



# United Kingdom

## Taxonomic Needs Assessment

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## **Executive Summary**

The Programme of Work of the Global Taxonomy Initiative calls upon countries that are parties to the Convention on Biological Diversity to carry out taxonomic needs assessments.

A taxonomic needs assessment for the UK was carried out in 2004 by the Natural History Museum in its role of National Focal Point for the Global Taxonomy Initiative.

The process for the UK assessment was developed in consultation with the UK GTI Steering Group, which included representatives from;

- Department for Environment, Food and Rural Affairs (Defra)
- Centre for Ecology and Hydrology
- National Biodiversity Network
- Royal Botanic Garden Edinburgh
- Royal Botanic Gardens Kew
- Joint Nature Conservation Committee

The UK Needs Assessment focussed on the needs of the biodiversity conservation communities in the UK and its Overseas Territories for taxonomic information and services, or information that is reliant on the availability of taxonomic expertise.

### **Taxonomic needs identified**

In the UK the following types of information, listed in order of importance, were identified as important for biodiversity conservation but not sufficiently accessible;

1. Habitat requirements of animals/plants
2. Information on local species distributions
3. Information on regional species distributions
4. Geographic Information System (GIS) data
5. Information on name changes
6. Lists of invasive alien species
7. Specialised identification services (taxonomic)

In the Overseas Territories the following types of information, listed in order of importance, were identified as important for biodiversity conservation but not sufficiently accessible;

1. Habitat requirements of animals/plants
2. Distribution maps
3. GIS data
4. Identification keys

Analysis of the responses received from organisations concerned with biodiversity conservation in different parts of the UK are contained within the report

### **Other Key Messages**

As well as these specific information needs, the assessment has revealed the following three issues affecting biodiversity conservation in the UK;

- A lack of awareness of relevant international policy initiatives (e.g. Global Strategy for Plant Conservation, Convention on Biological Diversity) and of UK responses to these initiatives (UK Biodiversity Action Plan, UK Biodiversity

Partnership, country strategies) among grass roots conservationists, and the corresponding lack of engagement of these groups in these responses and related national initiatives.

- The need to maintain existing taxonomic expertise, support appropriate capacity-building, and foster the exchange of expertise between taxonomists and conservationists (e.g. training conservationists to be para-taxonomists)
- The need for taxonomists to work in partnership with conservationists and ecologists to deliver the key information types (e.g. species identification services)

## Next Steps

The results of the UK Needs Assessment suggest that further actions are needed by both the taxonomic and biodiversity conservation sectors to;

- Facilitate the generation and delivery of the taxonomic information needed for biodiversity conservation in forms appropriate for users;
- Develop ways to translate the interests of stakeholders—including conservationists, environmental managers, statutory agencies and commerce—into the research priorities of both taxonomic research institutions and funding bodies.
- Identify those urgent taxonomic information needs that correspond with a genuine gap in UK taxonomic expertise, as opposed to a failure in information management or dissemination.
- Foster best practice in the dissemination of taxonomic information, and passing on of taxonomic skills to stakeholders e.g. through online information services, field guides, courses, qualifications.

These needs may already be addressed to a greater or lesser extent by existing or proposed organisations and initiatives, including;

- The National Biodiversity Network (NBN) is making significant progress in enhancing access to species distribution and taxonomic information for UK biodiversity conservation.
- The Darwin Initiative, run by Defra, has supported a number of projects that have generated taxonomic information and expertise in the Overseas Territories.
- The UK Biodiversity Research Advisory Group (BRAG) has published a strategy for non-native species research, highlighting the need for audits of non-native species.
- The establishment of a coordinating body for systematics has been proposed by the House of Lords in their 2002 report, “What on Earth? The Threat to the Science Underpinning Conservation”. Appropriately constituted, such a body could make a significant contribution to improving linkages between taxonomic research and the users of taxonomic information in the context of biodiversity conservation.

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## **1 – Introduction**

### **i) Purpose**

The purpose of the UK Taxonomic Needs Assessment was to identify the taxonomic information required for biodiversity conservation in the UK, including the Overseas Territories and Crown Dependencies. The assessment focussed on the needs of UK organisations involved in the conservation of UK biodiversity. It is hoped that the results of the assessment will help to inform the priorities of taxonomic organisations in the UK, and of the wider biodiversity conservation community.

The UK Needs Assessment differed from needs assessments previously carried out in other countries in that it sought to identify the needs of biodiversity conservation organisations for taxonomic information, rather than the needs of taxonomic organisations for resources to address significant gaps in knowledge or capacity. Only when the user needs have been identified will the capacity of the UK taxonomic community to respond to these needs be assessed.

It is hoped that the methodology developed for the UK Needs Assessment will provide a useful model for other countries developing their own taxonomic needs assessments

### **ii) Scope**

The UK Needs Assessment does not cover the biodiversity conservation needs of countries outside the UK whose biological diversity is present in UK natural history collections or studied by UK-based taxonomists.

It is anticipated that these countries will carry out their own needs assessments, from which those UK institutions with relevant natural history collections will be able to identify the taxonomic needs that they can address through research or the exchange of information.

It is also hoped that the regional and global needs assessments called for by the Programme of Work of the GTI will identify further needs which UK institutions, with their unique natural history collections and expertise, will be able to address.

### **iii) Methodology**

The UK Needs Assessment was carried out from July 2004 until October 2004. Information was gathered through face-to-face interviews, phone interviews and questionnaires.

