SCOTTISH NATURAL HERITAGE

No 79

Scottish Natural Heritage species data needs - analysis of requirements

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Research, Survey and Monitoring

REPORT

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Newell & Budge Ltd, 6 Coates Crescent, Edinburgh EH3 7AL

Nominated Officer:	James M Williams, Environmental Audit Branch
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Scottish Natural Heritage
Publications Section
Battleby, Redgorton, Perth PH1 3EW
UNITED KINGDOM

Scottish Natural Heritage
Advisory Services
2 Anderson Place, Edinburgh EH6 5NP
UNITED KINGDOM

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1. MANAGEMENT SUMMARY

This report has been produced following a study to investigate SNH's requirements for species data. The work involved a series of meetings with a total of 46 participants, including SNH staff from local, regional and national levels, JNCC, and external organisations involved in exchange of species information with SNH. The scope of the study was restricted to species, not habitats, although it is likely that many of the same issues will apply to both.

The participants highlighted a range of problems with obtaining and using species data needed for their essential work. Nearly all of the SNH staff believe that the information available to them is inadequate for the work they need to carry out. Local staff have a particular problem as much of the information has been gathered without focusing on their needs, and they lack access to major datasets.

Most of the problems stem from the following main causes:

- Insufficient information exists overall, with major gaps both in the groups of species covered and in the geographical spread of records. The more "obscure" groups of species are poorly covered, and records tend to reflect the distribution of recorders. Furthermore, the trend is downwards as many specialists are nearing retirement and there are fewer to succeed them.
- Such information as does exist is scattered. Much is held on paper, so cannot be accessed flexibly. It is often spread over many sources, hence is difficult and time-consuming to collate, and may also lack an adequate geographic reference.
- Information frequently lacks standards so may not be usable at all, or may not permit linkage or comparison with data for other species or locations. Its retrieval may be inflexible, being accessible only according to restricted categories without cross-references.
- Its existence is often unknown to many potential users, being poorly documented and dependent on ad hoc contacts between individuals. Many of the suppliers are either voluntary or poorly resourced, often lacking computing facilities, so cannot provide data easily even when they have it. Staff consequently waste much time in searching for information and still overlook important sources.
- The flow of information from suppliers of data to SNH is generally poor and reliant on informal arrangements which depend on the good will of those involved. This is an increasing problem as SNH staff turnover is now higher than in the past, and it takes time for new staff to build up a network of contacts.
- Within SNH, exchange of information between the local and national levels is problematic, with the main issue being the time taken to access and collate information required by other staff.
- Paper records are insecure, with instances where they have been lost or destroyed. The logistics of extracting data from such sources are a barrier to their use.
- Staff are unclear on data security and legal issues relating to release of information. There is consequently a lack of consistency of practice.

Nearly all the staff consulted experience most or all of these problems. It is clear that they need to be addressed if SNH, and the conservation and biological recording community as a whole, is to make efficient use of available information. This will also allow genuine

gaps in the data to be identified and resources to be concentrated where they are most needed.

To achieve this, the following key actions are recommended. (A full list of recommendations can be found in Section 7).

- Direct access for SNH staff, nationally and locally, to major national datasets held both externally and in-house, with standard categories for storing and querying data, particularly by spatial reference.
- Support for the data management role for Local Records Centres proposed by the Millennium Bid. Interim guidance to staff on data security issues.
- A strategic decision on the use of computerised versus paper records in the long term, and standards for filing where paper is to be used.
- Identification of gaps in the current data resource and setting of priorities to fill them.
- Greater use of electronic recording and exchange of local information, particularly casework, to promote best practice across all sites and regions.
- Interim measures for recording species data to a standard, pending the introduction of the new corporate databases for sites and monitoring.
- Proactive guidance to volunteers on the type of data needed and the standards they should use.

2. BACKGROUND TO THE PROJECT

This study was carried out following a series of previous initiatives concerned with biological recording. The following is a brief summary of the background.

Concerns raised by the Linnean Society report *Biological Survey: Need and Network*[1] about lack of co-ordination of effort in UK biological recording led to the establishment of the Co-ordinating Commission for Biological Recording (CCBR). The CCBR then carried out an investigation into the current status of biological recording, particularly with regard to the local level. The resulting report, *Biological Recording in the United Kingdom: Present practice and future development*[2] identified the main organisations involved, and also stressed the importance of the voluntary sector in collecting data.

In parallel with this at the international level, the UK Government took part in the Earth Summit in Rio in 1992, and, following commitments made there, in 1994 published *Biodiversity - The UK Action Plan*[3]. This in turn led to further work in 1995 under the auspices of the UK Biodiversity Steering Group, which picked up on points raised in the CCBR report and proposed various projects at both UK and local levels.

A third strand to develop was the preparation of a Millennium Bid by a consortium consisting of the Joint Nature Conservation Committee (JNCC), the Natural History Museum, Natural Environment Research Council (NERC), and the local Wildlife Trusts. This proposes a series of projects, and is discussed in Section 5.2.6.

Against this background, SNH has developed its own draft *Biological Recording Strategy*[4], which makes recommendations on the approach that SNH should adopt with regard to these other initiatives, placing them in a Scottish context, and to biological recording generally. This report also provides a fuller discussion of the background summarised above. One of the recommendations made in this strategy is that SNH should carry out "an analysis of the extent to which SNH's information needs can be met by biological records". This recommendation led to the commissioning of the present study, which had the following objectives:

To identify strengths, weaknesses, opportunities and constraints by addressing the following:

- Identify the range and type of the most common decisions and consultations which depend on or use biological data and information, and which of these are the most time consuming.
- Compare the information needed to take decisions with the main sources of information available to staff in the locations where they work.
- Analysis of the questions or decisions staff feel they cannot answer effectively through lack of species information.

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[1] Linnean Society. (1988). Biological Survey: Need and Network. Report of a working party set up by the Linnean Society of London. Chairman R.J. Berry. London, PNL Press.

[2] Co-ordinating Commission for Biological Recording. (1995). Biological Recording in the United Kingdom: Present practice and future development. Department of the Environment: Summary report. London, HMSO.

[3] Anon. (1994). Biodiversity: The UK Action Plan. Cm 2428. London, HMSO.

[4] Scottish Natural Heritage. (1996). Biological Recording Strategy. Draft version 4.

- Analysis of the most used, and most valued, sources of information, and why these are used and valued.
- Analysis of the scope and detail of information used in decision making.
- Analysis of uncertainty/gaps/weaknesses in existing data, and the effect this may have on decisions.
- Consideration of local offices where formal or informal arrangements have been made with other bodies, including Local Records Centres, to supply information; analysis of the information supplied, how useful it is in practice, and how it relates to the decision types being taken locally.
- Identify if proactive use of information could reduce the load, or whether filtering could concentrate agency effort. For example, to answer questions or decisions which impose heavy demands on information collation or searching.
- Identify mechanisms for the delivery of information to SNH staff at national, regional and local levels.

The full terms of reference for the study are contained in the paper *Business Analysis of Species Data Needs: Annex A* [5]. The intention is that the conclusions of this study will inform other proposed projects involving species information. There is no plan to develop any computer system specifically to address the issues raised, and this point was stressed to staff participating in the study.

The scope of the study was restricted to looking at species data and not other types of biological records (mainly habitats) in order to tackle a manageable area of work. Some staff found it difficult to separate species work from other issues, and there is often no clear line between species assemblages, communities and habitats. However, this was not generally a major problem, and it is likely that many of the issues identified by this study will prove to be applicable to habitats and other types of data.

[5] Scottish Natural Heritage. (1996). Business Analysis of Species Data Needs: Annex A. SNH.

3. APPROACH TO THE ANALYSIS

To obtain a representative picture of SNH's requirements for species information, a wide range of staff and external parties were consulted. These included:

- Local staff directly involved with sites and their management
- Specialist staff who act as a centre of expertise and inform policy
- External organisations who exchange data with SNH
- "Customers" of SNH's information (whether as advice or published material), including statutory duties such as Government reporting requirements. This group overlaps with data suppliers.

A full list of participants is provided in Appendix A.

These participants were interviewed in a series of meetings and workshops, involving between one and six participants. In all cases, a format was used which aimed to establish the main areas of the person's work which use species data. In the case of SNH staff, these work areas were then cross-referred to SNH's Operational Plan objectives to ensure that a representative spread of functions were considered.

Using this information as background, the types of species information currently used, and their main sources, were identified, highlighting those which are found to be most useful and the reasons for this. Participants described the means by which they receive data from these sources, and any problems with present arrangements. They then identified areas where they lack the data that would enable them to carry out their job functions, and whether this is due to non-existence of the data or difficulties of access.

The main outputs involving species information were then identified, and the customers for these products. As with information received, the arrangements for supply of information to its recipients were discussed, and how satisfactory these are. This report discusses the main findings of this study.

4. MAIN FUNCTIONS USING SPECIES INFORMATION

The purpose of this section is to set out the main areas of work for which SNH uses species information. For each work area, the major tasks involved are identified, and then the categories of species information needed. Because of the structural review currently in progress, the species data needs are linked to functions rather than particular job roles. This is based on the assumption that the functions of SNH will not change and that recommendations based on these will not be invalidated by any changes to the structure.

The functions have been grouped into local/regional and national in order to show where the main responsibility for the work lies. However, in practice the division is not always clear-cut and national staff contribute to local functions and vice versa. Appendix D provides a summary of the types of information used by each function; these are discussed in more detail in the remainder of this section.

4.1. Local and regional functions

4.1.1. Carry out statutory and other local consultations

This is a broad area of work, referred to as case-work, and was cited by all local and regional staff consulted as one of their main functions requiring the use of species data. Its purpose is to ensure that the species interest of a site is adequately represented when a development or other action is proposed. If it is inadequately carried out, there is a risk that developments which are detrimental to species may be allowed to proceed simply because the authority involved was unaware of the interest on the site and the likely negative effects of the proposal. Such consultations could be on statutory sites or in the wider countryside.

In the case of marine sites, this function is carried out regionally or nationally as local staff normally refer all marine casework directly to the national marine specialists, or regional where the role exists.

