reported elsewhere in this report (Part 2). It provided a useful basic model on which other partnerships of this type might usefully build. The roles of the partners were identified as follows:

- Butterfly Conservation (local branch) – data collection, data entry and collation to master dataset, data verification, specialist interpretation for local users.
- Butterfly Conservation (national) – national data collation, data analysis and interpretation at national scale, provision to NBN Gateway, development of national and regional products.
- DERC (LRC) – collation of data from sources outside BC volunteers, provide integrated data provision service and simple interpretation to local users.

Butterfly Conservation and DERC agreed this as a viable working model, and relevant licence agreements have been drawn up that facilitate improved access to the data locally and

nationally. Although this may work for this partnership, it is important that every recording group may have slightly different needs and requirements of their data. This may require a different approach.

The work between Cornwall & Isles of Scilly Environmental Record Centre and BSBI looked at similar issues. Again an agreement has been set up clarifying the roles of the LRC and local plant recorders. This focuses on ensuring that each partner benefits from the agreement.

- BSBI Vice-county recorders – data collection, validation, verification, creates master database for Cornwall & Isles of Scilly; provides copies of this to BSBI nationally at regular intervals.
- ERCCIS – collates records from non-BSBI sources, validates records captured in LRC and provides to BSBI VC recorders, uses a copy of the master dataset in data provision service to local users.

The Herpetological Conservation Trust (HCT) has made significant progress in enhancing access to reptile and amphibian data. This has been achieved by appointing a partnership-funded post to collate and manage data. HCT has:

- scoped existing datasets held internally and externally;
- developed data exchange agreements with data contributors;
- developed an organisation generic access policy statement;
- developed a database that is consistent with NBN standards;
- establish a programme of data capture to the new database,;
- provided some of this data to the NBN Gateway.

Before the data manager post had been established HCT had a large volume of data, most of it on paper. Few had access to this valuable body of information. The significant progress made by HCT shows how cost-effective placement of skilled staff resource in National Recording Schemes can be.

HCT are developing a model whereby they collate data records from a range of local and national contributors (including LRCs), verify it and then provide access to the data via the NBN Gateway according to the NBN Data Exchange Principles.

Before and during the project LRCs have been providing a valued service in collating species data from a range of local sources. These include:

- local interest groups that are unaffiliated to a National Recording Scheme;
- surveys conducted by local consultants on the behalf of local planning bodies;
- surveys conducted by other local conservation organisations (eg Wildlife Trust, English Nature).

In addition to collating these data, they also train recorders in electronic data capture and management and conduct a significant amount of data capture themselves where resources allow. This contributes to making the data more accessible and the numbers of records

provided by LRCs during this project (Part1) illustrate this. However, as with other data custodians, resource constraints on LRCs often mean that significant backlogs of data develop.

Captured and paper-based data may then be provided to local or national recorders for verification and subsequently used in broader contexts (eg used by a national recording scheme to produce a national Atlas).

Local recorders valued these services, and the additional data provided to National Recording Schemes can be very significant (eg in the case of Butterfly Conservation). The ability of LRCs to provide an 'integrated' service to users is also highly valued.

What have we learnt?

Across all the potential data contributors, the following issues were perceived to be most significant in constraining progress:

Issue: Data exchange policy

- Lack of clarity as to who has authority to decide data exchange policy for datasets or individual records (eg English Nature, SERC, BSBI).
- In general volunteers were happy for their records to be used for 'not-for-profit' nature conservation purposes and were unlikely to constrain access to such users (eg HCT).
- Volunteers were concerned about providing unconstrained access to species records considered 'sensitive' for nature conservation reasons.

Solutions

The Project has shown that application of the NBNT information management approach can help to clarify authority over data. Whilst the techniques are there the resource to apply them is often not. This requires commitment from the groups concerned and adequate resource support from users. For some time the NBN Gateway has provided a mechanism for managing access to sensitive species records. The key issue is that this functionality is poorly understood and many contributors do not know it exists this perceptions prevents many from exploring the potential for sharing data via the NBN Gateway.

Issue: Technical/skills – data capture, provision and use

- Lack of understanding of NBN standards coupled with a perception that NBN data standards would be difficult to attain (eg BSBI, HCT).
- No consistent data management process between counties or nationally. Few national databases existed (eg HCT) and little if any current metadata was in existence.
- Much of the existing data collected by volunteers does not meet the needs of national users – lack of consistency and variation in recorder effort cause interpretation problems.

Solutions

There needs to be a sustained attempt to improve the data custodianship skills and resource available to Voluntary Recording Groups. The only services that currently exist are the support provided by LRCs to local groups (which may or may not be linked to national recording schemes). The Biological Records Centre at Monks Wood has provided elements of this service to some national schemes. The resourcing of this operation is currently not sufficient to provide even a basic service to all schemes.

The work to build the HCT's capacity in this regard is a good example of how resource targeted towards National Schemes and Societies can derive significant improvements in data quality and accessibility. The BTO is the best example of a well-established custodianship service. This model could be replicated elsewhere, but needs to be driven and resourced by clear user requirements.

Data custodianship needs to encompass survey co-ordination and development of more consistency nationally. The ability to identify data gaps and proactively fill them through co-ordinating the efforts of voluntary recorders will be key if the needs of the national users are to be met in the longer term. The work undertaken by BRERC and other LRCs in the project and the work of British Trust for Ornithology (for example arranging 'recording expeditions' to collect data in under-recorded areas) nationally has shown that this can be achieved in a cost-effective way.

Issue: Resources

- Concern that more open access to data would compromise one or more partners' financial positions (eg Butterfly Conservation, DERC).
- Lack of staff resource devoted to data management tasks and data provision (eg English Nature, LRCs, BSBI).
-

Solutions

LRCs and National Schemes play complementary roles in collating and managing access to data. Their services need to develop together in future. The section titled 'After the Pilot' considers ways in which this could be achieved.

Resourcing of support services for voluntary recording needs to be seen by biological data users as absolutely key to maintaining both species and habitat datasets. Given the data is collected at no cost to the user, targeted investment in collation and management services can be a cost-effective means of securing new data. Voluntary recording can also be directed towards key nature conservation priorities if co-ordinated properly. Business cases need to be developed by a range of partners with a need for this information. The JNCC and country statutory nature conservation organisations have a key leadership role here.

Issues: Benefits and relationships

- A common question raised was 'What's in it for the recorders?' Few could visualise the benefits, although the data capture/management costs were obvious.

- The ‘NBN’ was very often perceived as a distant ‘faceless’ organisation that was irrelevant to the needs of local recorders. The key organisations for voluntary recorders were their local recording group and/or the Local Record Centre. There was a resulting strong lack of trust in the NBN, national data users and the NBN Gateway.
- Concern that data would not be interpreted appropriately.

Solutions

The NBN initiative is largely driven by national users of biodiversity data. The needs of recorders are rarely explicitly considered and addressed. JNCC has conducted some small scoping studies considering how recorders might use the Gateway, but few projects have been followed through, presumably due to lack of resource and/or priority.

The recorders need to see the benefits of sharing their data through the NBN, both in terms of receiving support services from Record Centres or others and in terms of actually using the NBN Gateway as a tool to support and inform surveillance programmes and species research.

We need to build trust between recorders, data managers and users. Trust underpins almost all data sharing in the NBN. Resource, formal agreements and jointly-run projects can all help to nurture trust and build relationships, but it is interesting to note that once a firm foundation of trust has been built (for example in this project between some local recording groups and LRCs), many recorders felt there was no need for formal arrangements.

Many of the data management tasks required to support data sharing are considered ‘boring’ by recorders. Therefore they never get done. As soon as we make recording more like ‘work’, we risk disenfranchising this important group of data contributors. Again clarifying roles is important and data custodianship work is a role that may be more appropriately undertaken by paid staff.

Lessons from the Voluntary recording summary	
Positive	No significant disagreement with the data exchange principles hence no major policy constraints to accessing voluntary records
	LRCs provide valued service to local volunteers. This is the local face of the NBN for them. Many see no value in engaging in the NBN beyond their LRC.
	Voluntary recording effort can be co-ordinated and targeted towards conservation priorities if the data custodianship function is adequately supported.
Negative	NBN seen as monolithic and irrelevant to the needs of voluntary recorders
	Lack of data management capacity within recording groups, BRC (Monks wood) not able to adequately fill this gap.
	Currently most species data is not recorded in ways that would maximise its benefit to nature conservation. Particularly with respect to geo-referencing and gap-filling.
Key learning point	Understand and meet the needs of recorders. Give them a reason to engage. Develop user-led funding partnerships to secure data custodianship services to realise the value of the data collected.

Habitat inventories

Introduction

During the last three years English Nature has invested substantially in detailed mapping of UK BAP priority habitats in the Southwest. The seven Local Record Centres in the Region have worked as a partnership to deliver regional inventories utilising data from a wide range of organisations. We now have a more consistent and accurate understanding of the distribution of these key habitats than any other region in England. We are able for the first time to look at the regional distribution of habitats in the knowledge that they were mapped using a common methodology, habitat definitions and mapping protocols.

The inventories must not be thought of as a "snapshot" of habitat distribution but rather as a body of information of known quality that should be built upon and improved as more data becomes available.

This section aims to capture the key lessons that we have learned from the process and make recommendations for the future. Key questions include:

- Can the cost of detailed mapping be justified?
- What were the problems encountered in the process?
- What have we learned for the future?

This project was highly innovative and ambitious. In three years the project aimed to:

- develop a mapping methodology (little already existed to build upon) based around using existing data;
- develop and implement a piece of software to implement data capture standards;
- map all the terrestrial habitats in the South-West and deliver regional inventories;
- demonstrate the benefits of such data.

In practice we were successful at achieving all four objectives although the demonstration work is ongoing and the benefits will continue to grow well beyond the 3-year project life span.