The stakeholders involved in the assessment were selected from those organisations involved in the four sub-national Biodiversity Partnerships in the UK (England, Northern Ireland, Scotland, Wales) and those organisations leading on biodiversity conservation under the five thematic areas of the Convention on Biological Diversity (CBD) (forest biodiversity, inland water biodiversity, marine biodiversity, dryland biodiversity, agricultural biodiversity). The selection of stakeholders on both a sub-national and thematic basis was intended to ensure that a complete picture of taxonomic needs was produced by the assessment.

There is a significant degree of overlap between the various stakeholder lists in terms of organisational representation, and, in some cases, individuals, reflecting the fact that these organisations and individuals are often responsible for several different biodiversity conservation topics. This was taken into account when arranging interviews and sending questionnaires out.

#### **iv) Stakeholder selection**

The stakeholders included in the needs assessment were divided into *Key Stakeholders* and *Secondary Stakeholders*.

It was hoped that *Key Stakeholders* would be visited or contacted directly by the National Focal Point and information gathered through interviews. This did not prove necessary as most key stakeholders returned a completed questionnaire, and this produced a better, more complete response due to more time being available to fill it in.

A large number of other *Secondary Stakeholders* were sent the same questionnaire with contextual information on the needs assessment process and purpose.

The questionnaire was based on the results of previous taxonomic needs assessments, including; "Needs Assessment in Taxonomy of Arthropod Pests of Plants in Countries of South East Asia", "Needs Assessment in Taxonomy and Biosystematics for Plant Pathogenic Organisms in Countries of South East Asia" and, "Addressing the Needs of the Users of Botanical Information, Proceedings of a National Workshop for Stakeholders and End-Users of Botanical Information and Herbaria" (see bibliography).

#### **v) Outputs**

The outputs from the assessment will primarily be used to inform biodiversity conservation and taxonomic activities in the UK. However, it is evident that a methodology for a taxonomic needs assessment could be of use for other countries contemplating such an assessment. The UK National Focal Point therefore anticipates presenting the results of and methodology for the needs assessment at the eighth meeting of the Conference of Parties (COP) to the CBD when GTI will be a major topic for discussion.

#### **vi) Questionnaire**

The needs assessment questionnaire was primarily concerned with identifying the taxonomic information and services which biodiversity conservation organisations in the UK are currently using and those which are needed but are not currently available. The reason for gathering this information was to enable the focal point to identify those information sources which are either currently available but unsustainable due to limited availability of expertise, and those which are unavailable but needed by stakeholders. This information should allow the UK taxonomic community to set internal priorities that reflect the needs of one of their primary user groups.

## **2 – Organisations that Responded**

### **i) Selection of organisations to be sent questionnaires**

Over 500 questionnaires were sent out to biodiversity conservation organisations all over the UK and in the Overseas Territories.

The list of organisations to which questionnaires were sent was compiled in the following way;

- 1) Contact points for specific thematic areas (e.g. inland water biodiversity, marine and coastal biodiversity, forest biodiversity) were identified within Defra, the Department for International Development (DFID) and other relevant national governmental bodies
- 2) These contact points were asked to suggest those organisations most actively involved in biodiversity conservation activities relative to the various thematic areas and where possible named individuals within these organisations
- 3) Members of the GTI Steering Group were asked to add to this list as appropriate.
- 4) The questionnaire was sent out to this list of people by email
- 5) Further contacts that were suggested by those to which the questionnaire had been sent were also sent questionnaires. These included;
  - a. Local Biodiversity Action Plan partnerships
  - b. Wildlife Trusts offices
  - c. Lead Partners for Habitat and Species Action Plans

### **ii) Number and type of organisations that responded**

Ninety-nine completed questionnaires had been received by or shortly after the deadline of September 17<sup>th</sup> 2004.

Of these questionnaires 11 were from organisations concerned with biodiversity conservation in the Overseas Territories, the remaining 88 being from organisations concerned with biodiversity conservation in England, Northern Ireland, Scotland, Wales, or in the UK as a whole.

As Table 2 (see Annex) shows, the types of organisations that responded were evenly divided between governmental and non-governmental organisations, this being the case for both UK and the Overseas Territories.

Table 2 also shows that only a handful of organisations that responded described themselves as “Research Institutions” and that only one museum responded, reflecting the intended purpose of the assessment; to identify the needs of conservation organisations for taxonomic information and services, not the needs of taxonomic organisations.

### **iii) Ecosystem types**

Table 3 in Annex 1 shows the ecosystems to which the conservation activities of respondents relate. Most respondents identified more than one ecosystem, and many were involved in work relevant to a large number of ecosystems.

Over half of all those who responded are involved in work on terrestrial ecosystems and/or in protected areas. More than a third described their work as relating to inland water, forest, marine and/or agricultural ecosystems. There is therefore a fairly even spread of responses across the various ecosystems found in and around the UK.

Less than a fifth described their work as relating to island ecosystems, even though, technically, all those consulted were working on island biodiversity. Of the twenty that worked on island ecosystems, nine were from overseas territories, four were from Scotland, two were from Northern Ireland and the remaining two came from Wales and England.

Of the seven organisations that were involved in work relevant to Dryland Ecosystems, three were UK organisations (RSPB, Buglife, ZSL), three were overseas territories organisations (RSPB, Anguilla National Trust, Island Resources Network), and one was from Scotland (RBG Edinburgh).

A number of "Other" responses were received that added "urban biodiversity", "heathland" and "upland biodiversity" to the list of ecosystems.

#### **iv) Species**

Table 4 in Annex 1 lists the types of species that the work of respondents was most concerned with. This table reflects the answers given in relation to ecosystem type and shows that the greatest numbers of organisations were interested in terrestrial species (460 responses in total relating to terrestrial species, with a maximum of 77 for terrestrial vascular plants), fewer numbers in freshwater biodiversity (227 responses in total, the greatest single number being 61 for freshwater invertebrates), and the least in marine biodiversity (201 responses in total with a top figure of 40 responses for marine birds).