The nature of the work is reactive and often requires a rapid response time. It is the most difficult area for which to define a set of information requirements as it is unpredictable and the type of issues which arise may need information on almost any species in any location in Scotland, on and off SSSIs. For this reason, it is impracticable for SNH to hold in-house all the information which could ever be required to support casework, and the key will be to have ready access to data held by others.

Main tasks involved

The types of work involved include the following:

- Advising Local Authorities on planning and development proposals.
- Advising the Forest Authority on afforestation proposals, including Woodland Grant Scheme consultations.
- Advising local councils (mainly Highland) on proposed renewable energy developments, such as wind farms.
- Representing SNH at Public Inquiries.
- Advising various bodies on grant-aiding proposed works, such as improved access to a site.

- Carrying out marine consultation work, including advising on coastal and marine casework such as fish farms, oil and gas licensing round, and rapid response to oil pollution incidents

Species information needed

This type of consultation work requires knowledge of what species are present and interpretation of this information, to assess the likely impact of the proposed development. The information needed can be categorised as follows:

- Local species information with a sufficiently precise spatial reference to allow it to be related to the proposal in hand.
- Background ecological information, including relationships between each species and its habitat, and sensitivity of the species, to allow interpretation of the likely effects of the action or proposed development.
- Statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the given site and support SNH's case if a development is opposed.

4.1.2. Manage statutory sites

This function relates to all statutory sites for which SNH is responsible, including SSSIs, SACs, SPAs and NNRs. Where the site is directly controlled by SNH (usually for NNRs), the work involves producing and implementing management plans, while for sites managed by others (most SSSIs and Natura 2000 sites), the function is carried out by producing site management briefs and agreeing the management with the owner or occupier. Again, for marine sites, this is led at national level with local input to management plans.

Having produced the management plan, staff then have an on-going role in monitoring the species interest present on the site according to national standards. The outcome of this may in turn lead to a decision to revise the management plan where the condition assessment indicates that this is necessary.

Main tasks involved

- Produce management plans for SSSIs, NNR, and marine pSACs.
- Carry out monitoring of all sites to SNH's agreed programme.
- Following monitoring, identify what additional action may be needed to achieve the required conservation status of a species on a given site.
- Identify additional species which meet the SSSI selection criteria but are not on the original citation. Where this is significant (e.g. for an EC Directive species), renotify the site.

Species data needed

- Inventory of the qualifying species present on the site.
- National and regional context of the species present.
- Background ecological information, including relationships between each species and its habitat, and sensitivity of the species.
- Best management practice for each species and the habitats needed to support it.

- Statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the given site for the species.

4.1.3. Select sites for designations

This area of work involves the proposal of sites for notification as SSSIs or international designations. It depends on an understanding of the interest of the site in relation to the selection criteria and the national and international context of the site. Although more sites are notified for habitat than for species interest, it is important to know the species interest on the site, especially where there are qualifying species which do not form part of the notification. For marine sites, this is done nationally with input from local staff.

Main tasks involved

- Identify qualifying species on proposed site.
- Define appropriate site boundary based on ecological requirements of the species.
- Produce justification for sites with species context.

Species data needed

- Inventory of the qualifying species present on the proposed site.
- Background ecological information to assess the appropriate site boundary needed to support a viable population of the species.
- Statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the proposed site for the species.

4.1.4. Carry out species management

This function deals with management of a given species overall, rather than at the site level (see Function 4.1.2). A major component is work relating to the Biodiversity Action Plan, particularly local input to Species Action Plans, but also other projects dealing with species at a cross-site, regional or national level.

Main tasks involved

- Produce Species Action Plans - local staff have input to these, particularly where a species is a major issue for a given region. This has involved a lot of work recently and is likely to continue to do so over the next 2-3 years.
- Implement Species Action Programmes and carry out monitoring of species at site and wider countryside levels.
- Identify where a change is needed to a Species Action Programme in the light of condition assessments made through monitoring.
- Provide statutory advice on species (e.g. bats).

Species data needed

- Sites which are notified for the given species.
- Background ecological information, including relationships between each species and its habitat, and sensitivity of the species.
- Best management practice for each species and the habitats needed to support it.
- Statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the given region for the species.

4.1.5. Provide educational advice and literature

Local staff have a role in providing ad hoc advice and information in response to local enquiries. These can be wide-ranging in nature, and vary from specific to very general. Some of the enquiries received are too general to allow a satisfactory response, such as requests for all available information on a particular subject for a student project. Many staff took the view that the onus should be on the enquirers in such cases to formulate a more considered and precise request before expecting a full response. Nonetheless, such requests can be very time-consuming.

Main tasks involved

- Research the information requested by an enquirer.
- Collate and interpret the available data to produce the required information.
- Present the information in a format suitable for the type of enquirer.

Species data needed

The species data needed for this role is difficult to predict as enquiries vary widely, both in subject matter and level of detail required (from school students to academics). It can include:

- Ecological information on a particular species.
- Distribution and population levels of species.
- General ecosystem information about a particular site.
- Recommendations on best practice for management of a particular species.

4.1.6. Advise on issue of licences and carry out species protection

Local staff are involved in advising on whether a licence should be issued, liaising with the central licensing function and with issuing authorities (e.g. the Scottish Office). They may also be involved in prosecutions where a licence was required but not obtained. In the marine area, there is a national function to advise the Scottish Office Agriculture, Environment and Fisheries Department (SOAEFD) on the issuing of licences.

Main tasks involved

The work involved is mainly as follows:

- Advising SNH central licensing staff and external licensing authorities on the issuing of licenses.
- Preparing and taking up prosecution cases.

Species information needed

Licenses may relate to a specific site or species, so this work requires knowledge of what species are present on a site and interpretation of this information, to assess the likely effects of issuing a licence. The following information is needed:

- Local species information with a sufficiently precise spatial reference to allow it to be related to the site for which a licence is requested.
- Background ecological information, including relationships between the species for which the licence is requested and other species on the site, and sensitivity of the species, to allow interpretation of the likely effects of the proposed licence.
- Statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the species on the given site or region, and support SNH's case if a licence is refused.

4.1.7. Advise on species to receive statutory protection

As well as providing input to Species Action Plans, local staff are involved in advising on revisions of schedules (e.g. the Quinquennial Review) and Annexes of international directives.

Main tasks involved

- Produce recommendations on species for inclusion or removal from schedules.

Species data needed

- Sites which are notified for the given species.
- Background ecological information, including relationships between each species and its habitat, and sensitivity of the species.
- Current statutory protection applying to each species and other status (e.g. Red Data Book).
- Local, regional, national and international context of the species, to assess the relative importance of the given region for the species.

4.2. National functions

4.2.1. Provide national species context to local staff

This is a broad function which is relevant to many areas of local officers' work. It is one of the main roles of species specialist staff, and the purpose is to advise local staff on the national context of species so that they can assess the relative importance of local sites, particularly in support of casework. For marine species, this function is much more extensive as local staff normally refer marine work to national specialists.

Main tasks involved

- Advise local staff on the sites likely to contain particular species of note.
- Advise local staff on whether a species is uncommon locally, nationally, at GB level, or internationally, and whether populations are stable or declining. (This includes provision of data to support casework).
- Advise local staff and land managers on best practice for species management.

Species data needed

- Species coverage of Scotland, at species and community level, spatially referenced (greater resolution for rarer and more protected species).
- Legal and other status of species.
- Time-series population trend data.
- Status of rare and declining species.
- Conservation status of protected species on sites.
- Species ecology (including natural population dynamics and limits of acceptable change) and management methods.

4.2.2. Develop access to species data

This work area covers a range of central species functions, designed to provide an overall context at the highest level for species work within SNH.

Main tasks involved

- Providing advice to other staff on metadata.
- Identifying indicator species and providing advice on this.
- Development of Biological Recording Strategy.
- Identifying tools and methods to inform policy.

Species data needed

- High level summaries of sources of species data available.
- Trends (population and time-series data) for main species groups, particularly those with a high public profile.
- Statutory status of species, particularly those on lists for Natura 2000 and the Biodiversity Action Plan.
- Land cover data and its association with species.

4.2.3. Carry out national reporting functions

SNH is required to produce a number of reports at the national level, drawing on information summarised from local data.

Main tasks involved

Reports produced (or contributed to) include the following:

- Natura 2000 reports
- SSSI monitoring reports
- Scottish Environmental Statistics
- Natural Heritage of Scotland
- Loss and Damage reports

Species data needed

- Site monitoring data.
- Trends (population and time-series data) for main species groups, particularly those which are under threat.
- Conservation status of scheduled species, particularly those under Natura 2000 and identified in Species Action Plans.

4.2.4. Produce Species Action Plans

This is a recent area of work arising out of the Biodiversity Action Plan. It has involved a significant amount of effort over the past 2 years producing plans for the initial short-list of species, and will continue to do so over the next 2-3 years for the next tranche of species on the "middle" list. Local staff may provide input, but the work is co-ordinated by national species specialists.

Main tasks involved

- Collate background information on each species for which a plan is required, including commissioning of surveys where needed.
- Define main issues affecting species.
- Define appropriate actions to address the issues identified, with targets and timescales.

Species data needed

- Detailed distribution data for each species for which a plan is required.
- Legal and other status of the species.
- Time-series population trend data.
- Defined "favourable conservation status" for each species.
- Species ecology (including natural population dynamics and limits of acceptable change) and management methods.

4.2.5. Co-ordinate SNH input to international obligations

This function overlaps with the provision of national species context information and national reporting functions, but relates specifically to international directives and conventions. Such work is co-ordinated by JNCC as one of the special functions of the Country Agencies, but SNH has a role in collating Scottish input to the process.

Main tasks involved

- In conjunction with JNCC, other Country Agencies and relevant Government departments, provide advice on draft international legislation and directives.
- Agree a standard approach to fulfilling the requirements of directives.
- Advise local staff on their involvement, and provide standards for information to be gathered.
- Collate information provided by local staff into the required reporting format.

Species data needed

- Proposed sites and their species interest in relation to internationally designated species.
- Species coverage of Scotland, at species and community level, spatially referenced for designated species.
- Legal and other status of species.
- Time-series population trend data.
- Defined "favourable conservation status" for rare and declining species.