The mapping process

The mapping process involved development of detailed mapping protocols and habitat definitions. To aid this process a software tool was developed for English Nature to standardise data capture and attribution. The details are contained in the Technical report (available from the English Nature enquiry service and at http://www.nbn.org.uk/swpilot).

Habitat definitions

The amount of work entailed in producing a set of clear mappable habitat definitions for the habitats was underestimated. It became apparent there was sometimes disagreement on the key parameters of some of the habitats between specialists and that there were a number of

habitat specific problems that were time-consuming to resolve. After validation of the definitions with English Nature specialists we made a judgement to work with the definitions we had rather than invest more time in consulting on the definitions more widely. The timescale of the project necessitated such an approach if we were to develop the inventory products.

The definitions we were using were developed and refined through practical experience of mapping the habitats. This slowed the data capture process as we were 'learning by doing'. The mappable definitions used for the project have been made available in their draft form, and JNCC is doing some additional work on them to develop definitive national guidance. The relevant HAP steering groups need to commit further thought to the definitions process, and it is essential that there is a consistency of approach between habitats.

Key learning points:

- The development of a set of mappable definitions was absolutely crucial to the mapping process.
- There was varying input from English Nature specialists into the process as they gave it varying priority. It is essential that the definitions are further refined and put out to formal consultation.
- Further development of the habitat definitions should take account of the practical experiences of the project, and in particular the views of LRC staff and users.
- There are a number of habitats where more thought is needed about the most suitable mapping approach. A constant issue raised was how to strike a balance between local interpretations of habitats that may not coincide with national definitions. We ensured wherever possible that the definitions and resulting inventories were nationally applicable and consistent.
- Mapping all habitats together forces decisions on the boundaries where habitats and adjacent to one another or found in a mosaic

Working with the LRCs

The habitat mapping involved working with the seven LRCs as contractors with the Project Officer coordinating the work. One of the key challenges was developing a methodology that would work in all LRCs, where there were differences in available data, computer equipment and software, skills and staffing. English Nature employed a flexible approach in contracting the work, being clear about the outputs but allowing the LRCs to identify the best ways of spending the resource to deliver the goods. This meant that in some cases LRC dedicated project officers were employed, in others the work was taken on by existing LRC staff. In some cases capital items such as IT equipment were purchased to enable the work to commence. The Project Officer for the inventories had to respond to regular queries from the LRCs and spent varying amounts of time with individual LRCs reflecting the skills and stage of development of each LRC.

Key learning points:

Communication is vital. Individual LRCs sometimes felt isolated from the habitat inventory development process. A great deal of coordination is required both to capture and

communicate best practice from different contractors and to ensure that evolving methodology is clearly communicated. Establishing a more formal regional 'team' with staff drawn from each of the LRCs and managed as a more co-ordinated unit might have addressed these issues.

Where there was a high turnover of staff within LRCs, more input was required from the Project Officer. In general there were advantages to having dedicated staff involved in the project throughout its length.

The Data Capture Tool, although vital in ensuring data quality, was unreliable to use and produced a number of problems that were time-consuming to resolve and difficult for non-specialists to understand. Only one of the LRCs had a dedicated IT expert on their staff and hence the skills did not exist locally to solve these problems. Although we ran a parallel technical support contract for the software, this was under-resourced and was too remote from where the software was being used. More time and resource should have been put into developing and testing the tool. It is a well-known fact that developing software is always a risky and time-consuming business and this element probably merited at least a year's dedicated work to be done properly.

Was the investment good value for money?

The experience of mapping habitats in the project has demonstrated that through a partnership approach, detailed, regional scale habitat inventories can be successfully produced. The total cost of developing the methodology and the South-West inventories was in the region of £0.5m over the project. The methodology, now developed and tested has been used to develop 23 prototype national inventories (using only a limited range of nationally available sources) at a cost of ca. £250k.

In the South-West these data are proving valuable for a variety of uses from BAP monitoring and reporting, LBAP planning, targeting habitat restoration and regional scale spatial planning. Although a large investment of resources was required to undertake the mapping, the potential benefits could be considerable. Work with Defra RDS has already demonstrated that high quality habitat data can make clear improvements to the efficiency of Agri-Environment scheme targeting; potentially delivering increased biodiversity on the ground and better value for money to the tax-payer. The example of RDS can also be broadly quantified:

- £140m currently spent annually on ESAs and CSS Agri-Environment schemes – this is to increase to ca. £300m on Entry Level and Higher Level Environmental Stewardship schemes.
- The expected annual cost of maintaining habitat inventories (see Part 5 for detail) is ca. £0.5m. This represents less than 0.02% of the £300m investment in AE schemes.
- Taking figures from Defra's own trial, this data will potentially inform on average at least 50% of agreements – and hence ensuring better targeting of ca. £150m of AE spend and delivery of wildlife benefits.

What have we learnt?

- Investment in the development of inventories would not have occurred without English Nature taking an entrepreneurial lead in this area.
- The benefits of the data and leverage potential are beginning to be realised, showing that the risk of investing in development of the inventories was worth taking.
- It is necessary to ensure that contractors have adequate technical (including IT) support and that they have the GIS skill and general IT competence combined with sound ecological knowledge.
- Constant communication and sharing of best practice between all parties is essential.
- The Project would have benefited from improved communication between the LRCs to promote sharing of best practice and encourage standardisation of approach.
- LRCs need continued support to update and manage the growing inventories.
- This Project had strong support and commitment from the LRCs - perhaps beyond that expected from a standard contractor. This was partly because the LRCs saw themselves as 'working partners' and also because they could appreciate the potential benefits of the products themselves. This was important when the Project hit obstacles as the contractors had to help the project officer to develop solutions.
- The inventories must be maintained and kept up to date if the benefits of this investment are to be maintained and fully realised nationally (Part 5 makes recommendations for how this should be achieved).

Building the business case for investing in biodiversity data & information

Introduction

This section aims to capture some of the key lessons we have learnt from actively trying to encourage partners to evaluate and cost the benefits from the NBN. Here we focus on the process of encouraging active participation in the development of business cases rather than making costed recommendations for the programme of work to follow the pilot. That is covered in Part 5 – 'After the Pilot'. We base our recommendations primarily on the Pilot Project but also draw on a wider experience of work with other partners involved in the NBN initiative.

Our key aims were:

- to demonstrate the benefits of the NBN to English Nature and its partners;
- to investigate the costs associated with future development and update of products delivered through the NBN;
- to consider the constraints to future partnership funding of these products and the NBN in general and suggest solutions to these problems.

Our approach

The project set out to develop a series of focussed products through the NBN and demonstrate their benefits to a range of partners. One of the key reasons for working within only one region was to 'fast-track' this product development so that the benefits of the NBN could be realised within a reasonable timescale. These products were:

- regional inventories of BAP priority habitats; and
- regional inventories of BAP priority species (short-list of 25).

These products were identified as priorities by the Project partnership.

English Nature 'pump-primed' the development of these products, providing the majority of the resources to collate together existing information and interpret it. LRCs were contracted by English Nature to do this work on behalf of the project partnership. The inventories were based on existing data, the sources for which were varied. The original investment in this survey information should be recognised, and the original contributors included voluntary recorders, Local Authorities, English Nature, Environment Agency, Forestry Commission, the Wildlife Trusts and other statutory bodies and NGOs.

As these products became available, English Nature offered the services of the Project Officer and a consultant to provide technical advice and facilitate structured evaluation and use of the products by key partners. The detailed work undertaken is documented elsewhere, and encompassed work with Defra RDS, English Nature Area Team staff, Environment Agency and Local Authorities. A range of other partners including LRC users made use of the products and not all of this activity is documented in this report.

We used a range of mechanisms to capture users comments on use of the products, these included workshops, one-to-one meetings and reports.

In addition to the product development we conducted work with LRCs to explore the ongoing costs of maintaining these products and the costs of sustaining a regional LRC network.

How successful were we?

Demonstrating the benefits of the NBN products

The extent to which the partners evaluated and recognised the benefits of the data depended on the extent to which they were willing to commit staff time to explore the application of the data. This also relates to the extent to which biodiversity was a core part of their business. Several examples of how data and LRC services have been used are documented in Part 3 of this report.

- Defra undertook a specific evaluation project with regard to Agri-Environment schemes. Their project report identifies clear benefits from the data accessible via Local Record Centres and the wider NBN.
- A range of local and national English Nature staff have committed time to assess the applications of the data. Clear benefits have been identified through focussed example applications. There was however, unwillingness (mainly due to work pressures) for some South West Area Team staff to engage in the Project until data products were ready for use (well into the 3rd year). This has resulted in a slower uptake and use of the data than expected. A programme of follow-up work has been initiated nationally to secure the benefits more widely.
- The Environment Agency has just commenced a project to undertake a detailed evaluation of the data with a view to underpinning a business case.
- The work with Mendip District Council was led by their Biodiversity Officer, who's post came to an end during the study. This constrained the ability of the Council to engage in the project.
- Cornwall, Dorset and Avon BAP partnerships (incorporating a range of statutory and non-statutory partners and NGOs) undertook detailed evaluations of the data and realised clear applications of the data.
- The range of NGOs and other bodies are starting to make use of the habitat inventories in a range of contexts. The project did not set out to keep track of and document all this activity.

Constraints to partnership working and some solutions

Organisations have different degrees of responsibility towards biodiversity and hence varying commitments to fund biodiversity projects. (eg English Nature compared with the Environment Agency)

Most biodiversity organisations are more likely to fund on the ground delivery than investing in information supply and maintenance (eg RSPB cf Local Authorities). The benefits of a

more informed, targeted and hence cost-effective approach are not widely recognised. This project has provided strong evidence in support of investing in such an evidence-base.

The range of potential data suppliers and the issues surrounding access and use of biodiversity information are complex and developing a funding strategy in this area can be difficult. Few organisations have a sufficient understanding of these issues to develop a sound business case and implementation plan.