The work of most respondents was concerned with more than one species type (e.g. terrestrial birds, mammals and invertebrates) and often with different types of species from different ecosystems (e.g. freshwater invertebrates and the terrestrial species that eat them).

Interestingly the responses received show that the work of these organisations bears no relation to actual species diversity on the ground. Over two thirds of respondents described their work as being concerned with birds, while only twelve were concerned with micro-organisms. This may reflect the interests of the public and policy-makers, but is perhaps also indicative of the state of our knowledge of the natural world in terms of both taxonomy and ecology.

The number of organisations whose work is concerned with invasive non-native species also seems disproportionate to the actual number of such species, but possibly reflects the damage they can cause, and the current levels of interest in this issue.

#### **v) Types of activities**

Table 5 in Annex 1 shows the different types of activities that respondent biodiversity conservation organisations are involved in. Most organisations are actively involved in a number of different activities.

Almost ninety percent of the organisations that responded indicated that they were involved in public education and awareness-raising activities. Of the ten responses that did not say that their organisations were involved in these activities, three were from organisations that had submitted multiple responses, some of which said that they were involved, and three were from organisations that by their very nature (museums, societies of amateur naturalists) are involved in such activities. Public education and awareness-raising are therefore part of the activities of the majority (95%) of the organisations that responded.

The responses received also show that only a quarter of these organisations are in any way involved in the taxonomic work that underpins their conservation activities. While more than

two thirds (66) are involved in environmental monitoring; only twenty-five are involved in work to develop reference collections, and twenty in work on indicator species taxonomy.

At the same time a relatively low proportion of the organisations that responded seem to be engaged with the initiatives that are driving the biodiversity conservation activities they are involved in. While seventy-seven organisations described themselves as being interested in terrestrial vascular plant species (see Table 4, Annex 1) only eleven of these (and only twelve in total) said that they were involved in the Global Strategy for Plant Conservation.

### *Overseas Territories*

If the responses from Overseas Territories organisations are considered separately, it is apparent that there are different priorities for these organisations as compared to those from the rest of the UK.

A greater proportion of Overseas Territories biodiversity conservation organisations are concerned with the following issues as compared to organisations in British Isles;

- CITES
- Developing reference collections
- Natural Resources Exploitation
- Ecotourism
- Controlling invasive alien species
- Species Reintroductions
- EIA
- Publishing educational materials

Although the total number of responses received from Overseas Territories organisations was small, the responses show that a different approach to biodiversity conservation has been taken in these countries. This needs assessment shows that they have different needs for taxonomic information as compared to organisations in the British Isles.

### **3 – Importance of Taxonomy**

#### **i) Importance of taxonomy in general to respondents**

Over two thirds of all the organisations that responded considered taxonomy “very important” to their work, and over ninety percent of all the organisations that responded considered taxonomy “Important” or “very important”, as shown by Table 6 in Annex 1.

##### *Overseas Territories*

In the Overseas Territories the proportions were slightly lower but still show a widespread belief that taxonomy is important for biodiversity conservation activities with over seventy percent of organisations describing taxonomy as “Important” or “Very Important”.

#### **ii) Importance of specific types of taxonomic information**

Table 7 in Annex 1 sets out only the number of “very important” responses linked to taxonomic information described as “not accessible” by respondents.

Information on, “the conservation status of species” was described as “very important” by the greatest number (78) of respondents. Information on, “habitat requirements of animals/plants” and “lists of protected animals/plants” were also described as “very important” by more than seventy-five percent of respondents. Information on, “local species distributions,” “field guides,” “lists of scientific names of animals/plants,” and “distribution maps”, were described as “very important” by more than two-thirds of respondents.

##### *Overseas Territories*

Organisations from the Overseas Territories also thought that information on the conservation status of species, lists of scientific names of animals/plants and field guides were important. These types of information were described as “very important” by more than seventy-five percent of respondents.

Information on the habitat requirements of animals/plants, lists of protected animals/plants, information on local species distributions, distribution maps and information on national species distributions were described as “very important” by more than two thirds of Overseas Territories, a similar proportion to the aggregated responses.

The responses of organisations from the Overseas Territories differed markedly from the overall response in relation to information on, “literature,” and on “lists of invasive species”. These types of information were considered “very important” by over two-thirds (7) of organisations from Overseas Territories, as compared to just over one third of the aggregated responses. Overseas Territories organisations also considered, “GIS data” and “lists of common names of animals/plants” more important than did other organisations.

#### **iii) Priority information needs**

Table 7 in Annex 1 is intended to help identify those types of taxonomic information that are both important for biodiversity conservation, but not accessible. For this reason all the “not accessible” responses were added together for each information type.

The following seven types of taxonomic information (in bold text in Table 7 of Annex 1 and listed in descending order of number of “very important” responses) were identified on the basis that they were identified as “very important” by more than a third (33) of respondents, and as “not accessible” by a fifth or more of respondents;

- **Habitat requirements of animals/plants**
- **Information on local species distributions**
- **Information on regional species distributions**
- **GIS data**
- **Information on name changes**
- **Lists of invasive alien species**
- **Specialised identification services (taxonomic)**

However this result is potentially misleading as a significant number of questionnaires were returned with responses that could not easily be analysed, such as “Y/N”, “Y but patchy” or “incomplete”. These responses have been largely ignored for the purposes of the UK-level analysis but will be considered for the sub-national analysis in Section 4. The example of information on plant/animal interactions below shows these types of responses can be significant:

Information on animal/plant interactions (shaded in grey in Table 7 of Annex 1), was only described as “very important” by twenty-eight organisations, but forty-one described this information as being “not accessible”. Interestingly, twenty-nine of the remaining seventy-one organisations described this information as “important”, and fifteen described the accessibility of this information with a qualified answer (Y/N or similar). This suggests that this type of information should be added to the list of those that are important but unavailable.