4.2.6. Co-ordinate site management

This area of work is becoming increasingly important as it includes the new area of producing Site Management Statements.

Main tasks involved

- Advise local staff on features of interest for which specific management should be agreed.
- Produce national summaries of species and groups involved in Management Agreements.
- Identify priorities for species management on sites.
- Support local staff involved in management of NNRs (includes management of contract for CMS software).
- Advise Local Authorities on species management for LNRs.

Species data needed

- Species interest on sites (at individual species level and higher level groupings, e.g. waders).
- Species covered by legal and other status.
- Species involved in specific cases, including loss and damage.
- Site Management Statements produced by local staff.
- Guidance on site management for species interest.

4.2.7. Carry out site evaluation at national level

This is a national function to ensure that the overall site series for Scotland is representative and consistent across all regions, and within the GB and international context.

Main tasks involved

- Advise local staff on national context of species for which a site is being proposed.
- Identify main sites for important species (through commissioned survey work where necessary).
- Identify species which are poorly represented in the current site series and the likely reasons for this, and recommend appropriate action.

Species data needed

- Site citations, with qualifying species for each site.
- Species interest on sites (at individual species level and higher level groupings, e.g. waders).
- Species covered by legal and other status.
- Corporate targets for species.

4.2.8. Promote public awareness and understanding of species issues

This is a general educational function, but a significant amount of the work relates to species. Although listed as a national function, and the proactive work is almost exclusively national, local staff are also involved in responding to ad hoc local enquiries.

Main tasks involved

- Answer ad hoc enquiries from wide range of sources.
- Produce educational materials (e.g. Fact Sheets, Data Support Sheets, general publications).

- Raise general awareness of wildlife issues and enjoyment of the countryside at a very broad level.
- Promote enlightened land management.
- Specific project work (e.g. wildlife gardening project).

Species data needed

As the data for this work area is provided by SNH as experts in the field, it is essential that it is fully accurate. It is difficult to predict what information will be needed as the reactive response work could relate to almost anything. Information needed is likely to include:

- Individual species data (at various levels of detail) such as general ecology, distribution and population.
- Species present on a given site.
- Recommended management for a given species.

5. SUPPLY OF SPECIES INFORMATION

This section describes the main suppliers of species information and the types of information they provide. It discusses the strengths and weaknesses of current arrangements, and then goes on to look at general issues and opportunities. The main flows of species data are represented in a series of Data Flow Diagrams (Appendix C).

5.1. Sources of information

For most of the functions described in the previous section, staff use species data from a variety of sources. One very clear pattern that emerged is that the same sources and types of data are used for a wide range of purposes. The following is a summary of the main sources of information used.

5.1.1. Biological Records Centre (BRC)

This data source is used almost exclusively by national specialists. Much of the use is for specific enquiries within the terms of the contract[6] between BRC and the Country Agencies. It contains distribution and population information for many species, and also some information on trends in populations, particularly for commoner species. Requested information is provided either electronically or on paper, depending on the type and volume of data. Use is also made of the atlases published by BRC, e.g. the Flora and Scarce Plant atlases.

Strengths

Those who use BRC find it valuable because it is a single central repository of species information which provides a national overview. The trend information is not readily available elsewhere. Most users find the response time (typically a few weeks) to be adequate for many purposes. The atlases are found to be useful because they are comprehensive and readily accessible.

Weaknesses

Some staff find the response times from BRC to be too slow, and none can use this source for work requiring a rapid response. A direct link to BRC databases would resolve this situation, and has been agreed in principle[7].

The data are largely used by national specialist staff, and are rarely used in the operational work of local staff. Data collection could be better focused on the needs of local staff, and they also need to be given direct access. In particular, they need to be able to query data spatially, which needs both more accurate spatial references and a tool to support such queries.

There are gaps in the data, which fall into two categories:

a) Gaps in species records - coverage is poor for more "obscure" species. Invertebrate specialists face the worst situation in this respect, although the problem is not unique to BRC and merely reflects the balance of data in existence. Generally, coverage is better for rarer and more protected species.

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[6] P.T. Harding et al. (1996). Support for the Biological Records Centre 1995/96: Third Annual Report, Part 1 - General services and output. ITE

[7] ITE. (1995). Scoping Study into Linking the Conservation Agencies and the Department of the Environment to the Biological Records Centre. Report No. 186. JNCC.

b) Gaps in geographical coverage - because much information is collected by volunteers, records tend to be concentrated around centres of human population. Little information is available for certain sparsely populated areas.

Both of these types of gap mean that some species may be regarded as rare simply because of under-recording.

A further limitation is that much of the data has only a 4-figure grid reference, and is therefore of little use for site-related work. To be useful, it needs either a 6-figure reference, or to be linked to a specific statutory site. There are still areas of work where only a 4-figure reference is used (e.g. the new *Atlas 2000*[8]).

5.1.2. JNCC

The types of data held by JNCC are similar to those held by BRC, consisting of major national datasets, including the Wetland Bird Survey (WeBS) database, Seabirds at Sea database and Seabird Colony Register, the Marine Nature Conservation Review (MNCR), the Invertebrate Site Register (ISR) and the Rare Plants database. The purposes for which these datasets are used are also similar and the management of the datasets is due to be transferred to BRC or the British Trust for Ornithology (BTO) as appropriate in the near future.

Strengths

As with BRC data, the JNCC datasets support national specialist staff by providing a comprehensive national overview of distribution and populations for the species that they cover. Spatially-referenced and site-related datasets are particularly useful. For some datasets (e.g. WeBS, MNCR), staff have direct access to an electronic copy held at SNH which is updated regularly.

Weaknesses

These are very similar to those applicable to BRC. Usage is almost exclusively by national specialists and the data collection is not necessarily carried out with regard to local requirements. There is no direct access available for local staff, so any local use of the data is indirect, through questions to the relevant national specialist.

The same types of gap exist in the data as for BRC, although this is less of a problem for bird data than for other groups because of the very comprehensive recording schemes in place. The ISR is known to have significant gaps, and possible inaccuracies in some of the data.

Although the MNCR database is directly accessible, it is not easy to use on its present software platform (Advanced Revelation).

5.1.3. SNH local staff

Local staff are the main source of up to date information on local and site-related issues. Apart from day to day exchange of information with immediate colleagues, they provide this to national staff where required to support work at the national level, such as selection of sites for an international designation.

[8] P.D. Dines. (1996). Atlas 2000 Instruction Booklet. BSBI.

National staff may also consult local staff where an issue is of particular importance in their area.

Strengths

As SNH's representatives "in the field", local staff provide the best available source of information on the current status of sites and broader issues affecting the local area. Much of the information needed is very familiar to them, so they are able to provide a rapid response without reference to files or other sources. It is often very detailed and may be built on years of experience of a particular area.

Weaknesses

Because much of the information is not documented, it relies entirely on the particular members of staff involved. When they leave or retire, much valuable information is lost to SNH. A further problem is that the communication links are ad hoc and sometimes absent. This can be a problem where national specialists are unaware that local staff are involved in a particular issue, but even more so where the links are between local staff in different teams. It is likely that there are different areas facing similar issues, but the expertise is rarely transferred between areas. In some cases the process is assisted by regional staff acting as a co-ordination point, but generally the links work only through personal contacts.

5.1.4. SNH specialist staff

The main role of the specialist staff is to provide expert advice and a picture of the national context to local areas, and to co-ordinate their work, for national reporting requirements and international obligations, as well as providing a national context for casework. The main types of information provided are specialist advice on a particular species, including its status at the national and international levels, and advice on management. Specialist staff also provide standards for monitoring and targets; this is a growing area of work in the light of the new monitoring programme and the requirements of the Habitats and Species Directive.

Strengths

As the national experts in their respective specialisms, these staff provide the main co-ordinated source of national context information available to local staff. They can provide a rapid response to enquiries, and there is a high degree of confidence in the information they provide. Communication between these national experts appears to work well and there is a clear understanding of who is responsible for what. Where they do not have the necessary information to answer a question, they can provide links to outside experts through professional contacts.

Weaknesses

Some local staff are unclear on who they should contact nationally for certain issues. As with local staff, the communication can be ad hoc and depends on personal contacts. In some areas the information exchange can be slow where national specialists have received data relating to a site and this does not filter down to the staff responsible for that site.

5.1.5. In-house databases

The in-house corporate databases relating to species are currently in a state of transition, and are little used at present. Some staff continue to use COREDATA to hold basic information about SSSIs and the features for which they are notified. COREDATA will shortly be replaced by MIDAS (Management Information on Designated Areas in Scotland), which will later be linked to a new monitoring database.

Another major development planned for the near future is the provision of local GIS to all staff. This will provide at-desk access to background information such as SSSI boundaries and national species datasets, which will provide a context to local staff. Most local staff envisage that this will be of benefit in providing them with contextual information, and also as a means of accessing local data by location, which is the main type of access required for most local work.

Various local databases exist for particular subjects, but these are fairly specific and not a major store of species data.

Some staff make use of the Recorder package. They use its species dictionary as a standard, and enter their own local records which they can then retrieve for future use.

Strengths

Although little use is made of databases at present, most staff envisage significant benefit in making existing information available electronically, provided this is done to agreed standards. Much time which is wasted in searching numerous sources could be saved by having a single source. Better use could be made of experts' time if local staff could access national data directly and only make contact if further interpretation were required. There is also scope for better exchange of information between local staff in different areas; with a common electronic source, staff could access information about sites and species in other areas facing similar issues to their own.

Weaknesses

For COREDATA, the species component of the data is of little value as it was not input to the standards required for a species record, e.g. it has no date or source for the record. As such, the present data can provide only an indication of the species which may occur on a site and further research is needed before any reliance can be placed on it.

During the present transitional stage, staff are unclear as to where they should be inputting species records and are concerned about duplication (e.g. between COREDATA and Recorder).

5.1.6. In-house paper records

This source is defined as including internal files, survey record cards and similar paper sources, but not more formal published sources, which are discussed separately as Literature. Paper records constitute a major holding of data and some of the most regularly used data are held in this form, particularly in local offices. The main examples are local site and species files, including background

data such as citations and site management statements, and more regularly updated information such as casework correspondence. However, there is also a significant proportion of paper data which is not used to great extent, such as historic survey data.