Most organisations do not have a clear understanding of their biodiversity information needs, and rarely do they have dedicated staff focussed on biodiversity information collection and use. Knowledge of information development and use is a specialist expertise and it is in short supply in organisations on the fringes of the NBN.

Some solutions

Here we suggest a number of 'best practice' measures that can facilitate and accelerate the rate at which existing and potential NBN partners can develop business cases to develop the NBN further:

A lead organisation fosters a partnership of users around a set of common interests and needs and the partnership develops an integrated business case. This approach was advocated by the CCBR (1995) report. The strongest candidates with existing funding streams to take such a lead role in England are English Nature, Defra and JNCC.

A recurring problem is the reconciliation of local and national interests. For example, at the local level Local Authorities are the most significant funding partner for LRCs and yet there remains no effective mechanism to co-ordinate strategy regionally or nationally. The Planning & Policy Guidance for Nature Conservation (PPG9) for Local Authorities is due for review and this presents an opportunity to reiterate the importance of developing and maintaining biodiversity information as an evidence-base for planning and policy decisions. It is not realistic to expect that the funding strategies of Local Authorities can be co-ordinated at regional or larger scales and hence national/regional funding partners for LRCs will need to develop strategies that are flexible enough to enable local partners to also contribute to, and use, the network in ways that meet their needs.

There will always be a need for individual organisations to commission specific work to meet their individual needs (for example Local Authorities). Even if organisations act independently in meeting their biodiversity information needs, they should be encouraged and supported to comply with the NBN data exchange principles and share their outputs readily through the NBN Gateway. This enables other organisations to realise the benefits of the data collection, and enables a common understanding of information gaps and hence enables more focussed and cost-effective data collection. Unless some technical support is available to facilitate and inform this activity (particularly with partners on the fringes of NBN) it is likely that either the NBN will not be perceived as a viable delivery mechanism (even if it is) and resulting data will not be shared through it.

The first step towards realising the benefits from NBN for any organisation is securing sufficient staff resource to conduct an evaluation of the potential costs and benefits. We believe that the Environment Agency and Forestry Commission are two organisations with considerable biodiversity responsibilities that should be significant funding partners of the

NBN. Both are at a stage where they need to develop evidence-based business cases and hence need to conduct business-oriented evaluations of NBN services. The Defra RDS sub-project has clearly illustrated that improved access to biodiversity data can increase the cost-effectiveness of biodiversity delivery – this potentially holds true for the EA and FC also.

Each organisation needs an individual acting as a 'champion' from **within** the organisation to act as a focus for liaison with the wider NBN partnership.

The NBN Trust could accelerate business case development by establishing a consultancy service for organisations that facilitates the development of needs analyses, evaluation of NBN services and subsequent development of business cases.

The NBN Trust needs to strike a better balance between selling ideas, concepts and long term visions and meeting the operational priorities and needs of the organisations it engages with by delivering viable, robust products and services that are worth investing in.

The NBN can seem complex, chaotic and risky to project managers, particularly so for those not experienced in running NBN projects. The way to manage these risks is to focus on a small part of the user requirements in order to reduce the number of data suppliers and hence, range of issues and complexity of funding streams and partnerships.

Key recommendations

1. Future development of the NBN must be use-led and focussed on delivering products and services that meet core operational and policy needs.

2. Key national users (either independently or in partnership) develop a costed implementation plan that focuses on a few key information products that have the greatest application with their staff and partners**.** These plans should be made available to others to inform their own business case development.

3. English Nature, Defra, Environment Agency and Forestry Commission develop a long-term partnership to maintain BAP priority habitat inventories.

4. All NBN partners funding biodiversity data collection and maintenance work should ensure their outputs are accessible through the NBN Gateway according to the NBN Data Exchange Principles. The NBN partnership should ensure that there are defined processes for doing this.

5. Those partners at an early stage of contributing and using the NBN (eg EA, FC) should first secure sufficient resource to undertake a cost-benefit analysis of its services. Robust evaluations are needed to back up business-cases – we cannot assume that the benefits of improved access to biodiversity information are accepted and adequately valued.

Lessons from supporting business case development	
Positive	The benefits of habitat inventories are clear and widely recognised. This provides a basis for partnership working to maintain them.
	The SW Pilot has generated much more evaluation of the NBN and business case development than would have occurred normally. This is because we have put resource into technical facilitation services.
	Given resource is always limiting; the most persuasive benefits of improved access to biodiversity data are generally those that can make organisations more efficient or cost-effective in delivering their core activities.
Negative	Partners in most cases are at very early stages of business case development and have very limited resource initially to drive forward this work area. It is very difficult to accelerate this externally from the organisation.
	There is no agreed 'model' for how the NBN contributors should work together and their respective roles. The niches of contributors and managers of data are poorly defined.
	The NBN is a very large and complex beast and few understand it sufficiently to engage properly.
Key learning point	Opportunities for funding partnerships exist, but they are currently uncommon. Those that are developed need to be focussed on agreed specific products.
	The NBN should be seen as a mechanism by which data users meet their data needs. The focus therefore should be on their needs and how they can be met, rather than development of the NBN *per se*. The lack of understanding and definition of need is a key constraint.

Summary of the key lessons

The key barriers to increased access to existing data and ensuring regular update are lack of trust between data suppliers and users and inadequate resourcing of data custodianship. Development of data standards and tools can help build confidence but it is not sufficient alone to remove these barriers to access.

The NBN Gateway is not focussed on specific requirements and hence currently risks not meeting any needs sufficiently.

The NBN initiative and the NBN Gateway specifically are seen as distant and irrelevant to local suppliers and users of biodiversity data. These are the key contributors of data to NBN.

The Southwest LRCs have proposed a new business model to sustain development of the LRC network and ensure full integration into the NBN. This depends on core funding from Government sources, more consistent funding from Local Authorities and maintaining existing service level agreement contributions.

An interim position has been agreed, whereby the LRCs will upload datasets to the NBN Gateway and provide public access at 10km resolution and full access to Service Level Agreement holders. As a more sustainable funding position develops more open access can be considered.

In order to fully engage National Voluntary Recording Groups and realise their potential to deliver high quality regularly updated datasets, we need to build mutually beneficial partnerships. Organisations wishing to use these data must inject resource to build data custodianship capacity in these groups.

The investment in the development of habitat inventories is starting to generate significant leverage in excess of the initial investment. This added value will only be realised in the longer term if they are regularly updated.

Only a small number of organisations are at the stage where a strong business case exists for investment in the NBN. The NBN Trust and its supporting infrastructure must be co-ordinated and focussed on developing these opportunities.

Part 5 Next steps

Introduction

This section aims to turn the lessons learnt from the Project into a strategy for how inventories could be developed and maintained in the future. The section focuses on 2 key aspects:

- Developing inventories as a key product of NBN
- Enhancing data custodianship capacity as a key underpinning service for inventories

National inventories – a key product from NBN

One of the key drivers for future development of the NBN must be to support the development of key data and information products that support policy-making and implementation. The UK BAP is the key policy area currently constrained by lack of information. This project has shown that partnerships with LRCs and Voluntary Recording Groups using the NBN framework can develop inventories of priority habitats and species. These inventories enable targeting of action on the ground and provide a sampling framework for assessing outcomes, both of which are vital to the formulation and delivery of nature conservation targets.

In order to take the next logical step towards establishing a viable monitoring programme for the UK BAP, national inventories of key habitats and species need to be established and sustainable programmes put in place to regularly update them. This should be the next key priority.

In order to deliver inventories that are fit for purpose in a cost-effective way, we must make full use of data collected for other purposes. The NBN provides the framework of standards and mechanism for collating data from several sources.

Data custodianship

Given that the most cost-effective way to develop and maintain inventories is thorough collation of existing data then the current data, gaps in data custodianship must be filled.

A data custodianship service would comprise the following key tasks:

- Maintain and archive previous versions of the inventories.
- Provide metadata and advice on interpretation of the inventories.
- Define and implement data exchange policy for the inventories.
- Collate new survey information collected by others and user feedback and use these data to update the inventories.
- Make the data accessible under the NBN data exchange principles and promote effective use of the inventories.

In addition, custodians could identify gaps in the inventories and help target new survey effort where resources allow.

If adequately supported and resourced, the inventories could become one of the key products of the NBN partnership in England. In addition to securing a custodianship service for the inventories, the basic underpinning technical infrastructure of the NBN (eg Gateway, software tools, skills transfer) needs to be adequately resourced and sufficiently focussed to support the maintenance, delivery and use of the inventories.

BAP Priority Habitats

We believe the most realistic scale at which to develop habitat inventory programmes is at country level. This does not preclude other countries developing complementary programmes.

In England, English Nature has pump-primed the development of priority habitat inventories both within the Southwest region and nationally through the Nature On-line project. The national inventories that now exist need to be maintained and updated otherwise they will quickly become redundant.

Although slightly different data sources and strategies will be required for different habitats, our experience indicates that the following key assumptions hold at least for all terrestrial habitats:

- A national service is required to promote and develop standards and co-ordinate inventory maintenance.
- A standard set of habitat definitions and data capture approach must be employed to enable national collation and informed use of the inventories.
- Whilst some inventories will benefit from remote sensing data, locally resourced and conducted survey combined with user feedback (particularly from land managers, advisors and regulators) are the most important sources for new data.
- Local validation of nationally derived inventories is important to ensure they are accurate and fit for purpose.

The costs of maintaining the inventories depend on the strategy employed and the update cycle required (eg update annually, 3 or 5 yrs). Table 5.1 outlines some indicative costs for maintaining the inventories based on experience of our work in the Southwest and nationally. This is not a short term (3-5 year) project - it would need to be a rolling data maintenance programme resourced into the foreseeable future.

Our estimate of the data maintenance and update cost is based on the distribution and abundance of BAP priority habitats as presented by the Natural Areas framework. This costing is indicative only and covers the cost of maintaining existing inventories not developing new ones. A more detailed costed implementation plan needs to be developed by the relevant funding partners.