### *Overseas Territories*

If the responses from overseas territories are considered separately, a different set of types of taxonomic information is identified as important for biodiversity conservation. The following four types of taxonomic information (in bold text in Table 7 Annex 1) were described as “very important” by more than a third (four or more) respondents, and as “not accessible” by a fifth or more of respondents;

- **Habitat requirements of animals/plants**
- **Distribution maps**
- **GIS data**
- **Identification keys**

Lists of scientific names of animals/plants might also be added to this list, as nine of the eleven respondents thought this information was “very important” and although only two described it as “not accessible”, a further four gave “Y/N” answers.

### *UK not including Overseas Territories*

If the responses from organisations in the Overseas Territories are removed from the aggregated responses, there is a slight change in the relative ranking of the various types of information, but this is not significant enough to be useful for the purposes of this assessment.

## 4 – Sub-national Analysis

In order to gain maximum value from this assessment, the results have been analysed on a regional basis, decided on the basis of the area of activity of a particular organisation. Some of the organisations that responded are active in more than one but not all UK administrations (e.g. Environment Agency) and that some are active in the Overseas Territories as well as in England, Northern Ireland, Scotland and Wales (e.g. RSPB).

Where single responses have been submitted for different parts of such organisations, they have been associated with the administrative area where the particular part of the organisation responding carries out its activities.

### i) England

Thirty completed questionnaires were submitted by English biodiversity conservation organisations (see Annex 1, Table 1). For the purposes of this assessment the Environment Agency was considered as an English organisation, although its authority includes Wales.

A greater proportion of those organisations working on English biodiversity as compared to the aggregated responses thought that the following types of information were “very important”;

- Information on local species distributions
- GIS Data

This suggests that a greater emphasis is placed by these organisations on distributional data. Interestingly a higher proportion of English biodiversity conservation organisations described the following information, listed in order of importance, as “not accessible” as compared to the aggregated responses, while giving similar or greater scores in terms of the information’s importance for biodiversity conservation;

- Information on local species distributions
- GIS data
- Distribution maps
- Information on regional species distributions
- Information on national species distributions
- Lists of invasive alien species

It seems that a lack of distributional data is a greater problem for English organisations than for elsewhere in the UK, although it may also be the case that other regions are less aware of the limited availability of this information.

### ii) Northern Ireland

Seven completed questionnaires were sent in by biodiversity conservation organisations from Northern Ireland (see Annex 1, Table 1).

In Northern Ireland a greater proportion of respondents than in Great Britain as a whole thought that the following types of information were “very important”;

- Field guides
- Images/photographs of animals/plants
- Identification keys

- Information on national species distributions
- Information on animal/plant interactions
- Lists of invasive alien species

A significantly lower proportion of Northern Irish organisations as compared to the aggregated responses thought that the following type of information was “very important”;

- GIS Data

The responses received suggest a higher demand in Northern Ireland as compared to elsewhere for taxonomic information that can be used in the field in conjunction with other locatable geographic data, as compared to more technical information tools combining both taxonomic and geographic information.

### **iii) Scotland**

Sixteen completed questionnaires were sent in by biodiversity conservation organisations from Scotland (see Annex 1, Table 1).

The responses from Scottish biodiversity conservation organisations did not differ significantly from the responses for the UK as a whole. A slightly greater proportion of Scottish organisations thought that GIS information was important, and a lower proportion thought that field guides were important compared to Great Britain as a whole

### **iv) Wales**

Sixteen completed questionnaires were sent in by biodiversity conservation organisations from Wales (see Annex 1, Table 1).

In Wales a greater proportion of respondents as compared to the UK as a whole thought that the following types of information were “very important”;

- Lists of invasive alien species
- Plant/animal descriptions
- Information on animal/plant interactions

A higher proportion also thought that the following types of information were “not accessible”;

- Information on regional species distribution
- Information on name changes

A lower proportion of Welsh organisations as compared to the aggregated responses thought that the following types of information were “very important”;

- Lists of scientific names of animals/plants

## 5 – Next Steps

The results of the UK needs assessment suggest that further action is needed by both the taxonomic and biodiversity conservation sectors to:

- Facilitate the generation and delivery of the taxonomic information needed for biodiversity conservation in forms appropriate for users;
- Develop ways to translate the interests of stakeholders, including conservationists, environmental managers, statutory agencies and commerce, into the research priorities of both taxonomic research institutions and funding bodies;
- Identify those urgent taxonomic information needs that correspond with a genuine gap in UK taxonomic expertise, as opposed to a failure in information management or dissemination;
- Foster best practice in the dissemination of taxonomic information, and passing on of taxonomic skills to stakeholders e.g. through online information services, field guides, courses, qualifications.

A number of existing organisations and initiatives are currently delivering services or information tools relevant to these needs, and other planned initiatives could also potentially help. Listed below are examples of ongoing or planned activities that are relevant to the GTI programme of work and to the findings of the needs assessment. The assessment will help to target these activities on those gaps in information or expertise considered most serious by biodiversity conservation organisations:

### **i) National Biodiversity Network (NBN)**

The National Biodiversity Network (NBN) has been established to share UK biodiversity data via its website, the NBN Gateway. Among other things, access to data is intended to assist both policy-makers and conservationists in taking decisions relating to biodiversity and sustainable development.