Strengths

The main advantage of this source is that it is readily available for both access and adding new information, and can be structured to meet the specific needs of the members of staff using it. For many areas of work, especially in local offices, it is the most up to date source, so staff regard the data as reliable.

Weaknesses

One of the major problems with this type of information is that there is no single clear method of filing and accessing it. Depending on the task in hand, it may be required by site, species, or other factor such as by issue or by name of owner/occupier. This means that files must either be cross-referenced extensively, which is time-consuming, or information must be copied and filed in multiple places. There is little consistency between the filing systems used in different offices, and sometimes between different staff in the same office. As a result, staff often fail to find all relevant information or rely on remembering that it exists. This is a problem particularly where staff need to access information produced by others. If this type of information were held electronically according to a set of agreed standards, much time would be saved in finding information and more flexible access would be possible.

A further problem is that paper information is not secure, and it is believed that an unknown amount of valuable historic data may have been lost or destroyed in the course of the various organisational changes. This is compounded by the current archive policy, which recommends that files should not be held for more than two years. While this may be advisable for some types of species-related information such as historic casework correspondence, it is not appropriate for baseline survey or monitoring data where the aim is to build a picture of change over time. An example of the sort of problem a short-term retention policy can cause was brought out during the interviews: a set of original baseline habitat survey data from the 1950s was nearly destroyed in error by a member of administrative staff following the archive policy without understanding the nature of the data.

5.1.7. Voluntary bodies

This category comprises a range of sources from very large national organisations such as RSPB to small groups specialising in a particular locality or species. It also includes individual amateur naturalists. Records held by many of the other sources listed here may also originate from volunteers. It is generally accepted that the voluntary sector provides the majority of biological records in the UK and overall is an extremely valuable source. The type of information received is usually records of species being observed at a given place and time by a particular person, with a variety of other information dependent on the species and recording scheme. The quality and data management standards for this data varies from extremely good to very poor, so it is essential for SNH to know the reliability of a given source and the standards that have been applied.

Strengths

This source has the major advantage that it can provide large volumes of high quality data at very low cost, which could never be produced if it had to be funded commercially. For some species groups, the voluntary sector constitutes some of the highest level of expertise in existence. Where a well-defined methodology exists, the data can be of equal standard to what would be obtained commercially, and provides wide geographic coverage and time-series data. A further advantage is that by using the data collected by volunteers, SNH is able to create a feeling of involvement and commitment to nature conservation amongst a large number of people.

Weaknesses

Because the collection of this data is entirely voluntary, it tends to be patchy both in species groups covered and geographical coverage. It is widely recognised that many species distribution maps tend to reflect the distribution of recorders rather than of the species itself. In terms of species groups covered, there are far more records for "popular" species such as birds than for more obscure groups, some of which have virtually no data. Another issue relates to the methods of collection. While the major data holdings, such as bird records, are collected according to well-established methods, data from some of the smaller sources must be interpreted carefully and the method used must be understood. For example, the method may determine whether a species is not recorded because it was not found or because the survey did not include that species.

A potential problem with this source is that much of the work is done by a relatively small number of experts, many of whom are nearing the end of their biological recording careers. There is no equivalent new "generation" to continue the work, and this is regarded by many as a time-bomb where there will be a sudden shortage of voluntary recorders with the necessary expertise. SNH could take some action to address this by actively providing training and support to new recorders, possibly as a joint initiative with BRISC (Biological Recording in Scotland Campaign).

5.1.8. Local Records Centres

These centres hold biological records relating to the local area. They cover most species groups, although birds are a lower proportion of the records than other groups, being well covered elsewhere. They may be a collation point for records from local recorders, published surveys and historic data. In practice the amount and quality of data held varies greatly between different centres, and some areas of Scotland do not have a Local Records Centre at all. At present, it is only in Fife that SNH staff make significant use of this data source. Here, SNH staff have close links with the centre and make considerable use of its data for local site and species-related work. In most other areas, even where Local Records Centres exist, they are often under-resourced and unable to respond to requests for information.

Strengths

The example in Fife shows the potential benefits that could be gained from this source. A well-resourced Local Records Centre can carry out much of the data management of records for the local area and act as a single collation point, thus

reducing the time that SNH staff need to spend searching for information and allowing more time for its interpretation. The possibility of using Local Records Centres in this way is one of the main strands in the Millennium Bid (see Section 5.2.6).

Weaknesses

At present, there is a poor distribution of Local Records Centres in Scotland, so this source is not open to most SNH local offices. The arrangements for management of the centres are variable; Fife has full-time staff and the support of its local council, within which it is situated, but this is the exception and most centres tend to depend on volunteers and have few resources at their disposal. This includes a lack of computing capability, so much of the data resource is in paper form only and thus subject to the same limitations as discussed in the Section 5.1.6. Much of the information is provided by volunteers, so may also have some of the problems described in Section 5.1.7. There is also the risk that the Millennium Bid will not be accepted; in this instance, many of the recommendations made in this report would still apply, but SNH would need to provide a greater level of support to Local Records Centres in order to get the benefits of their data management capabilities.

5.1.9. Government departments, agencies, universities, museums and other research organisations

There is a range of external organisations involved in collecting species data of various types for their own purposes, and some of these are used by SNH. There are many instances of this, such as pollution data from the Scottish Environmental Protection Agency (SEPA) or seal data from the Sea Mammal Research Unit (SMRU). Museums have a role in providing an high-level inventory of species, and the Millennium Bid sees a lead role for the Natural History Museum in providing checklists of the status of UK species. This is needed at the Scottish, regional and local level as well as UK. A wide variety of information is received from these sources overall, but each individual source tends to be used for a fairly specific subject.

Strengths

The data provided is generally regarded as being reliable and consistent. It is usually collected with a clear purpose and according to well-defined standards established by the institution concerned. Most of these organisations are able to provide the data to SNH promptly as they have good access for their own purposes. At least some of information held by these institutions is well-known and documented, so even new staff know for which subjects to contact them.

Weaknesses

Any one source will normally have data on only a few subjects of relevance to SNH, so for issues requiring a wide-ranging response it is necessary to contact many different sources. Furthermore, since these institutions are collecting the data to serve their own purposes, it may not contain all the details SNH would like or be in the required format.

5.1.10. Literature and commissioned research

This source includes all published literature such as books and journals, as well as in-house reports and commissioned research. These can cover any species-related topic and are widely used. Some are the published output of data available on databases, e.g. the BRC atlases. For some areas of work, research may be specifically commissioned to fill a gap in the existing data.

Strengths

Publications are normally readily available for consultation, and many staff regard their most useful sources of information as those that are "on my shelf". The information is generally of high scientific standard, and in the case of commissioned research it is specifically tailored to SNH's requirements.

Weaknesses

Reports and books cannot be searched easily for information on a particular subject, and since few staff are able to spend time reading current literature or even abstracts, they may be unaware of relevant reports. As with other types of paper information, they are not robust and in some cases there is only one copy available which may consequently have restricted access. For many types of information, they rapidly become out of date; this includes the BRC atlases, which cannot reflect the updates to the database from which they were derived.

5.1.11. Experts and professional contacts

This source was mentioned by every single member of staff consulted in the study, often being the first source cited. It includes any individuals who are specialists in particular species-related topics, and the role is independent of which organisation they happen to work for (which may be SNH). It depends heavily on a network of professional contacts who provide each other with expertise in response to ad hoc requests.

Strengths

This source provides some of the best information as the people involved are the leading experts in their particular field. It is generally easy to obtain information from them as they can be approached directly in response to specific queries, and it is well known who the relevant experts are for a given issue.

Weaknesses

To use this source effectively, staff need to be able to contact the relevant experts on an ad hoc basis. Because the arrangement operates as an informal network depending on personal contacts, this has worked well for longer-serving members of staff, but for those who are newer to SNH, and possibly not from a biological background, it can be more difficult to approach a top expert with a request for information. A further problem is that the information is gathered for a specific purpose but is not then easily accessible for future reference or for use by other members of staff.

5.2. Issues and opportunities

5.2.1. Types of data used

The staff consulted in the study identified a range of types of species data that they use. The main categories are as follows:

- Distribution
- Abundance
- Site-specific details - presence and numbers
- Ecological background
- Inter-relationships - between species, habitat associations etc.
- Long-term trends and the reasons for them
- Legal status
- Management - best practice
- Metadata

These types of information are needed at a variety of scales, from detailed local information up to high level summaries. They are vital for species-related work and reporting on state of the natural heritage, and an important point to emerge was that information is generally multi-purpose, i.e. most functions will use most of these categories at some time. Most staff use most of these categories for several areas of work, and are unable to give more specific purposes for data. This general trend also applies when considering the scale of information; both detailed and summary information are used by a wide range of functions, while the same function may need different levels of detail. For example, commenting on a planning application requires detailed local information on the presence of species on a site, its ecology and the likely impacts of the proposal, but also higher level information on its status locally, regionally and nationally.

The only clear division of usage to emerge was by species group, e.g. invertebrates, but this merely reflects the structure of SNH with species specialists, and the types of work carried out are similar across different species.

This pattern is potentially in line with the Biodiversity Principle "to record, check and store once and access many times for many purposes"[9]. However, this depends on ready access to information, which is discussed in the following sections.

5.2.2. Limitations of data availability

There are three possible reasons why data are not available to staff for a particular task:

a) It does not exist
b) It exists but is not widely known to do so
c) It exists but cannot be obtained within the necessary timescales.

The first problem is encountered by nearly all staff, and is generally associated with particular species groups. The existing data are patchy, varying from very good for some groups, such as birds, which have large reliable datasets, to little or

[9] Department of the Environment. (1995). Biodiversity: The UK Steering Group Report. Volume 1: Meeting the Rio Challenge. London, HMSO.

no data for others, such as certain invertebrates. The best information tends to be for the most protected and rare species, and those with a high public profile and high interest among volunteer data recorders. For more obscure species there may be only a very small number of people capable of identifying them, and the data may be many years old. In general, less data exists for the marine environment than for terrestrial.