Table 5.1. Indicative costs of maintaining the habitat inventories through each update cycle by Region. Three options are presented for updating the inventories (annually and every 3 or 5 years) – the figures relate to annual cost.

		Annual cost (£k)		
Region	**No inventories**	**Annual**	**3 yearly**	**5 yearly**
East Midlands	21	140	47	28
Eastern	19	162	54	32
North East	21	83	28	17
North West	26	173	58	35
South East & London	20	239	80	48
South West	26	292	97	58
West Midlands	19	128	43	26
Yorkshire and the Humber	25	113	38	23
National co-ordination		100	80	60
Grand total		1429	523	326

A small national team comprised from staff from different organisations could manage this programme. The national team would develop and promote standards for data capture and co-ordinate and manage the update cycle. The minimum staff complement to manage the national programme (assuming a 3 yearly update cycle) are estimated to cost ca. £80k/annum and would secure:

- a programme manager to manage regional contracts and liase with funding partners;
- two data officers to liaise with contractors to transfer skills, promote standards, conduct quality assurance and promote access and use of the inventories.

The Southwest project has shown that the regional approach is a practicable scale at which to manage the custodianship service. The data maintenance and update would typically be carried out through eight regional contracts. This strategy would provide the flexibility for regions to work together where appropriate, and enable different mechanisms for delivery to develop in each Region, taking advantage of regional opportunities and the unique existing range of custodians in each region.

We expect Local Record Centres to take a lead role in delivering these contracts but they will need to form functional regional consortia and propose innovative solutions to how the inventories can be maintained where there are current gaps in the LRC network. We envisage that some national and regional organisations, including National Voluntary Recording Groups may also be in a position to contribute to delivery of this work.

Establishing this core national and regional service would enable national and regional partners to capitalise on the significant ongoing investment in habitat survey by local partnerships, which is currently untapped beyond the local scale.

Our recommendation is that a 3 yearly update cycle would be achievable and deliver data fit-for purpose at local, regional and national levels. This programme would cost approximately £523k per annum.

No single organisation is in a position to resource this programme fully. The habitat inventories are a product highly valued by several national partners and we believe that potential lies in a consortium approach to resourcing the programme. Specifically, we recommend that English Nature, Defra, Environment Agency and Forestry Commission develop a funding partnership. This partnership will need to engage regional and local funding partners (particularly Local Authorities and Regional bodies) to maximise cost-effectiveness of the programme.

The formation of a new integrated rural delivery agency in England does introduce some uncertainty for the future, but the UK BAP will remain a conservation priority and therefore the need for this information will be sustained. We believe the integrated agency enhances the opportunities and strengthens the arguments for greater cooperation and development of funding partnerships.

Species inventories

For those species on the UK BAP list and listed under the Habitats Directive we advocate the development of species inventories. This form of inventory fulfils the same purpose as the habitat inventories in that it provides basic distribution and abundance information that can inform conservation activities and also forms a baseline against which change can be measured.

The project has begun to explore best practice and the mechanisms that could underpin the development of species inventories. However, the future mechanism and hence costs are currently less clear than for habitats.

Here we propose a process for achieving greater clarity of need and the mechanism for meeting those needs. We believe there are some key principles that have emerged from this project and elsewhere. This is an area where UK-scale co-ordination would be of benefit and has occurred previously. There is clearly a role for JNCC to support coordination of this programme.

There is a need for national collation and interpretation services and these are best organised by taxonomic group. This does not preclude some groups amalgamating if appropriate and economies of scale can be realised. The existing framework of National Schemes and Societies are the foundation from which this service should be built.

Data custodianship is generally poor with these groups and no existing schemes are developing adequate inventories and sample-based programmes except for birds. The best mechanism for building capacity in these data custodianship services is currently uncertain and may well vary with each species group.

We recommend that the following steps be taken to identify the most cost-effective and realistic approach to delivering species inventories:

- JNCC and other key potential users of the inventories clarify their requirements and the key tasks that data custodians would need to undertake to develop and maintain inventories.

- Users (ideally collectively) identify a short-list (less than 5) of taxonomic groups as priorities for initial inventory development.
- The users, relevant National Schemes and other key stakeholders (eg National Federation of Biological Recording, Centre for Ecology and Hydrology) engage in a dialogue over the options listed above – focussing on the option or combination of options that is most likely to deliver a cost-effective, sustainable programme within an acceptable timescale.
- The users and other relevant partners collectively resource the development and maintenance of the programme.

Once a clear option can be identified a better estimate of costs can be made and key partners should consider whether there is potential for joint working.

Once these inventories have been developed, sample-based monitoring can be established to assess trends and enable better reporting against BAP targets and Favourable Conservation Status. This ultimately needs to be run alongside broad scale surveillance in more common and widespread species (eg the Breeding Birds Survey and Atlas type information) to identify emerging priorities.

Supporting development of the network of custodians

The majority of habitat and species survey conducted is collected locally by either individuals or organisations operating at that scale. Regional and National organisations have difficulty in accessing and using this data unless there is a defined mechanism for collating and making the data accessible. The maintenance of habitat and species inventories depends on there being adequate data custodianship at local scales.

This project has shown that at local level LRCs deliver a range of valued services to their users. **We have also shown that a regional network of LRCs can provide a custodianship service for habitat and species inventories and deliver valued datasets to agreed consistent standards. Much of this delivery has been dependent on effective partnerships with volunteers**. This was the model that we set out to test in the Southwest project.

Their key constraint from a national perspective is that there are many gaps in the LRC network. Approximately half of the counties in England do not have a functioning LRC and many existing LRCs do not have a sustainable funding position beyond 1-2 years.

Very few National Schemes and Societies have sufficient data custodianship capacity to meet the needs of their own members let alone those of the wider conservation community.

The key problem is that the value of data custodianship is poorly recognised. Current funding partners pay for outputs and services, not data collation and maintenance. The following actions need to be taken to support development of the ‘network’.

LRCs and other data custodians need to be much more open and explicit about the costs of delivering services and share these more openly with funding partners. There should be no ‘hidden costs’.

Much more needs to be done to demonstrate the value of improved access to biological information. This project has set out to do this and much activity is still ongoing in this regard. A separate section of this report covers this. In particular Local Authorities and some national organisations need to be targeted in the future.

The Office of the Deputy Prime Minister and Defra should send out clear messages about the importance of up-to-date biological information as the evidence-base for all decisions affecting nature conservation. Most importantly we have demonstrated that this information is necessary to enable cost-effective delivery of nature conservation policy. The imminent revision of PPG9 provides an important opportunity to do this.

LRCs and other data custodians need to review current and proposed practices to ensure they are efficient. Currently there are far too many examples of data management tasks being replicated in several different locations. This is replication of effort and a luxury we can ill-afford. In developing data their data custodianship capacity, National Voluntary Recording Groups should focus on drawing benefit from, and contribute to, existing LRC services.

Part 6 Conclusions

The detailed conclusions of this project are contained within Parts 4 and 5 of this report. A set of recommendations are listed in Part 7. This section aims to step back from the detail and reflect on the extent to which the project met its objectives, the key constraints to development of the NBN and makes some observations on managing projects of this sort.

The project aimed to test whether the NBN could deliver useful products that make a real difference to the delivery of nature conservation. We believe we have demonstrated this in several contexts and with different partners. The inventories will substantially enhance the process of delivering biodiversity targets in the wider countryside. Most importantly they will enable partners to target activities and hence significantly improve the cost-effectiveness of existing programmes and also assess whether the required outcomes are delivered.

One area of the project that has had variable success across partners is the uptake and use of the data. English Nature was not in a position to require partners to use the data and this activity developed at the pace that each organisation was able to operate. That said, some key projects undertaken by English Nature, Defra and LBAP partnerships have shown real and tangible benefits. These projects are now acting as 'springboards' for others to undertake similar studies (eg Environment Agency). The work the partnership has done in relation to Agri-environment schemes most effectively demonstrated that a relatively small investment in inventories and associated outcome monitoring can enable a much more targeted approach to BAP delivery. The investment in inventories therefore enables significantly enhanced delivery of biodiversity targets within current resource levels for on-the-ground delivery.

The maintenance and update of inventories can only be cost-effective if delivered through the NBN. The single most important source for updating inventories is the data collected by others (predominantly at local levels) for a range of purposes, and this needs to be shared through the network in a consistent way so that it can be incorporated into the inventories.

The key obstacle to this happening is the crippling lack of resource applied to data custodianship across the board. This applies to English Nature and other national bodies as much as it does to voluntary recording groups and Local Record Centres. Sustainable data custodianship services need to be established that can fill this gap. This capacity building should not be supported in an unfocussed way; rather it should be focussed on delivering key products and services, such as inventories. We believe the most realistic scale at which to develop a national data custodian network for England is regional. This will mean that existing custodians and data users will need to rise to the challenge of adapting working practices and develop more flexible ways of deploying existing staff and financial resources spent in this area.

For example, when considering how to service a requirement for regional habitat inventories, county-based LRCs will need to consider how they might fill gaps in the LRC network, potentially expanding the scale of their service. When National Voluntary Recording Groups are considering developing their custodianship capacity we recommend they build upon the existing fragmented network of LRCs rather than replicate activity. We would like to see custodians focussing their resource on the data collation, update and interpretation role and realising opportunities to employ the Gateway to automate routine reporting tasks as a means of improving efficiency.

We also tested the working standards and models promoted by the NBN Trust, including the Gateway. This proved to be a mixed bag of successful and valued products (some of the data access products) and some elements poorly understood with the value of them not recognised (the Gateway). Many of the data access standards and tools were welcomed though application could be time-consuming. Partners felt that their application needed to be targeted towards situations where benefits were greatest.

The misunderstanding surrounding the Gateway endures in the Southwest, even though they have been the focus of much activity by NBN officers. The Gateway has been promoted for some time as potentially delivering data to meet the needs of all. This is patently not the case, and if the Gateway is to become a viable operational tool it must focus on key audiences. We believe this should be national and regional users and data contributors who ware likely to use the Gateway as a key delivery mechanism for collating and reporting data managed by the data custodian network. This must include the needs of voluntary recording groups.