#### *NBN Gateway*

The NBN Gateway provides access to data on the geographical distribution of UK species of plants and animals. Much of this data has been gathered from the biological records held by voluntary recording groups in the UK, some of which have been in existence for over a hundred years.

The NBN also acts as the UK's national node for the Global Biodiversity Information Facility (GBIF). As such, the NBN currently provides over 12.5 million data records to GBIF. The NBN Gateway will address the priority data needs for species distribution data at the national and local levels identified by the needs assessment.

#### *NBN Species Dictionary*

The NBN Species Dictionary is a list of the common and scientific names and synonyms of UK species of flora and fauna. The list is regularly updated and serves both those searching the NBN Gateway for data, and those gathering data for adding to records on the NBN Gateway. The Species Dictionary is managed on behalf of the NBN Trust by the Natural History Museum. Work is ongoing to improve both its content and functionality.

The Species Dictionary is also used by other UK conservation organisations such as the Environment Agency for their own monitoring purposes. Once complete, the Species Dictionary will help address the priority information needs for up to date species names identified by the needs assessment.

## **ii) UK Biodiversity Partnership**

The UK Biodiversity Partnership brings together all the partners involved in or with an interest in the UK Biodiversity Action Plan and in policy on biodiversity. It has a Standing Committee drawn from the country administrations and NGOs which co-ordinates action that should be taken forward at a UK level.

The UK Biodiversity Partnership comprises a wide range of people, from those who provide funds, amateur and professional experts, to those who are interested in the rich wildlife and natural history of the UK. They are private individuals, business, government and non-governmental representatives, and many are represented on several formal bodies.

The full partnership has met annually in summer since 2003.

## **iii) Biodiversity Research Advisory Group (BRAG)**

The overall purpose of the Biodiversity Research Advisory Group (BRAG) is to provide advice to the community of biodiversity research funding bodies, research users and research institutions about biodiversity research priorities and co-ordination in the UK.

UK BRAG aims to promote and facilitate research that seeks to support implementation of the Convention on Biological Diversity (CBD), and to enable effective and efficient UK engagement with European and international biodiversity research initiatives.

The membership of UK BRAG represents the UK biodiversity research and practitioner community including members from statutory conservation agencies, academia, the collections, the National Environmental Research Council (NERC) and government departments.

## **iv) Non-Native Species Projects and Coordinating Mechanism**

In March 2005 the Minister for Nature Conservation and Fisheries, Ben Bradshaw, announced plans to establish a Programme Board to co-ordinate and ensure the consistency of application of non-native species policy across Government.

The planned Board would develop a strategy for addressing key issues concerning non-native species policy, including public awareness and stakeholder engagement activities. The Board would constitute a coordinating mechanism for actions to implement the strategy on invasive species policy carried out by its members, and could help address the need for an up to date list of invasive species identified by the needs assessment.

A strategy for non-native species research has been published by the Biodiversity Research Advisory Group (BRAG), and highlights the need for audits of existing capacity and activities for dealing with non-native species. These audits would build on the results of a recently concluded Defra-funded project to assess the risks posed by non-native organisms to species, habitats or ecosystems in the UK.

## **v) Training and Accreditation in Species Identification**

In 2004 the UK GTI National Focal Point, in collaboration with the School of Biosciences of Birmingham University and the Field Studies Council (FSC) piloted a number of advanced level species identification courses. The Identification Masterclasses are linked to the identification Qualifications or IdQs, an existing accreditation scheme that has been run by the National Focal Point. These courses are intended to help build basic taxonomic capacity among those government agencies and private sector organisations that need advanced, species level ID skills to be able to comply with increasingly strict environmental legislation.

The GTI National Focal Point has also assisted with the development of a biology A-level incorporating taxonomy and systematics. The new Salters-Nuffield Advanced Biology incorporates a requirement for students to complete a report on a 'Biological Visit or Issue'. In January 2005 the Natural History Museum hosted a visit in support of this course.

#### **vi) Coordinating Body for Systematics**

The House of Lords Select committee on Science and Technology, in its 2002 report, "What on Earth? The Threat to the Science Underpinning Conservation", proposed the establishment of a coordinating body for systematics. Appropriately constituted, such a body could make a significant contribution to Improving linkages between taxonomic research and the users of taxonomic information in the context of biodiversity conservation. Lessons learned in the creation and dissolution of a previous such body, the UK Systematics Forum, that made some progress in this area, must be taken into account.

#### **vii) Darwin Initiative**

The Darwin Initiative is a small grants programme that aims to promote biodiversity conservation and sustainable use of resources around the world. The Initiative is funded and administered by Defra. The Darwin Initiative has supported a number of projects that have generated taxonomic information and expertise in the Overseas Territories, including:

- Cultivation and Conservation of Threatened Plant Species for UK Overseas Territories
- Status and Distribution of the Flora of The Falkland Islands
- Falkland Islands Invertebrate Project
- Empowering the people of Tristan da Cunha to implement the CBD, and
- Capacity building for biodiversity conservation in Anguilla.

#### **viii) Environmental Research Funders' Forum (ERFF)**

The Environment Research Funders' Forum (ERFF) is a focus group bringing together the UK's major public sector sponsors of environmental science.

Established in 2002, its current chair is Professor Howard Dalton, Chief Scientific Advisor to Defra.

ERFF brings together the main UK public bodies that fund or use environmental research and trained scientists. The goal of the Forum is to maximise the coherence and effectiveness of UK environmental sciences funding.