The second problem is even more widespread; it appears that much of the species data in existence is very little known. One of the most common complaints about species data is the difficulty of finding information and the multiplicity of sources that need to be consulted. Even within SNH, there are often good sources which are not widely known. For example, national specialists may be unaware of locally commissioned surveys, while the local staff regard these as site-specific and not relevant to anyone else, so do not publicise them. Many staff believe that there are probably many other sources of data which are not used because they are not known. In practice, they normally find a few good sources of data for a particular purpose and do not have time to investigate other possible sources, even where these might have better information.

Where no information source is known, experts are often used as a reference source. This arises particularly when staff are consulted about an area with no statutory designation and little information available. In this situation they will often make a "best guess" at the type of interest likely to be present and contact the relevant experts for details. This can mean that much of an expert's time is taken up with simply reporting what is there, rather than providing interpretation as to what it means. It is likely that there are often other important species present which get overlooked by this approach.

This lack of knowledge of what data exists makes it more difficult to tackle the previous problem of data gaps; without knowing the existing resource, it is difficult to set priorities for obtaining missing data.

The third problem, the difficulty of obtaining data, is also common and has two main causes:

a) Impracticality of obtaining data within the time available

Even where good sources of data are known to exist, these cannot be used for time-critical work unless they can provide a rapid response. This is less of an issue with planned work such as statutory reporting with known timescales, but for reactive work with a short timescale, such as casework, the preferred sources are those most readily available such as local files and reports.

Data may take time to obtain for various reasons. Commonly, it does not exist in the required format. An example might be a question on grasslands within an area, where the only data are filed by individual site or species and so need to be manually collated. Not only is this time-consuming, but it also relies on staff already knowing which are the grassland sites, which may be a problem for new members of staff.

Secondly, many providers of information are voluntary or semi-voluntary, either groups or individuals, and are often poorly resourced. They may lack the staff to be able to respond to requests for information within short timescales. This is clear from the contrasting situations of the well-resourced Local Records Centre in Fife, which is consulted extensively by SNH and able to provide much useful information, and centres in other areas which are little used because they lack the resources to respond to enquiries.

A related problem is that the arrangements for obtaining data from these sources are often very ad hoc and dependent on good will. Although this can work well where relationships are good, it also means that there is no mutually agreed response time between SNH and the data supplier. Staff facing a deadline may therefore be unsure whether it is worth trying to obtain information from a given source. This could be improved by clearer agreements with information providers as to what response time can be expected, particularly with larger sources such as BRC, where staff had very variable experience of response times (ranging from a few days to several months).

b) Refusal by the owner to provide it

The third main reason why existing data may not be used is that whoever owns the data is unwilling to provide it to SNH. The issues surrounding this are discussed in Section 5.2.5.

5.2.3. Reuse of information

Much of the data gathered by SNH is used for a particular purpose, but could potentially be useful for many others. A common example of this is casework, where staff work on a particular problem in a given area and produce a response, but this information is then "lost" to the organisation as it is rarely used again. If it were more accessible, staff from other offices facing a similar issue could look at what is already known and use this as a starting point.

As long as such information is held on paper only, it will remain difficult for other staff to access it or even know of its existence. Greater use of electronic media could improve this as other staff would then be able to search by topic. With the computer network and PC infrastructure already in place, there is considerable potential for SNH to gain greater value from its information. The new site database, MIDAS, and the planned monitoring database, SCMS, could both be used in this way to allow staff to learn from work in other teams, and in future this could also apply to a casework database.

For such an approach to succeed, it is essential that standards are used for recording any topic that staff might want to search by. This would include an agreed species dictionary, higher level groupings such as waterfowl, standard categories for management, activities and other topics by which data might need to be summarised. Clear priorities are needed so that the investment in infrastructure is used to best effect and is seen to yield early benefits.

Local staff in particular have a requirement for information about particular sites (statutory or otherwise), and at present many of the national site-related species datasets are not available locally. This is another area where measures are already

in place to address the problem, as staff are being provided with local GIS facilities which will allow them to query by location. If national datasets are indexed geographically, local staff will then be able to access them. Conversely, national specialists will be able to access local records and add to the national picture of species distribution.

Some staff are making use of the internal bulletin board Team Forum to exchange expertise, and most who do so find it useful. This has potential for greater use, particularly if it had an indexing system to allow access to previous correspondence by topic, allowing staff to consult it when they had an issue to investigate.

5.2.4. Channels of communication

A general issue with information flow is that many staff are unclear as to who they should "officially" contact on a particular topic, both within and outside SNH. The flows of information between local and national levels are unclear, with some staff using regional co-ordinators and others going directly to a personal contact. This can be problematic for new staff, and also means that there is no full list of who is involved with a particular species or issue. Many staff would value a list of contacts and experts, in-house and externally, by subject area.

5.2.5. Data ownership and security

There are problems in obtaining some information where the owner is unwilling to supply it. Most commonly, this is due to concerns about security, particularly in relation to "sensitive" species such as rare plants, raptors or badgers. There is little consistency in this; some local branches of organisations will supply data to their local SNH office while others will not, and this generally depends on the relationship between the individuals involved. Such blockages can be detrimental to the species involved; an example was given where SNH was consulted on a proposed Woodland Grant Scheme and raised no objection, unaware that there were buzzards nesting in the area because the local raptor group had refused to provide any data. The situation could be improved by giving such groups better feedback on the uses to which their information is put; the problem arises in part because they have never seen any benefit in providing data to SNH. Better communication about positive uses of the information might increase willingness to supply it.

With some groups, it might be appropriate to draw up a security agreement, so that there is a clear statement of why the information is needed, the purposes for which it will be used, who will be allowed access to it, and the security measures in place.

The other main reason why some organisations refuse to supply information to SNH is because they regard it as commercially valuable and wish to charge for it. This is an increasing problem as organisations, particularly Government agencies, research bodies and academic institutions, are under pressure to recover their costs. Information which used to be freely obtainable must now be paid for, even by non-profit-making bodies. It can appear bureaucratic when SNH pays another organisation for data, and then in turn charges them for SNH's data. Where there

is two-way exchange of data, it could be quicker and simpler to draw up reciprocal agreements without the need for charging.

5.2.6. The Millennium Bid

The content of this proposal will not be discussed in detail here as there are already several documents available within SNH dealing with this. SNH's input to the bid has been guided by the consultation which has taken place on the draft *Biological Recording Strategy*[10] and discussions both within SNH and with colleagues in the other Country Agencies and the wider biological recording community. However, there are several aspects which could improve some of the problems discussed above.

First, the bid proposes the introduction of a network of Local Records Centres with a well-defined data management role. This would improve both quality and access to existing data as it would introduce a set of nationally agreed standards and a single point of contact.

Secondly, it would resolve many of the security issues as the proposed network would have a clearly stated policy on rights of access, confidentiality, uses to which data could be put, and similar issues. Owners of datasets would be aware of this policy and would need to accept it before contributing data. Obtaining agreement on such a policy will not be a straightforward task and many complex issues are likely to arise. However, by tackling it as an overall issue, it should be possible to prevent problems from arising case by case and being handled inconsistently as at present.

Thirdly, the network would bring together the local and national levels of data so that different scales could be used depending on current requirements. National specialists would be able to take an overview of data and then pick out individual locations of importance, while local staff could place their detailed information on a local site against background data on the national context of the site. This direct access would greatly improve the information flows between the local and national levels within SNH, as well as bringing in data from third parties.

Finally, provided that most of the significant data holders contribute their data to the network, this would solve the problem of having to use multiple sources to answer a given question. By drawing together existing data into a single repository, the project would allow the conservation and biological recording community as a whole to access information more efficiently and spend more resources on interpretation and appropriate action, rather than the significant amounts of time currently spent merely in locating information. It will also highlight where there are genuine gaps in the data (as opposed to data which no one can access) and allow resources to be targeted appropriately.

Despite all the foregoing potential benefits, the Millennium Bid must not be regarded as a solution for all the species information problems. There is no guarantee that the bid will be accepted, and in either case SNH will need to support Local Records Centres in their role as managers of biological records.

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[10] Scottish Natural Heritage. (1996). Biological Recording Strategy. Draft version 4.

6. USE OF SNH'S SPECIES INFORMATION BY OTHERS

In addition to considering the types of species information used by SNH, the study also looked at the ways in which other organisations make use of SNH's output data. In general, staff regard themselves more as users than as providers of information, but where SNH does supply data to others, the arrangement often works well and there is potential to increase the availability of data to others working towards nature conservation objectives.

6.1. Users of SNH data

The information produced by SNH falls into two broad categories: ad hoc advice such as responses to enquiries, and highly processed information such as survey and research reports and educational materials. In general, it is not a major producer of raw biological records, and those that it does create are rarely passed to others outside SNH.

6.1.1. Ad hoc advice

This category mainly comprises providing responses to statutory and non-statutory consultations, and advice to a range of enquirers, as discussed in Section 4. The information is nearly always provided in response to a request rather than proactively, and the recipients are not necessarily involved in supplying information to SNH (i.e. it is a one-way flow of data). The main types of recipient are:

- Local Authorities
- Government departments and agencies
- Students
- Researchers and consultants
- General public

6.1.2. Processed information

In contrast, the users of SNH reports and surveys are very often the same organisations that supplied the initial raw data. For example, a local Botanical Society of the British Isles (BSBI) recorder might provide plant records to SNH and in return receive a copy of the research report produced as the end product. The recipients of this type of data generally include most of the suppliers of data to SNH (see section 5), including the following:

- BRC
- JNCC
- Voluntary bodies
- Local Records Centres
- Government departments, agencies, universities, museums and other research organisations
- Experts and professional contacts

Educational information is targeted at particular groups, generally including the following:

- Students and educational bodies (including primary, secondary and tertiary education)
- Members of the public making an enquiry
- Voluntary bodies
- Land managers

- Visitors to NNRs
- Other groups targeted by a specific project, e.g. gardeners

6.2. Issues and opportunities

6.2.1. Availability of data

In providing data to others, the main problems experienced by staff are in obtaining the requested information, and all the issues discussed in Section 5.2. The ad hoc nature of the enquiries received can mean that staff are trying to answer questions on areas where they have little information, and since SNH are the official "experts" in the field of nature conservation, it is essential that any information provided is accurate. Many staff now have little time available for site visits and fieldwork, and feel that they may have less direct knowledge of sites than some of the people making the enquiries. This creates pressure on staff, particularly those who are new to an area, as they feel that they lack the necessary knowledge to meet public expectations.