The NBN initiative is held back by problems of communication (mixed messages and perceptions and poorly managed expectations), co-ordination (complexity of partners involved in delivery of a given output) and lack of resource. All of these conspire to degrade levels of trust between data contributors and users. Trust is the bedrock upon which data exchange and the NBN initiative is built. Improved focus on products and services would help alleviate many of these problems; such focus needs to be accompanied by adequate resource for data custodianship.

Managing the South West Pilot Project was challenging. A large number of partners were involved, and many were not formally contracted to English Nature to deliver outputs. This introduces considerable risks to project delivery. A fundamental truth about partnership is that there is nearly always compromise on either or both sides. In hindsight, the project should have reduced the scope of its objectives and focussed even more from the start. This is a key lesson for any NBN project.

One major constraint to progress was that there we had no project methodology defined at the start. The project needed to develop methods and then test them, as well as deliver the inventory outputs. This pump-priming work now means that future projects can start further down the road, the national habitat inventory work being a good example. The fact that the project has delivered against its objectives is largely due to the commitment of those involved and the fact that there was continual management of risks, focussing and evolution of the project as it progressed.

The approach of running a pilot project to explore the NBN was very successful. The NBN was at a stage where LRCs and others perceived the NBN to be a threat. There was strong resistance to change. The project has provided an environment in which partners can ‘dip their toe in the water’ without committing to anything longer term. This approach encourages innovation and risk-taking which was necessary to deliver the outputs and benefits the project has realised.

Part 7 Recommendations

This project has tested several key elements of the NBN. The NBN has the potential to meet the future needs of the partnership to develop, maintain and use inventories as well as other needs. The following 17 'headline' recommendations are considered key to the future success of the NBN and to the future development of habitat and species inventories as key NBN products. They are directed at specific partners or groups within the NBN.

NBN Trust
Recommendation 1. The NBN Trust should offer a 'consultancy' service that can provide technical support for the evaluation of NBN services and development of business cases by its partners.
Recommendation 2. The NBN Trust should give high priority to the task of providing regular updates of ongoing or new projects and opportunity for dialogue with LRCs and Voluntary Recording Groups. The NBN Trust should develop a communication plan and regularly monitor the effectiveness of this plan.
National Government Organisations
Recommendation 3. National and regional users of the NBN should undertake business-led evaluations of the NBN as a prelude to development of business cases for investment. (eg akin to the RDS study)
Recommendation 4: English Nature, Defra, Environment Agency and Forestry Commission should develop an England-scale partnership to maintain habitat inventories and develop sample-based monitoring programmes from these.
Recommendation 5: JNCC should more pro-actively co-ordinate species surveillance at UK scale. This should involve greater co-ordination of funding partners, identification of needs and phased investment and development of species data custodianship.
Recommendation 6. Existing or potential national funding partners of LRCs (English Nature, Environment Agency, Defra and Forestry Commission) should use the national LRC Co-ordination project to identify overlaps in service requirements and develop more co-ordinated funding strategies. These must complement and build upon existing inputs made by Local Authorities and Regional partners.
Recommendation 7. Defra and ODPM should use the opportunity of revising PPG9 to reinforce the importance of maintaining an evidence base for nature conservation decisions at local and regional levels.
The NBN Gateway Team
Recommendation 8. The NBN Gateway needs a communication and training plan and should monitor and regularly review the effectiveness of this.
Recommendation 9. More focus should be placed on delivering a comprehensive, robust Gateway service to meet specific operational applications. This must be adequately resourced with contributions from users.
Recommendation 10. A set of service standards should be defined and processes implemented to ensure user feedback is acted upon.
Standards & tools
Recommendation 11. The NBN Trust should place greater priority on training data contributors and users in the use of its standards. It should develop an adequately resourced communication and training plan and monitor and review the effectiveness of this.
Recommendation 12. The implementation of standards and tools should be targeted towards those applications that would most benefit from their adoption.

LRCs & Voluntary recording
Recommendation 13. Resources permitting, LRCs should develop functional regional networks in partnership with voluntary recording groups in order to maximise the opportunities to service regional and national user requirements and hence draw on this source of funding. Where gaps in this network exist, existing LRCs should consider the option of expanding the geographical coverage of their service.
Recommendation 14. Resources permitting, voluntary recording groups and LRCs should evaluate how the NBN standards and tools can benefit their data collection, management and dissemination activities. The focus for this should be improving efficiency and enhancing data access and use.
Recommendation 15. When developing their data custodian capacity, National Voluntary Recording Groups and LRCs should build on existing capacity (ie draw contributions from each other) in order to maximise cost-effectiveness and sustainability of both parties.
Recommendation 16. Funding partners need to establish mutually beneficial partnerships with Voluntary Recording Groups.
Recommendation 17. LRCs should ensure that they are entirely open about the costs of delivering outputs and services. This includes factoring in currently ‘hidden costs’ associated with supporting data collation and maintenance.

Annex 1. Summary of expenditure against project objectives

Costs are total project cost over three years in £k and refer to English Nature expenditure. Reference is made to significant partner contributions.

Objective	Sub-projects	Cost	Contractor or Partner	Output
3	Habitat Inventories – SW	499	LRC (EA, FC data)	LRC regional data audit. Habitat definitions and inventory methodology. X regional inventories for grassland, woodland, upland and some maritime habitats.
3	Habitat monitoring	64	Consultancy	Piloting of national outcome monitoring survey for 5 grassland priority habitats
3	National data sources to support habitat inventory development	25	NSRI, BGS, CEH	Consultancy on soils and geological datasets. Licences for Soils and Land Cover Map datasets.
2	Species data – LRC	63	LRC (other partners data)	LRC data mobilized for 25 priority BAP species in SW plus additional LRC datasets.
2	Species data - NSS	79	Voluntary recording groups	Scoping partnerships, establishing co-ordination capacity with LRCs and Marine Biological Association, initiating 1 pilot long-term partnership with HCT. BC and HCT contribution of data to the network.
1	NBN membership	42	NBNT	Membership fee to NBN Trust – support for NBNT core functions – national influence over NBN strategy
1	Testing NBN approach	56	LRC	Feedback from LRC on NBN standards and tools. Analysis of LRC funding models.
1	Technical development	75	Consultancy	Development of EN website and NBN gateway to meet EN and partner needs. Development of Recorder and training to meet EN/LRC needs
1	Technical advice & support	23	Consultancy, JNCC	Technical support for partners on data contribution and use
4	Evaluation and business case development	86	LRC	Evaluation projects with key partners – ongoing. Defra contribution of £65k. Business cases with key funding partners.
	SW Pilot Total	**1013**		
All	SW Pilot Project management	1.5 FTE annually	EN	Project reporting. Support for partner business case development.
Nature Online	Habitats Inventories – National programme	265	FC, EA, consultancy	X national prototype inventories for grassland, woodland, upland, wetland, and coastal habitats
Nature Online	Programme management	1.5 FTE	EN	

Annex 2. Biodiversity information toolkit

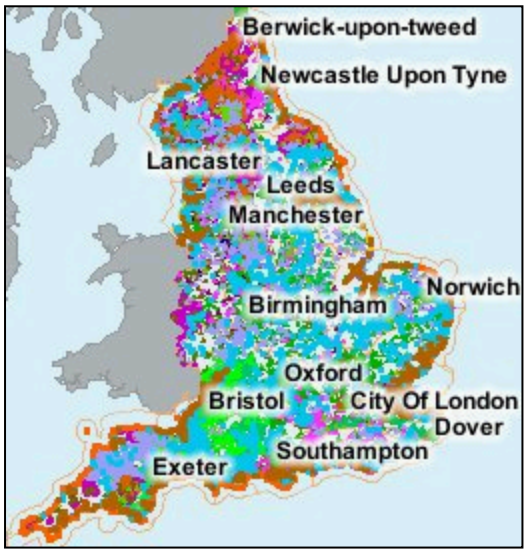
What information is available?

Habitat data

Through English Nature's Nature On-line project 23 national BAP priority habitat inventories were prepared based on existing national datasets. These inventories are available through the English Nature *Nature on the Map* website (www.natureonthemap.org.uk). The corresponding GIS data will be available for download from the English Nature website.

As part of the NBN Southwest Pilot, English Nature supported the local record centres there in preparing inventories for BAP priority habitats. These inventories were based on data available locally. The Southwest local record centres should be approached directly for access to this data.

More detailed habitat information may also be available from other bodies eg local biological record centres, wildlife trusts or local authorities for other parts of the county.



Species data

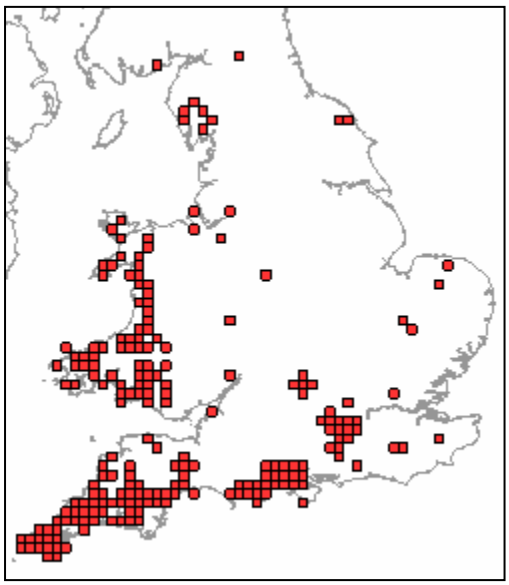
As part of the NBN Southwest Pilot a number of species datasets have been made available through the NBN Gateway by the local record centres. Access to these datasets is managed by the individual record centres but is typically set at 10km summary data for the general public and full access for Service Level Agreement holders.