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## Acronyms and Abbreviations

BRAG	Biodiversity Research Advisory Group
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered species
COP	Conference of Parties
Defra	Department for Environment food and Rural Affairs
DFID	Department for International Development
EIA	Environmental Impact Assessment
ERFF	Environmental Research Funders' Forum
FSC	Field Studies Council
GBIF	Global Biodiversity Information Facility
GIS	Geographic Information System
GTI	Global Taxonomy Initiative
NBN	National Biodiversity Network
NERC	National Environmental Research Council
NHM	Natural History Museum
RBG Edinburgh	Royal Botanic Garden, Edinburgh
RBG Kew	Royal Botanic Gardens, Kew
RSPB	Royal Society for the Protection of Birds
UK	United Kingdom
ZSL	Zoological Society of London

## United Kingdom Overseas Territories and Crown Dependencies

### Overseas Territories

The Overseas Territories are constitutionally not part of the United Kingdom. They have separate constitutions, and most Overseas Territories have elected governments with varying degrees of responsibilities for domestic matters. The Governor, who is appointed by, and represents, HM the Queen, retains responsibility for external affairs, internal security, defence, and in most cases the public service.

There are 14 UK Overseas Territories;

- Anguilla,
- Bermuda,
- British Antarctic Territory (BAT),
- British Indian Ocean Territory (BIOT),
- British Virgin Islands (BVI),
- Cayman Islands,
- Falkland Islands,
- Gibraltar,
- Montserrat,
- Pitcairn Islands,
- St Helena and its Dependencies (Ascension Island and Tristan da Cunha),
- South Georgia and the South Sandwich Islands,
- the Sovereign Base Areas of Akrotiri and Dhekelia in Cyprus and
- The Turks & Caicos Islands (TCI)

### Crown Dependencies

The "Crown Dependencies" are internally self-governing "Dependencies" of the Crown included in the term "British Islands". They are "British Possessions" but not "colonies" To distinguish them from the United Kingdom Overseas Territories, they are referred to as "Crown Dependencies".

*The Islands are not part of the United Kingdom* and have no representation in Parliament at Westminster. The "Crown Dependencies" comprise:

- the Bailiwick of Guernsey (including Alderney, Sark and Herm)
- the Isle of Man
- the Bailiwick of Jersey

For the purposes of this assessment the responses received from Crown Dependencies and Overseas Territories have been grouped together.

## ANNEX 1 – Tables

**Table 1 - Lists of institutions**

*United Kingdom*

<b>Organisation</b>
Allan Lock
Biological Records Centre, Monks Wood
Botanical Society of the British Isles
British Dragonfly Society
British Lichen Society
Buglife
Butterfly Conservation
Defra Marine & Waterways Division
Farming & Wildlife Advisory Group (FWAG)
Forestry Commission, Alice Holt
Herpetological Conservation Trust
Institute of Grassland and Environmental Research
Joint Nature Conservation Committee (Marine)
National Forest Company
Pond Conservation
Royal Horticultural Society
Royal Society for the Protection of Birds
Zoological Society of London

**England**

<b>Organisation</b>
Beds & Luton Biodiversity Recording and Monitoring Centre
Berkshire Buckinghamshire and Oxfordshire Wildlife Trust
Cambridgeshire County Council
Dorset Wildlife Trust
Eden Project
English Nature (Ecologists)
English Nature (Forest lead partner)
English Nature (Fungi)
English Nature (Invertebrates)
Environment Agency
Environment Agency
Environment Agency (Chalk Rivers Lead Partner)
Environment Agency (Pea Mussel Lead Partner)
Essex Biodiversity Project
Forest Enterprise England
Herefordshire Biodiversity Partnership
Hertfordshire and Middlesex Wildlife Trust
Hull Biodiversity Partnership
Kent Wildlife Trust
Leicester County Council, Heritage Services
London Wildlife Trust
North and East Yorkshire Ecological Data Centre
Oxfordshire Nature Conservation Forum
Peak District National Park Authority
rECOrd - Chester Zoological Gardens
Shropshire County Council
Shropshire Wildlife Trust
Staffordshire Wildlife Trust
Surrey Wildlife Trust
Tees Valley Wildlife Trust

### *Northern Ireland*

<b>Organisation</b>
Allen and Mellon
Antrim Borough Council
Butterfly Conservation (Northern Ireland)
Department for Agriculture and Rural Development
Environment and Heritage Service
Farming and Wildlife Advisory Group
Newtownabbey Borough Council

### *Scotland*

<b>Organisation</b>
Dumfries & Galloway Biodiversity Partnership
Fife Environmental Recording Network
Forestry Commission
National Trust for Scotland
National Trust for Scotland South West Office
North Lanarkshire Council
Royal Botanic Gardens Edinburgh (Species Action Plan Lead Partner)
Scottish Environmental Protection Agency Marine/Freshwater
Scottish Executive
Scottish Natural Heritage (Inland waters)
Scottish Natural Heritage (Marine)
Scottish Natural Heritage, Lerwick
Scottish Wildlife Trust, North
Sea-fari Adventures (Oban)
Shetland Amenity Trust
Trelareg Consultants/Journal of Agricultural Science

## ***Wales***

<b>Organisation</b>
Brecknock Wildlife Trust
Brecon Beacons National Park Authority
Bridgend County Borough Council
Countryside Council for Wales
Countryside Council for Wales (Marine – A. Cooke)
Countryside Council for Wales (Marine)
Farmers Union of Wales
Gwent County Borough Council Advisor/Amateur Naturalist
Moelyci Environmental Centre
North Wales Wildlife Trust
North-West Wales Moth Project
Snowdonia National Park Authority
Snowdonia National Park Authority
Torfaen County Borough Council
Transport Directorate, Welsh Assembly Government
Welsh Assembly