6.2.2. Time taken

Some of the enquiries received can be very time-consuming to answer, and in certain cases staff find it difficult to achieve a balance between appearing helpful to enquirers and other priority areas of work. Requests for information can be very general and non-specific, and these can take time to answer.

6.2.3. Data confidentiality

Many staff are unclear about when they should release data to outside organisations, and there is considerable inconsistency in this between individuals within SNH. This ranges from making most data available unless there is a clear reason not to, to regarding nearly all biological records as confidential and not to be released. As with other areas, it often depends on the individuals involved and whether there is a relationship of trust, but a clearer SNH policy on this would help. The situation could otherwise arise that a third party is refused SNH by one member of staff and readily given it by another.

This area is further complicated by the several pieces of legislation relevant to the release of information, including the Data Protection Act, the Environmental Information Regulations and the Open Government initiative. Many staff are unsure of the legal position regarding release of data, and this is particularly problematic where the original data provider is unknown and so cannot be asked for permission for release. Staff are also unclear on the policy with regard to charging for information. There appears to be a need for clarification on the organisation's position on data release. A set of guidelines for staff is in preparation.

7. SUMMARY OF RECOMMENDATIONS

The following is a summary of the recommendations made in this report. These actions are necessary to support SNH's needs for species information (see list in Section 5.2.1). Wherever there is action already planned or in progress towards meeting one of these recommendations, this is noted. Also given is an indicative timescale, showing whether the recommendation should be implemented in the short, medium or long term.

Action	Timescale S/M/L-term
1. SNH staff, both national species specialists and local staff, should be provided with a direct link to BRC databases, including those due to be transferred from JNCC. *Action in progress*: This has already been proposed in the *BRC Scoping* Study[11] and agreed in principle[12].	S/M
2. SNH should influence national recording schemes, including BRC-held data, to use a 6-figure grid reference on all records. *Action in progress*: The principle of the need for standard spatial references is widely accepted, and this could be formalised in the data standards proposed under the Millennium Bid.	M/L
3. A standard species dictionary should be used, probably based on the Recorder dictionary. *Action in progress*: This issue is being addressed as part of the Millennium Bid, which will introduce a standard for use by the whole biological recording community.	S/M
4. SNH should provide proactive guidance to Local Records Centres on the type of data needed and the standards to use, taking Fife Nature as a model. Encouragement should be given to other organisations whose data SNH uses to contribute data to these centres. *Action in progress*: This is being taken forward by the Millennium Bid, which proposes a network of such centres with standards for data management. However, the action is still needed even if the Bid is not successful.	S/M
5. Staff should be given clear guidance on how and where to record species data gathered in the course of their work. *Action in progress*: A paper form is being introduced for monitoring data (mainly for records on SSSIs).	M
6. The requirement to archive data more than two years old	S

[11] Institute of Terrestrial Ecology. (1995). Scoping Study into Linking the Conservation Agencies and the Department of the Environment to the Biological Records Centre. T.J. Moffat. Report No. 186, JNCC.
[12] P.T. Harding et al. (1996). Support for the Biological Records Centre 1995/96: Third Annual Report, Part 1 - General services and output. ITE

should be reviewed with respect to baseline survey and monitoring data, where a historic picture is essential.

7. Clear guidance should be provided to staff on SNH policy on release of data and the legal position. Failure to release data when required, or release of data which should have remained confidential, could leave SNH liable to legal action, so audit procedures should be put in place to ensure that correct action is being taken. S

Action in progress: Draft guidance is currently being prepared.

8. In-house national databases should be accessible by local staff. S/M

Action in progress: The infrastructure for this is being put in place, with the network now installed.

9. Staff should have the facility to access the national datasets spatially. The spatial reference should be used as a common index, to allow staff rapid access to all the available information on a given location. S/M

Action in progress: The infrastructure for this is being put in place, with the network and introduction of local GIS.

10. SNH should provide proactive guidance to volunteers on the type of data needed and the standards to use. Where necessary, training and support "in kind" should be offered to volunteers in exchange for data. S/M

Action in progress: This has been proposed in the draft *Biological Recording Strategy*[13].

11. Specific gaps in the data, both in species groups and geographic coverage, should be identified so that priorities can be set for future data collection. M

Action in progress: A study has already been proposed in the *Biological Recording Strategy*[14] to investigate the geographic and taxonomic extent of biological recording coverage in Scotland.

12. SNH should consider developing a standard method of recording casework electronically, which would allow query by site, species, issue, management, organisation and similar categories. Staff should be able to query data across all sites and regions. M

Action in progress: A Casework database is one of the IS Implementation Programme initiatives.

13. A strategic policy decision should be made on which types of information should be computerised and which held on paper in the long term. For paper data, standards for filing should be introduced, with a structure based on the main ways in which staff need to M

[13] Scottish Natural Heritage. (1996). Biological Recording Strategy. Draft version 4.
[14] Scottish Natural Heritage. (1996). Biological Recording Strategy. Draft version 4.

retrieve data.

Action in progress: A research project has been proposed for 1997/98 to pilot computerisation of key local species data from the office files of two areas.

14. Paper reports should be better indexed, with a single on-line catalogue of reports by subject. M

Action in progress: Some work to provide metadata on surveys has been undertaken by regional staff.

15. Agreements should be drawn up for the exchange of information between other organisations and SNH, to cover issues such as response times, security and charging policy. M/L

Action in progress: This will be done as a standard for all organisations participating in the network proposed by the Millennium Bid. (Even if the bid is unsuccessful, it would be desirable for SNH to develop a joint approach rather than reaching bilateral agreements with other organisations).

16. The use of Team Forum for informal exchange of ideas and best practice should be promoted, and procedures drawn up for management of the information provided. S

Action in progress: This is already being used to a limited extent. Procedures should be drawn up with regard to subject areas where it currently works well.

17. Staff should be provided with on-line access to a list of contacts and experts (both within SNH and external) for particular topics (although queries to external advisors may need to be channelled through a single point of contact). S/M

18. Where SNH has made positive use of data received from a third party, this should be fed back to the provider and formal acknowledgement made. S/M

19. SNH should press for the migration of the MNCR data onto a more standard technical platform with greater ease of use. M/L

20. A set of standards should be developed for electronic querying of data, such as standard categories for activities occurring on sites, or species management methods. These standards should recognise the full range of uses to which a given set of data can be put, and not be specific to a single application. L

APPENDIX A

List of interviewees

The author would like to thank the following people for their time and helpful contributions to the study. (All are members of SNH staff unless otherwise stated.)

Stuart Ball (JNCC)
John Baxter
George Boobyer (JNCC)
Phil Boon
Ewen Cameron
Dave Chambers
Mairi Cooper
Niall Corbett
Neil Cowie
Sue Davies (JNCC)
David Downie
Peter Duncan
Willie Duncan
Lynne Farrell
Adrian Fenn
Vin Fleming
Julie Forrest
Martin Gaywood
Paul Harding (Biological Records Centre, Monks Wood)
John Harrison (Scottish Borders Local Records Centre)
Julian Holbrook
Ross Johnston
Pete Kinnear
John Kupiec
Lyndsey Kinnes
Ed Mackey
Jane Mackintosh
Katrina Marshall
John McKinnell
Chris Miles
Emma Philip
David Phillips
Richard Pollitt
John Ralston
Rob Raynor
Helen Riley
Bob Saville (Lothian Wildlife Information Centre)
Phil Shaw
Ros Smith
Anne-Marie Smout (Fife Nature)
Kenny Steel
Chris Sydes
Pip Tabour
Stephen Ward
Lawrence Way (JNCC)
James Williams