Additionally, a number of national species datasets have been made available through the NBN Gateway, primarily by national voluntary recording schemes and the Biological Records Centre at Monks Wood.

The resolution at which these datasets were collated and the level of access available varies between datasets. The NBN Gateway access controls enable dataset administrators to set

different levels of access to different individuals and organisations. The NBN Trust has been has been working with dataset administrators in establishing access policies for the datasets on the NBN Gateway.

Herpetological Conservation Trust, for example, have decided on an access policy of providing 10km records to the general public and 1km access to all other users, including anyone registered on the NBN Gateway and county agencies (eg English Nature). Because of the perceived sensitive nature of some of these records, and concerns over misinterpretation of the data, only individual specialists will be provided with full access to the location of individual records. Other datasets, such as data from the Odonata Recording Scheme, are made available to the public at full resolution.



How can you use this data?

Determining the species recorded in a geographic location

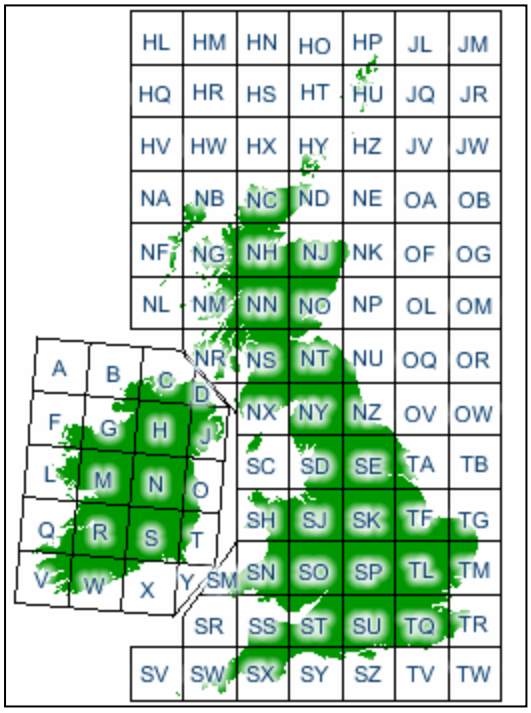
Local planning authorities are required to consult English Nature where a development proposal is likely to result in harm to a protected species or its habitat. The NBN Gateway can help in screening whether there are protected species have been recorded that may be affected by a planning application.

The Environment Agency undertakes species casework, for example when issuing water abstraction licenses they need to determine if BAP species, such as water voles, have been recorded along the affected water course.

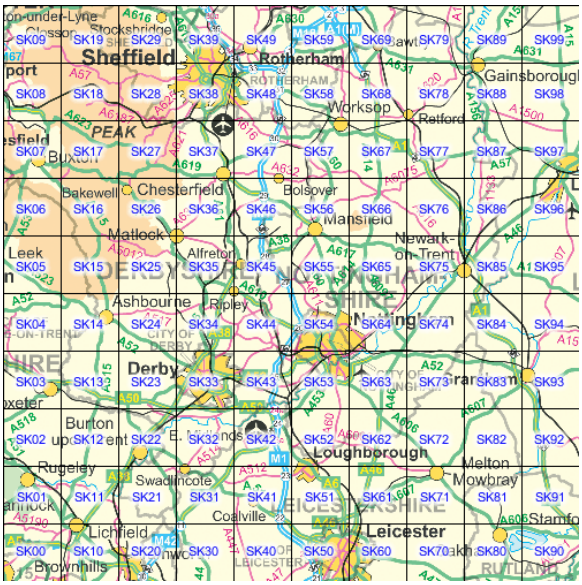
For Agri-environment applications the Rural Development Service are interested in whether protected or BAP priority species have been recorded in the vicinity of the application.

Using the NBN Gateway it is possible to obtain a list of important species for a 10km grid square.

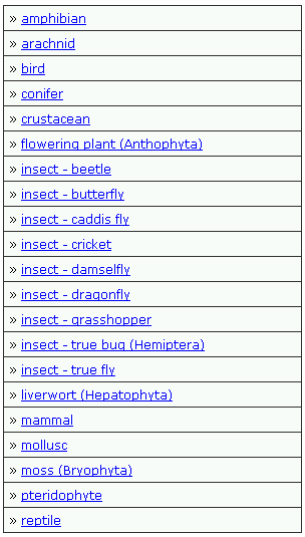
From the NBN Gateway homepage, under Geosearching, click on the UK map on the appropriate grid square for the planning proposal.



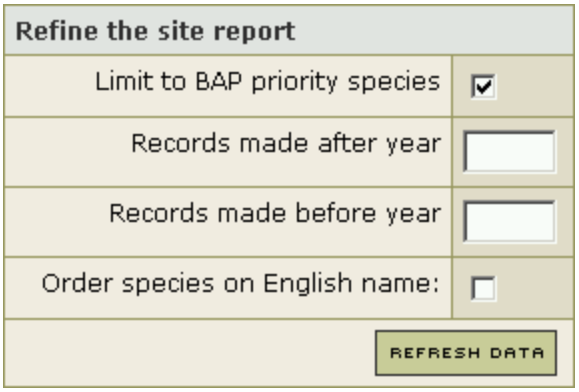
This will then be replaced with a map of 10km squares for this area, click on the square corresponding to the application.



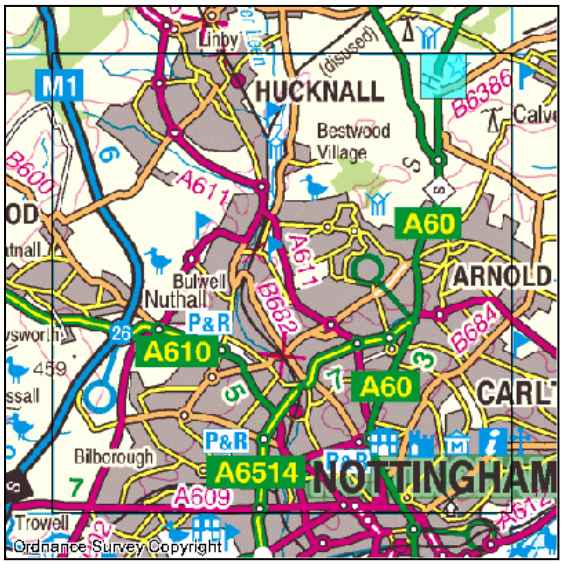
This will result in a report including a list of the species groups occurring within this 10km square.



It is possible to refine the report to include only BAP priority species. Check the box to the right of *Limit to BAP priority species* and click on *Refresh Data*.



The species groups with priority species records occurring within this 10km are then displayed. Click on the species group (eg birds, mammals etc.) to see a list of individual species within this group. Click on the name of an individual species name eg Caprimulgus europaeus (Nightjar) to see a map of its distribution within this 10km square.



From this map you will be able to see whether the species record in question is in the vicinity of the application area.

Note: Ecological knowledge may be necessary, particularly for mobile species, whether species recorded outside of the immediate area of the planning application are likely to be affected.

There may be other local sources of species records which should also be consulted. Local record centres can provide a screening process for planning applications and provide tailed reports with other contextual information.

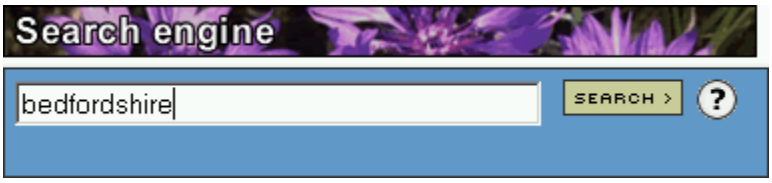
Determining the distribution of a species across an administrative area

When designating SSSIs for biological features one of the criteria is the rarity of the species or habitat in the area of search. Local authorities can designate local nature reserves for areas of local wildlife importance and likewise need to know the significance of individual species locally.

When preparing Local Biodiversity Action Plans it is important to determine the distribution of a proposed species for inclusion in the plan in a local, regional or national context.

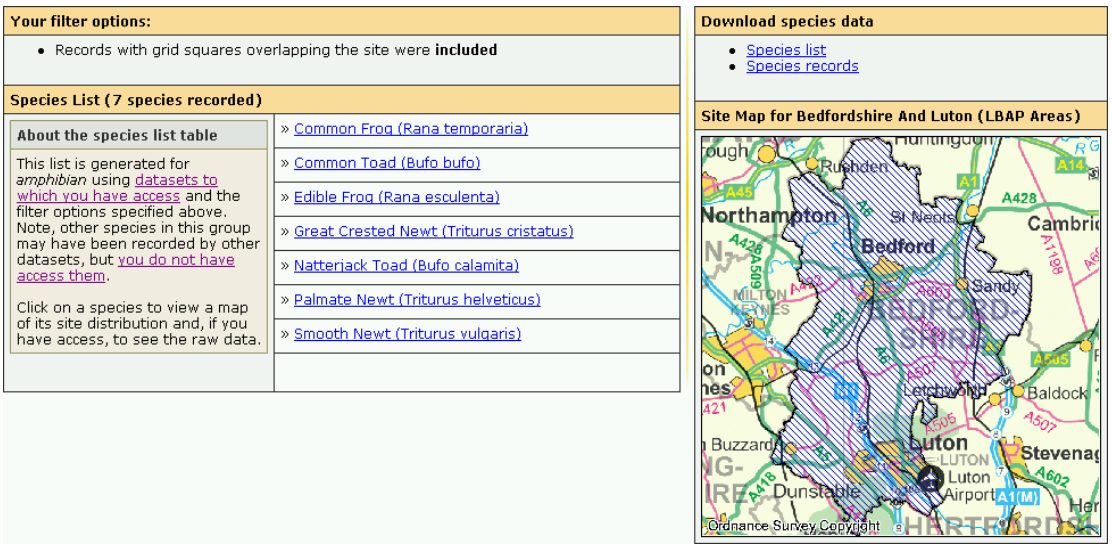
The NBN Gateway provides species lists across a range of areas including LBAP areas, natural areas and Government Regions.