## ***Overseas Territories***

<b>Organisation</b>
Anguilla National Trust
Ascension Island Government
Bermuda Natural History Museum
Environment Department Jersey
Falklands Environmental Planning Department
Gibraltar Natural History Society
Global Islands Network
Island Resources Foundation
Pitcairn Island Government
Royal Society for the Protection of Birds
St Helena Government

**Table 2 – Organisation Types**

*United Kingdom including Overseas Territories*

Organisation Type	Number of responses
National Non-Governmental Organisations	25
Statutory Agencies	20
Government Departments	18
Regional Non-Governmental Organisations	14
Research Institutions	8
Private Companies	6
Amateur Societies	4
University or Other Educational Body	3
Other	
Charity	6
Local Government	4
LBAP Partnership	4
National Park Authority	3
Museum Service	1
A Non-departmental Public Body	1
Overseas Territory Government	1
Welsh Unitary Authority	1
Independent Project	1
Industrial and Provident Society	1

*Overseas Territories only*

Organisation Type	Number of responses
Government Departments	5
National Non-Governmental Organisations	3
Regional Non-Governmental Organisations	2
Statutory Agencies	1
Research Institutions	1

**Table 3 – Ecosystem**

*Ecosystem to which most conservation activities of respondents relate;*

Ecosystem	No of responses
Terrestrial	62
Protected Areas	49
Inland Water	43
Forest	38
Marine	38
Agricultural	37
Island	20
Dryland	7
Other	
Urban	3
Heathland	2
Uplands	1
Brownfield Sites	1
Lowland Raised Peat Bog	1
Inland Salt Water Ponds (Overseas Territory)	1

**Table 4 – Species**

*Species groups in which organisations are interested*

<b>Terrestrial Species</b>	
Plants (Vascular)	77
Invertebrates	73
Birds	70
Mammals	64
Invasive Non-native Species	61
Reptiles and Amphibians	60
Plants (Cryptogamic)	43
Micro-organisms	12
<b>Marine Species</b>	
Birds	40
Mammals	38
Fish	30
Invertebrates	30
Plants	28
Invasive Non-native Species	25
Micro-organisms	10
<b>Freshwater</b>	
Invertebrates	61
Plants	57
Invasive Non-native Species	49
Fish	46
Micro-organisms	14

**Table 5 – Biodiversity Conservation Activities**

*United Kingdom including Overseas Territories*

<b>Activity</b>	<b>Number of Organisations involved</b>
Public Education and Awareness Raising	88
Habitat Restoration	71
Compiling Biodiversity Inventories	69
Environmental Monitoring	66
Managing Protected Areas	64
Legislation and Species Protection	63
The Sustainable Use of Biodiversity	62
Publishing Educational Materials	60
Analysing Species Distribution	57
Selecting/Designating Protected Areas	56
Controlling Invasive Non-native Species	54
Developing Ecological Indicators	47
Environmental Research	47
Basic taxonomic training	47
Environmental Impact Assessment	44
Species Reintroductions	39
Producing identification aids/tools	35
Natural Resources Exploitation	33
Ecotourism	31
Professional/Accredited Training	31
Environmental Consulting	30
Support for Traditional Knowledge	28
Developing Reference Collections	25
Climate Change Monitoring	25

Developing Incentive Measures	25
Developing Rapid Assessment Techniques	23
Indicator Species Taxonomy	20
Global Strategy for Plant Conservation	12
CITES	11
Disease Control	9
Molecular Assessment Methods	7
Assessment of Phylogenetic Diversity	7
Identifying Wild Relatives	4

***Overseas Territories Only***

<b>Activity</b>	<b>Number of Organisations involved in this activity</b>
Public Education and Awareness Raising	9
Habitat Restoration	7
Compiling Biodiversity Inventories	8
Environmental Monitoring	5
Managing Protected Areas	6
Legislation and Species Protection	7
The Sustainable Use of Biodiversity	6
Publishing Educational Materials	8
Analysing Species Distribution	3
Selecting/Designating Protected Areas	7
Controlling Invasive Alien Species	9
Developing Ecological Indicators	4
Environmental Research	5
Basic Taxonomic Training	1
Environmental Impact Assessment	7
Species Reintroductions	6
Producing Identification Aids/Tools	4
Natural Resources Exploitation	5
Ecotourism	9
Professional/Accredited Training	2
Environmental Consulting	3
Support For Traditional Knowledge	3
Developing Reference Collections	6
Climate Change Monitoring	1
Developing Incentive Measures	1

Developing Rapid Assessment Techniques	2
Indicator Species Taxonomy	0
Global Strategy for Plant Conservation	0
CITES	4
Disease Control	0
Molecular Assessment Methods	1
Assessment of Phylogenetic Diversity	1
Identifying Wild Relatives	0

**Table 6 – Importance of Taxonomy**

*Importance of Taxonomy (UK)*

<b>How important is taxonomic information in general for the work of your organisation?</b>	
Very important	66
Important	23
Not important	2
Not used	1
No response	6

*Importance of Taxonomy (Overseas Territories only)*

<b>How important is taxonomic information in general for the work of your organisation?</b>	
Very important	7
Important	1
Not important	0
Not used	0
No response	3