APPENDIX B

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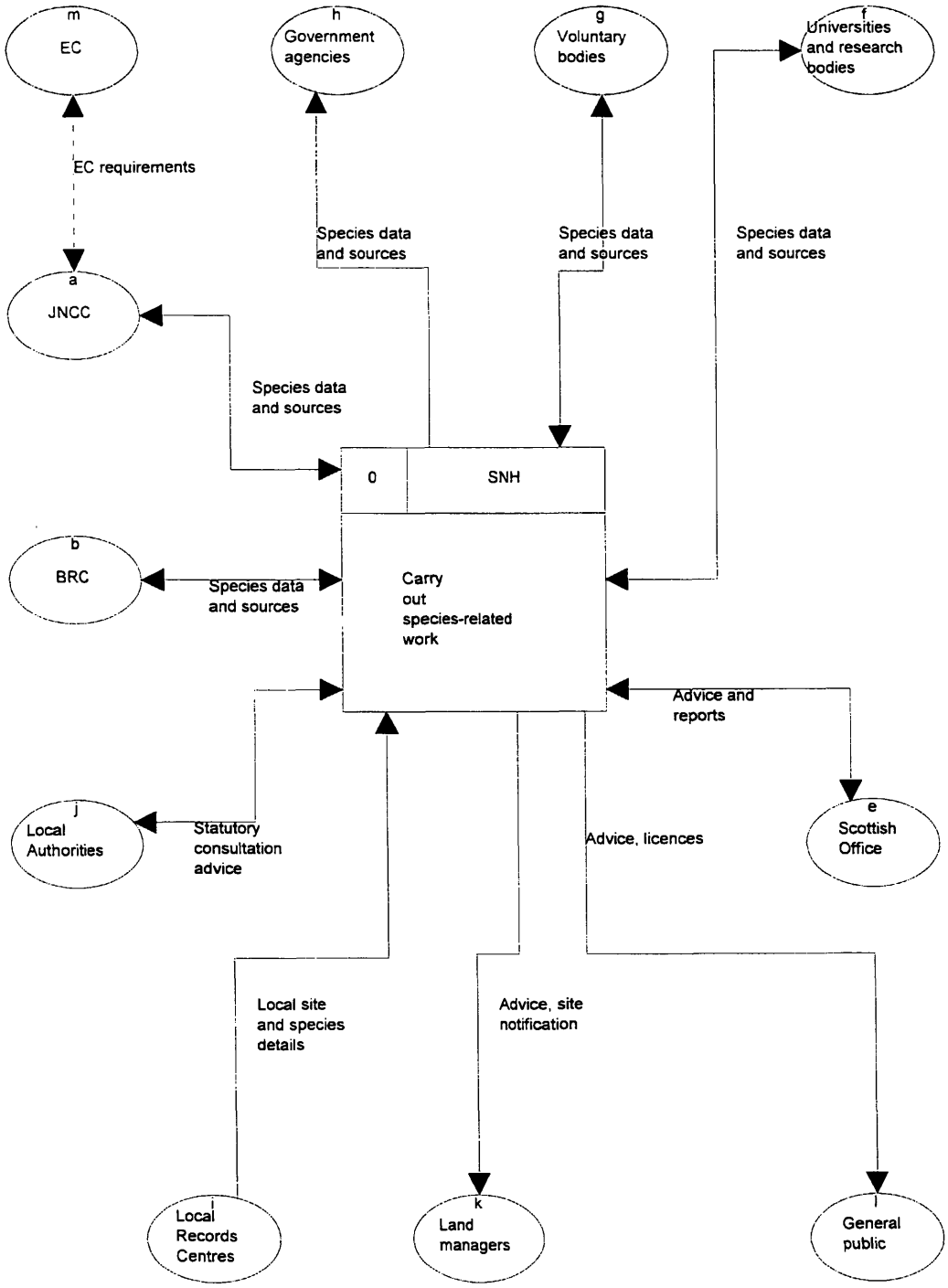
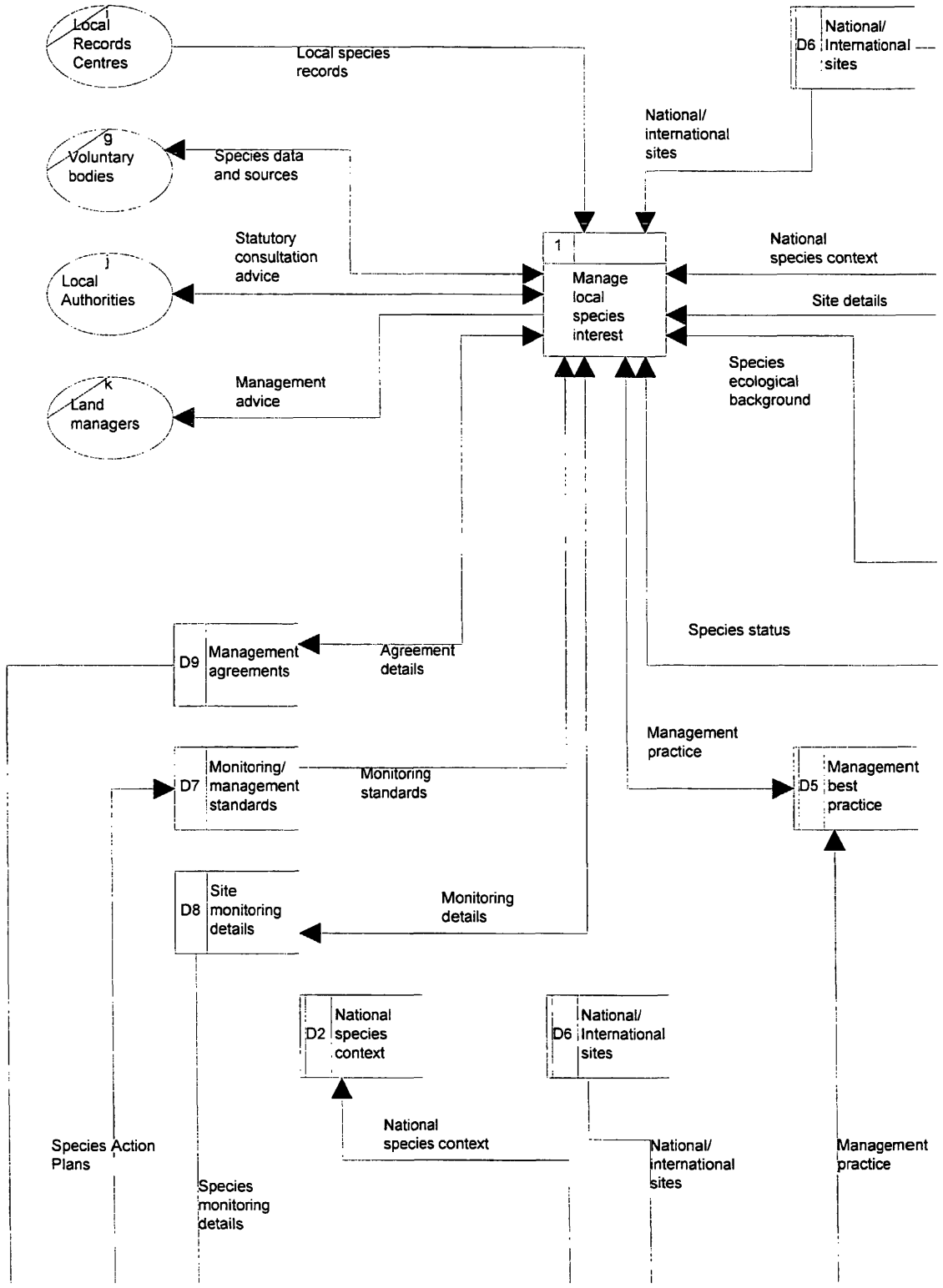
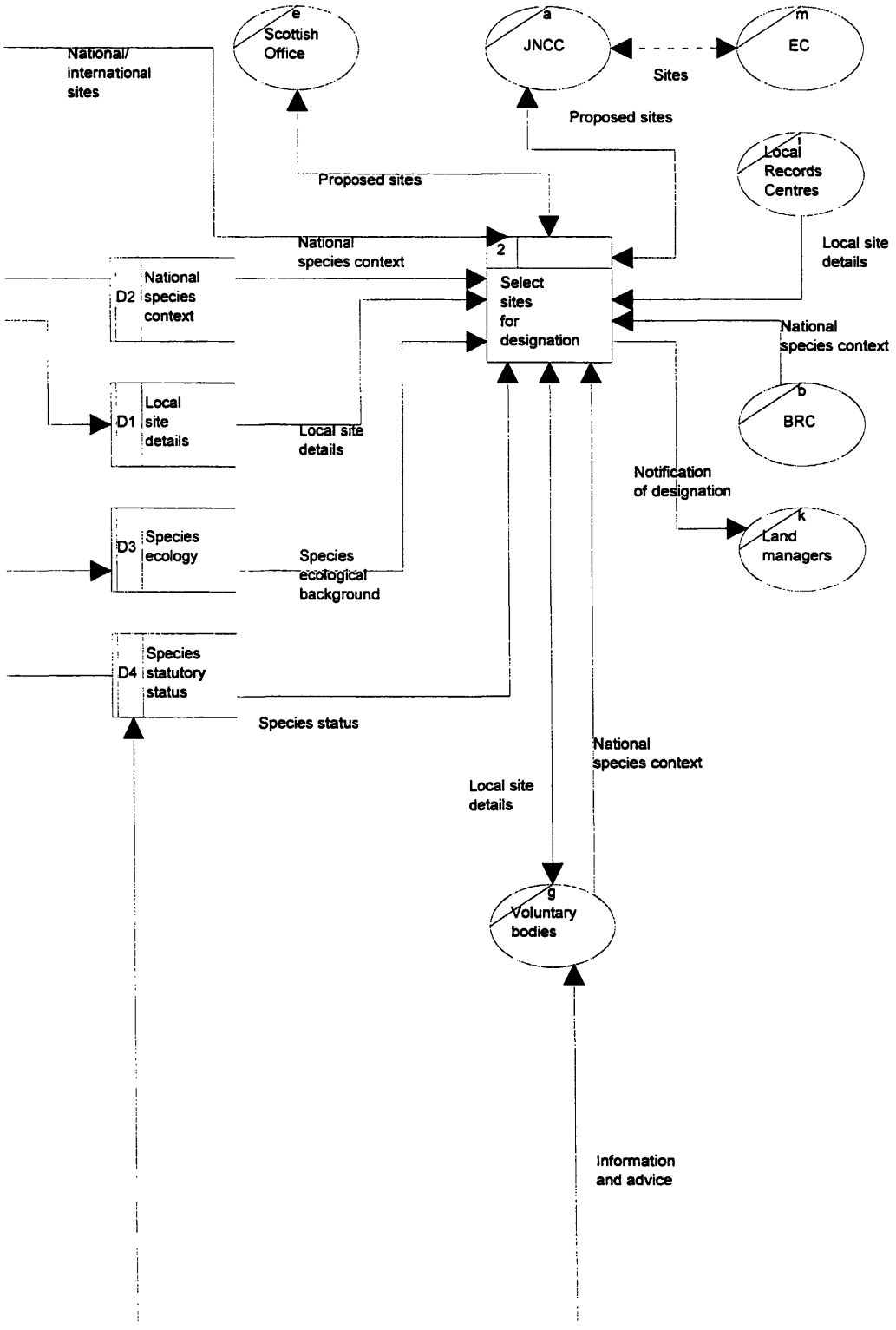
APPENDIX C Data Flow Diagrams