Open the NBN Gateway website, www.searchnbn.net and enter the area of search into the search bar.



From the search results click on the *Sites* tab and select the appropriate area, *eg Site report, including species list, for Bedfordshire And Luton (LBAP Areas)*.

The site report will be displayed with a list of species groups and a map of the selected area. Click on the species group you are interested in. This will produce a list of species, within this group, recorded within your area of search. Where this list consists of multiple pages you can navigate through these using the links on the left hand side.



Clicking on the name of a species will produce a report of this species distribution across the search area. For larger areas the distribution of 100m records may not display on the map. At the bottom of the page will be a list of these records. It is also possible to download the data.

Site name	Gridref	Date Recorded	Sensitive
HEDGE	TL008160	5/12/1993	N
MASONS PLT	TL011158	5/12/1993	N
LONG WOOD	TL022141	5/12/1993	N
BYSLIP	TL031165	19/10/1993	N
BEDFORD PURLIEUS	TL042994	3/7/2001	N
MAULDEN WOOD	TL068390	2001	N
BRAMPTON WOOD	TL180701	22/6/2000	N

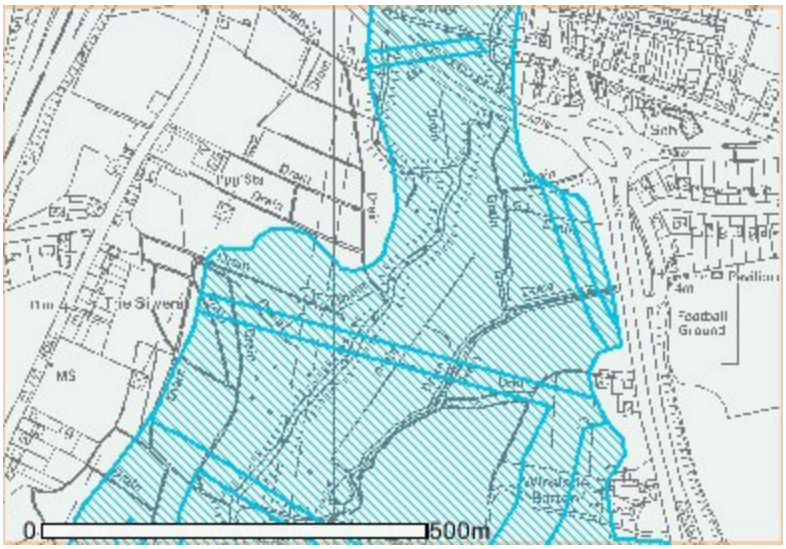
Determining the habitats occurring in a geographic location

As part of the NBN South West Pilot, the Rural Development Service re-evaluated decisions agri-environment scheme applications with additional data available on habitats and species mobilised through the NBN partnership. They found that around 50% of the decisions would have been different in the light of this additional information. A number of the applications would have been entered for higher level schemes.

The English Nature - Nature on the Map website contains UK BAP priority habitat inventories at land-parcel scale across England. To access this data open the website www.natureonthemap.org.uk, click on *Biodiversity Action Plan Priority Habitats* on the list of maps on the right hand side of the page.

To navigate to a particular location you can either use the navigation controls on the left hand side of the map (note: there are shortcuts eg pressing *Ctrl* whilst dragging a box with the

mouse will zoom-in); or you can enter the postcode or place name of where the application is for.



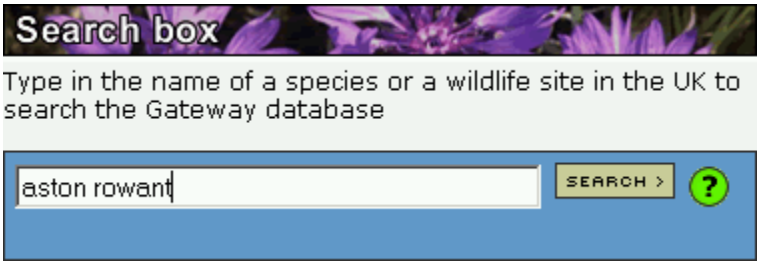
This will show a map of the incidence of BAP priority habitats with individual fields which can assist in identifying the appropriate scheme.

The distribution of priority habitats can also assist in the preparation of development plans by local authorities and of local habitat action plans.

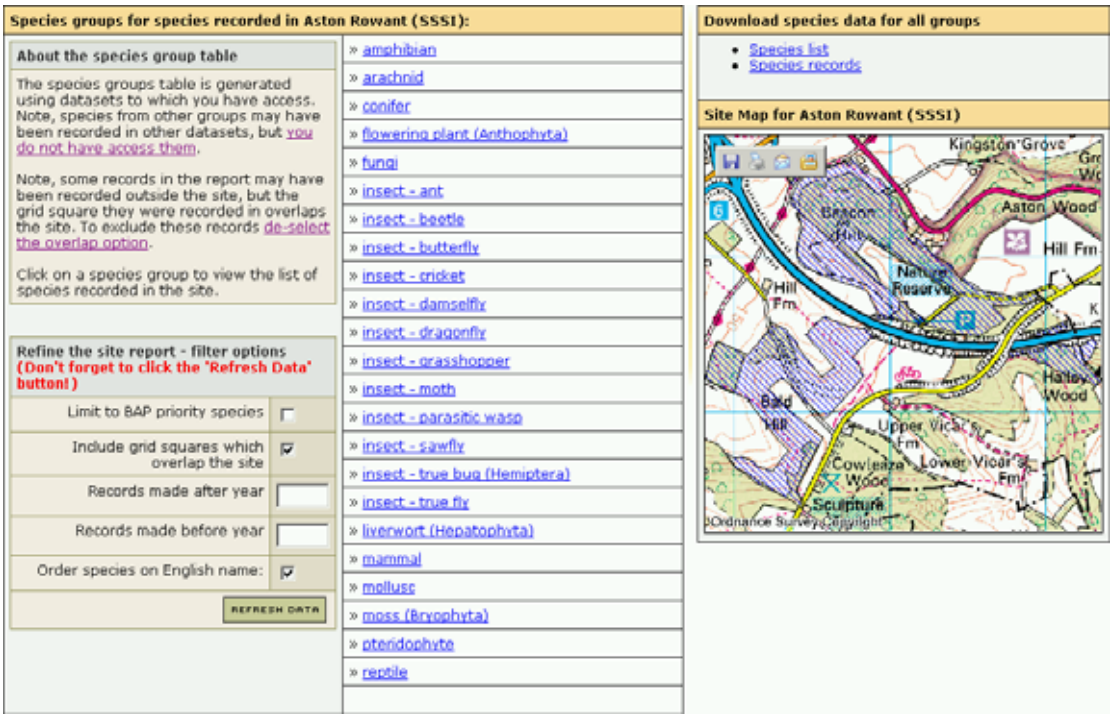
Determining the occurrence or distribution of a species across a designated site

The NBN Gateway could potentially assist in condition monitoring of designated sites where recent survey data are available. It could help in keeping better track of the status of species on individual sites and larger areas to assess outcomes and detect declines earlier.

Open the NBN Gateway website www.searchnbn.net. Type the name of the designated site into the search bar.

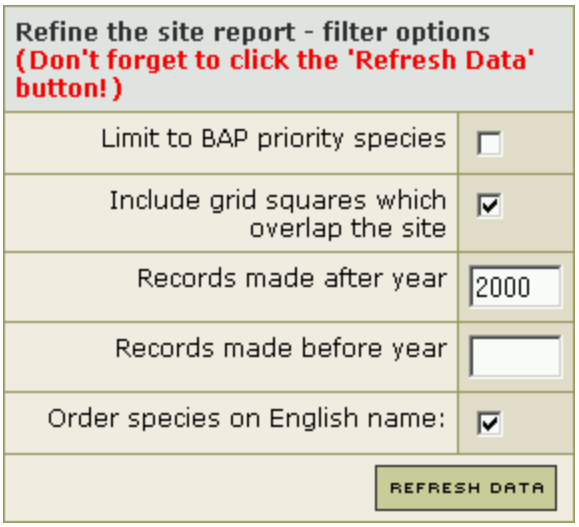


Select the required report from the results page, eg *Site report, including species list, for Aston Rowant (SSSI)*. This will produce a site report for this SSSI similar to the report for other geographical areas.



Note: Underneath the report is list of datasets from which data have been included. Clicking on the name of the dataset will display the metadata which should allow you to determine the reliability and appropriateness of the dataset for your query. You can exclude datasets that you do not require from the site report. Underneath this is a list of additional datasets on the NBN Gateway with data for this site to which you do not currently have access.

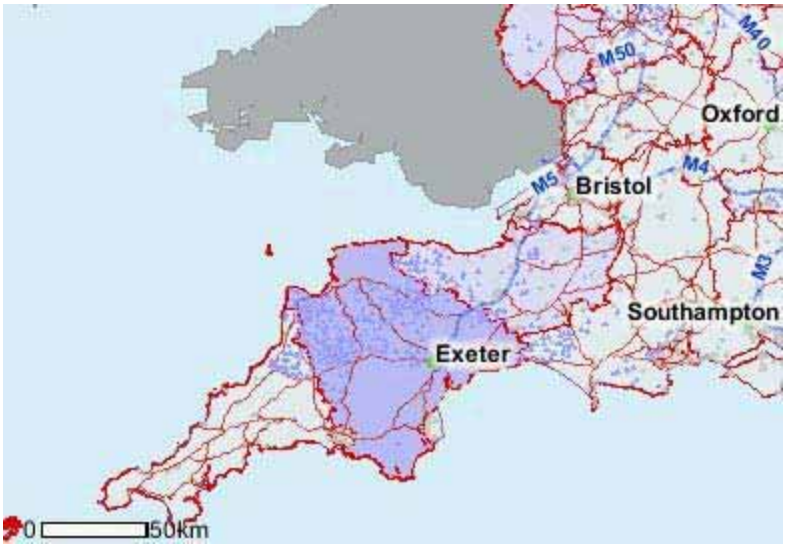
It is possible to exclude older records from the site report by entering a value for *Records made after year* and clicking on *Refresh data*.