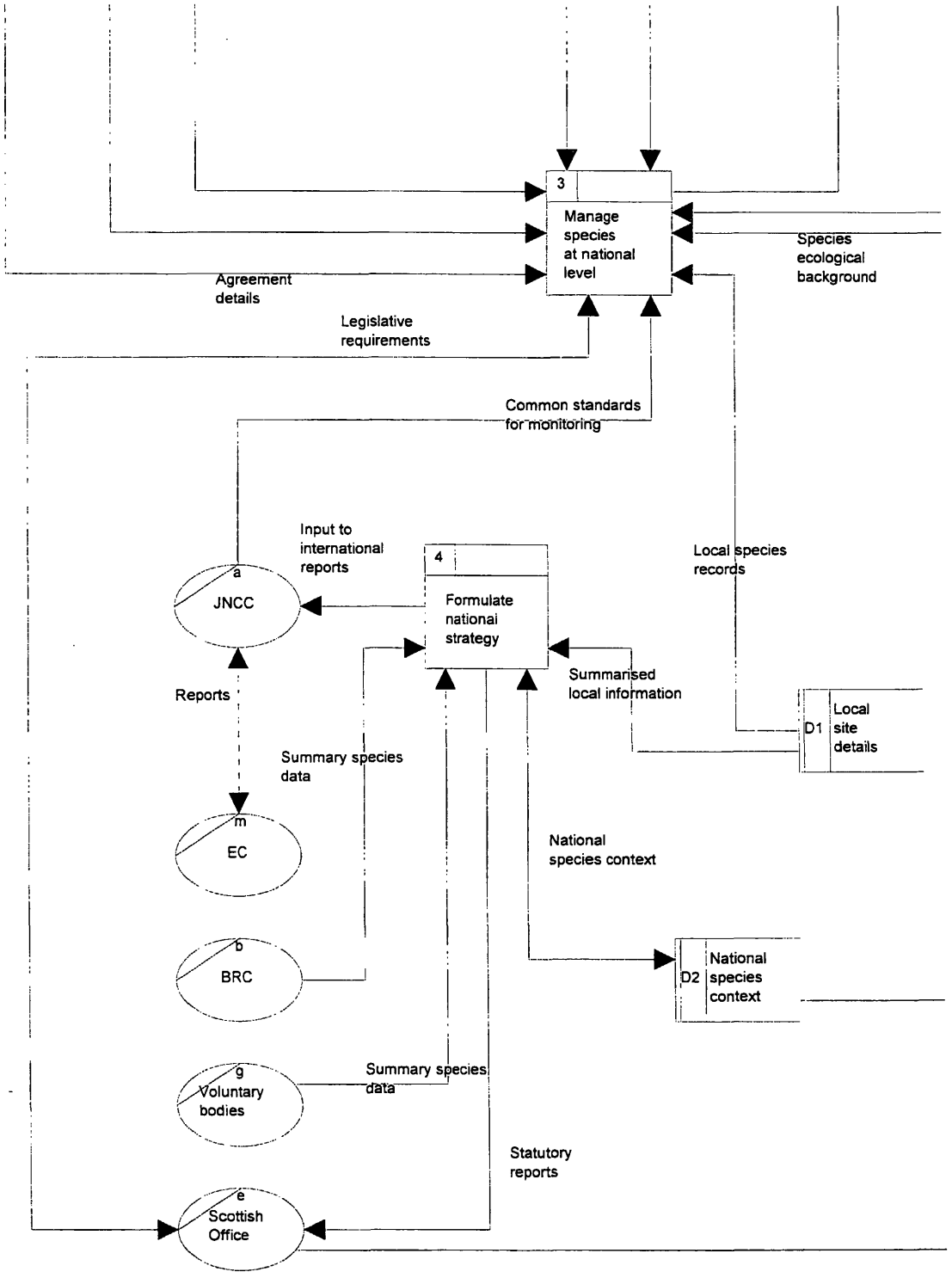
SPECIES DATA FLOW - CONTEXT DIAGRAM

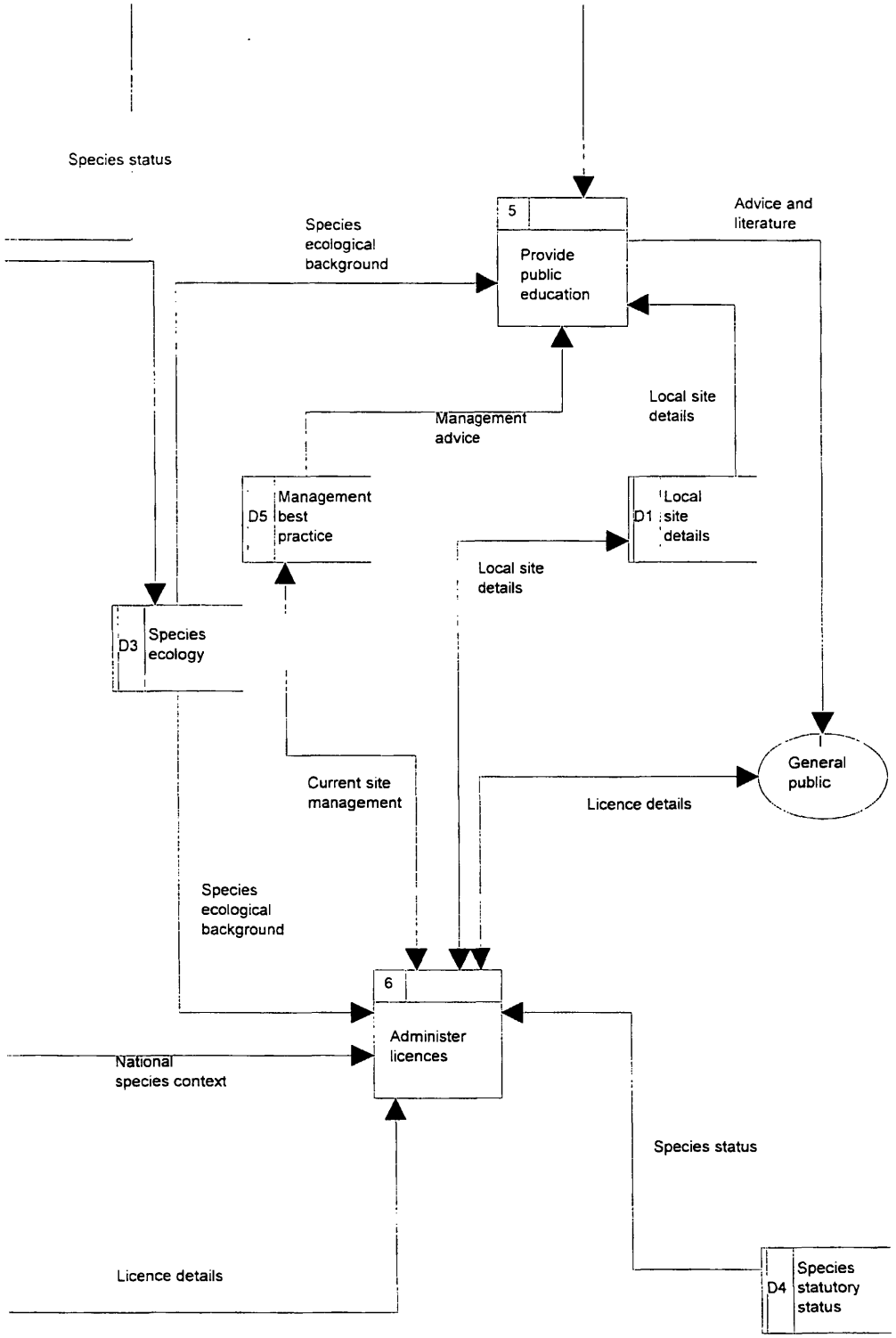


SPECIES DATA FLOW - DIAGRAM OF MAJOR FLOWS




e
Scottish Office
a
JNCC
m
EC
Sites
National/ international sites
Proposed sites
Proposed sites
l
Local Records Centres
Local site details
National species context
2
Select sites for designation
National species context
D2
National species context
D1
Local site details
Local site details
b
BRC
Notification of designation
k
Land managers
D3
Species ecology
Species ecological background
D4
Species statutory status
Species status
National species context
Local site details
g
Voluntary bodies
Information and advice


3
Manage species at national level
Agreement details
Legislative requirements
Species ecological background
Common standards for monitoring
Input to international reports
4
Formulate national strategy
Local species records
a
JNCC
Reports
Summarised local information
D1
Local site details
Summary species data
m
EC
National species context
b
BRC
D2
National species context
g
Voluntary bodies
Summary species data
Statutory reports
e
Scottish Office


Species status
5
Provide public education
Species ecological background
Advice and literature
Management advice
Local site details
D5 Management best practice
D1 Local site details
Local site details
D3 Species ecology
General public
Current site management
Licence details
Species ecological background
6
Administer licences
National species context
Species status
Licence details
D4 Species statutory status

APPENDIX D Summary of Information by Function

Type of information used

Function	Local species, non-SSSI (spatially referenced)	Background ecology	Status (statutory, RDB etc)	Context - local, regional, national, international	Best management practice	Species on site - qualifying	Species on site - general	Sites notified for given species	Species coverage of Scotland	Time-series population trends	"Favourable conservation status" (rare/declining spp.)	Sources of species data	Land cover associations with species	Regional monitoring data	Species involved in cases	Site Management Statements	Corporate targets for species
Local/Regional																	
- Consultations	✓	✓	✓	✓													
- Manage sites		✓	✓	✓	✓	✓											
- Select sites		✓	✓	✓		✓											
- Manage species		✓	✓	✓	✓			✓									
- Provide education	✓	✓			✓	✓	✓			✓							
- Advise on licences	✓	✓	✓	✓													
- Advise on schedules		✓	✓	✓				✓									
National																	
- Provide context		✓	✓						✓	✓	✓						
- Provide data access			✓							✓		✓	✓				
- National reporting			✓							✓				✓			
- Species Action Plans		✓	✓	✓	✓			✓	✓		✓						
- International input			✓	✓		✓	✓	✓	✓	✓	✓						
- Co-ordinate site mgmt			✓		✓	✓	✓								✓	✓	
- National site evaluation		✓				✓	✓										✓
- Public awareness	✓	✓			✓	✓	✓			✓							

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Scottish Natural Heritage

Scottish Natural Heritage is an independent body established by Parliament in 1992, responsible to the Secretary of State for Scotland.

Our task is to secure the conservation and enhancement of Scotland's unique and precious natural heritage - the wildlife, the habitats, the landscapes and the seascapes - which has evolved through the long partnership between people and nature.

We advise on policies and promote projects that aim to improve the natural heritage and support its sustainable use.

Our aim is to help people to enjoy Scotland's natural heritage responsibly, understand it more fully and use it wisely so that it can be sustained for future generations.