Note: It will also be possible to access the NBN Gateway site report for SSSI's from the Nature on the Map, Advanced Map (to be renamed Targeting and Planning Map), Information page.

Determining the habitats occurring in an administrative area

When preparing a local biodiversity action plan it is important to know what the status of species and habitats occurring within your area in a regional and national scale. For example, *purple moor grass, rush pasture* was not originally included the LBAP for North Devon district. In fact the district has 20% of resource for this habitat in the South West and the South West is nationally important for this habitat.



The distribution of priority habitats across an area of search can also be valuable for designation of statutory sites.

The Advanced Map (to be renamed Targeting and Planning Map) component of Nature on the Map provides a thematic mapping option to assist with this sort of interpretation. To produce a map of *purple moor grass, rush pasture* by district:

Open the website www.natureonthemap.org.uk, click on *Maps* on the toolbar on the top left corner of the page, then click on *Advanced Map* on the list of maps. The first time you click on this the *Advanced Map Wizard* will open. You can re-open this page by clicking on the  icon on the toolbar.

From the *Advanced Map Wizard* select the Base Layer *NUTS 3*. This is equivalent to districts. You will be asked if you want to create a thematic map for this base layer. Select *Yes* and select *% of National Resource of Purple Moor Grass and Rush Pasture*. Click on *Next>>* twice and *Finish* to display the map.

You will now see a map with districts coloured according to the proportion of this habitat. You can also add the actual location of the habitat by returning to the wizard and selecting *Purple Moor Grass and Rush Pasture* as the BAP Priority Habitat Layer.

To find the actual proportion of a habitat within an area, select the information tool  and click on the district on the map. On the Information Page are details of the area of this habitat and its ranking nationally.

NUTS3

Name	Total Hectares of Purple Moor Grass and Rush Pasture	% of National Resource of Purple Moor Grass and Rush Pasture	National Rank for Purple Moor Grass and Rush Pasture Presence	BAP Priority Habitats
Devon CC	3493	8.3	Rank: 4 of 75	Priority Habitat Details...

You can also obtain details of other BAP priority habitat in this district by clicking on the *Priority Habitat Details* link.

NUTS3 Areas: BAP Priority Habitats within Devon CC:

BAP Priority Habitat	Total area (ha) of habitat in selected feature	% of National Resource of habitat in selected feature	Rank of selected feature within Base Layer, by area of habitat
Blanket Bog	13543	6.5	Rank: 6 of 24
Coastal Sand Dunes	1039	10.2	Rank: 6 of 27
Coastal Vegetated Shingle	45	1.6	Rank: 10 of 14
Fens	10640	8.7	Rank: 3 of 77
Lowland Beech and Yew Woodland	2829	8.6	Rank: 4 of 57
Lowland Calcareous Grassland	322	0.7	Rank: 24 of 61
Lowland Dry Acid Grassland	904	1.7	Rank: 12 of 54
Lowland Heathland	0	0	
Lowland Mixed Deciduous Woodland	4866	3.5	Rank: 9 of 84

Note: The statistics relating to area of habitat are approximate and should only be considered as indicative. The errors in calculation are particularly significant for small areas such as parishes.

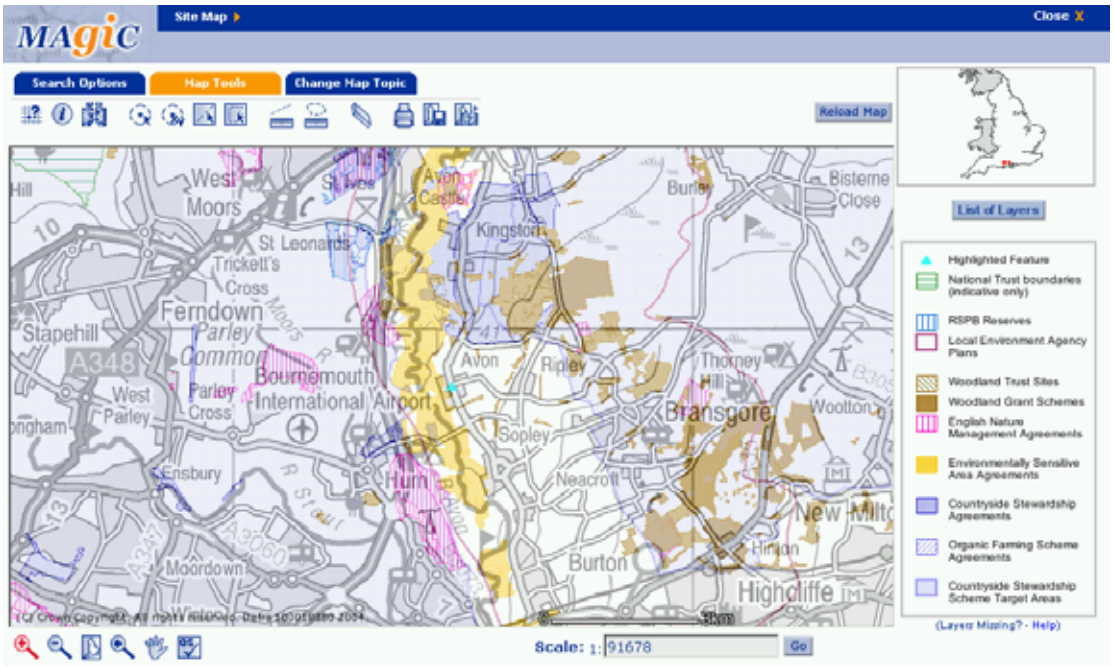
Determinining existing designations and land management schemes for a geographic area

Local authorities are required to take nature conservation objectives into account when developing local plans. Many sites of local nature conservation importance are given designations by local authorities and by local conservation organisations.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website contains information on rural land based schemes and rural designations which can help target local planning decisions to sites most at risk.

Open the website: www.magic.gov.uk, and click on the 

icon. Select the data you wish to view, eg *Rural Land-based Schemes*. Select your method of searching and enter the name of the search area below.

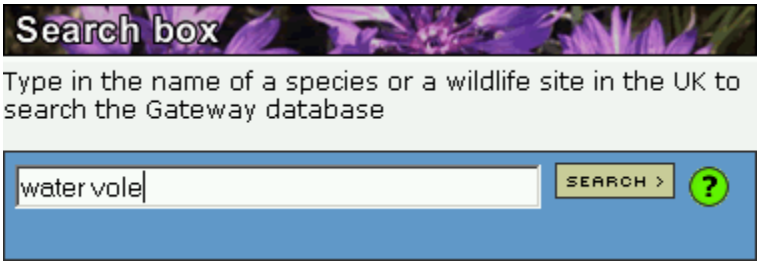


A map showing existing schemes for this area will be produced. You can also produce a map of statutory or other designations by clicking on *Change Map Topic* above the map.

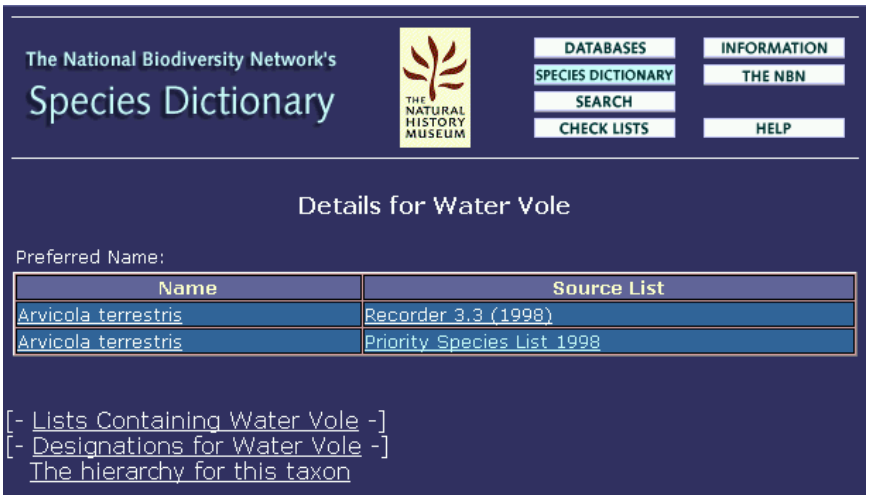
Note: Nature on the Map, Advanced Map provides a direct link to the Magic website for the current map extent from the Information page.

Determining the conservation status of a species

To determine the conservation status of a species: from the NBN Gateway homepage enter the name of the species into the search bar:



On the search results page there is a link to: *Related websites*, click on this. The search results will now include: *Basic taxonomic information on Water Vole provided by Natural History Museum.* This will open the NBN Species Dictionary website. You can see that *Arvicola terrestris* is included in the BAP priority species list. If you click on the *Designations* link you can see that it has no other legal protection.



How can you help to improve this data?

An important point to note is that the information available on BAP priority habitats through Nature on the Map and species from the NBN Gateway is not complete. Other information may be available via local voluntary recording groups, local biological record centres and large biodiversity organisations. We intend to actively encourage these bodies to use the NBN Gateway and Nature on the Map to make their data more accessible and hence provide a more comprehensive service. You can help this process by supporting your local record centre and/or recording groups and making your biodiversity data available through these local routes or directly to the NBN Gateway.

ENGLISH NATURE

English Nature is the Government agency that champions the conservation of wildlife and geology throughout England.

This is one of a range of publications published by:
External Relations Team
English Nature
Northminster House
Peterborough PE1 1UA

www.english-nature.org.uk

Cover printed on Character Express, post consumer waste paper, ECF.

ISSN 0967-876X

Cover designed and printed by Status Design & Advertising, 2M, 5M, 5M.

Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Middle left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell/English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
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