**Table 7 – Use of Taxonomic Information**

*United Kingdom Including Overseas Territories*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Information on the conservation status of species	78	7
<b>Habitat requirements of animals/plants</b>	<b>75</b>	<b>20 (18 y/n)</b>
Lists of protected animals/plants	74	6
<b>Information on local species distributions</b>	<b>72</b>	<b>22</b>
Field guides	70	7
Lists of scientific names of animals/plants	67	5
Distribution maps	67	16
Information on national species distributions	64	16
Identification keys	62	16
<b>Information on regional species distributions</b>	<b>61</b>	<b>22</b>
Lists of common names of animals/plants	55	9
Name lists in databases	48	10
Images/photographs of animals/plants	46	17
Public education materials	43	10
<b>GIS data</b>	<b>40</b>	<b>29</b>
<b>Information on name changes</b>	<b>38</b>	<b>39</b>
<b>Lists of invasive alien species</b>	<b>38</b>	<b>21</b>
Training courses/materials	35	14
<b>Specialised identification services (taxonomic)</b>	<b>35</b>	<b>20</b>
Plant/animal descriptions	34	10
Information on literature	35	18
Information on animal/plant interactions	28	41
Phenological information	21	24
Access to specimens of animals/plants	16	27

*Overseas Territories Only*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Information on the conservation status of species	9	1
Lists of scientific names of animals/plants	9	2 (4 y/n)
Field guides	8	1
<b>Habitat requirements of animals/plants</b>	<b>7</b>	<b>3</b>
Lists of protected animals/plants	7	
Information on local species distributions	7	2 (3 y/n)
<b>Distribution maps</b>	<b>7</b>	<b>4</b>
Information on national species distributions	7	2 (3 y/n)
Lists of common names of animals/plants	7	2 (3 y/n)
<b>GIS data</b>	<b>7</b>	<b>4</b>
Information on literature	7	1
<b>Identification keys</b>	<b>6</b>	<b>3</b>
Name lists in databases	6	2
Lists of invasive alien species	6	2
Information on regional species distributions	5 (3 important)	1 (3 y/n)
Images/photographs of animals/plants	5	2
Public education materials	5	1
Information on name changes	3	4
Specialised identification services (taxonomic)	3	4
Training courses/materials	2	3
Plant/animal descriptions	2 (4 important)	1 (3 y/n)
Information on animal/plant interactions	2 (3 important)	5
Phenological information	2	3
Access to specimens of animals/plants	1	3

***UK responses (not including Overseas Territories)***

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Information on the conservation status of species	69	6
<b>Habitat requirements of animals/plants</b>	<b>68</b>	<b>17</b>
Lists of protected animals/plants	67	6
<b>Information on local species distributions</b>	<b>65</b>	<b>20</b>
Field Guides	62	6
Lists of scientific names of animals/plants	58	3
Distribution maps	60	12
Information on national species distributions	57	14
Identification keys	56	13
<b>Information on regional species distributions</b>	<b>56</b>	<b>21</b>
Lists of common names of animals/plants	48	7
Name lists in databases	42	8
Images/Photographs of animals/plants	41	15
Public education materials	38	9
<b>GIS data</b>	<b>33</b>	<b>25</b>
<b>Information on name changes</b>	<b>35</b>	<b>35</b>
<b>Lists of invasive alien species</b>	<b>32</b>	<b>19</b>
Training courses/materials	33	11
<b>Specialised Identification services (taxonomic)</b>	<b>32</b>	<b>16</b>
Plant/Animal Descriptions	32	9
Information on literature	28	19
Information on Animal/Plant interactions	26	36
Phenological information	19	21
Access to specimens of animals/plants	15	24

**Table 8 – Use of Taxonomic Information**

**Sub-national Analysis**

*UK (not including Overseas Territories or regional/local conservation organisations)*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Habitat requirements of animals/plants	14	4 (2 y/n)
<b>Lists of scientific names of animals/plants</b>	<b>14</b>	<b>1</b>
Lists of protected animals/plants	13	1
<b>Information on the conservation status of species</b>	<b>12</b>	<b>4 (2 y/n)</b>
Distribution maps	12	1 (5 y/n)
Information on national species distributions	12	1 (2 y/n)
<b>Information on regional species distributions</b>	<b>11</b>	<b>2 (4 y/n)</b>
Identification keys	11	3
Field guides	10	2
Images/photographs of animals/plants	10	2
Information on local species distributions	9	2 (5 y/n)
<b>Information on name changes</b>	<b>9</b>	<b>5</b>
<b>Information on literature</b>	<b>9</b>	<b>2 (1 y/n)</b>
Name lists in databases	9	1
<b>Specialised identification services (taxonomic)</b>	<b>8</b>	<b>1</b>
<b>Lists of common names of animals/plants</b>	<b>7</b>	<b>4</b>
<b>Training courses/materials</b>	<b>7</b>	<b>1 (2 y/n)</b>
Plant/animal descriptions	7	1
GIS data	6	4 (3 y/n)
Access to specimens of animals/plants	5	5
Phenological information	4	4
Public education materials	4	1 (3 y/n)
Information on animal/plant interactions	3	7 (3 y/n)
Lists of invasive alien species	3	2

*England*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
<b>Information on local species distributions</b>	<b>26</b>	<b>8 (5 y/n)</b>
Information on the conservation status of species	24	1
Field Guides	23	2
Habitat requirements of animals/plants	22	8 (8 y/n)
Lists of protected animals/plants	21	2
<b>GIS data</b>	<b>21</b>	<b>13 (5 y/n)</b>
<b>Distribution maps</b>	<b>21</b>	<b>7 (3 y/n)</b>
Lists of scientific names of animals/plants	20	1
<b>Information on regional species distributions</b>	<b>20</b>	<b>11 (5 y/n)</b>
Public education materials	20	4 (3 y/n)
Identification keys	19	5
Lists of common names of animals/plants	17 (9 important)	0
<b>Information on national species distributions</b>	<b>17</b>	<b>7 (4 y/n)</b>
Name lists in databases	15	3
Information on name changes	12	15
Training courses/materials	12	5 (6 y/n)
Images/photographs of animals/plants	11	7
Information on literature	11	8 (4 y/n)
Plant/animal descriptions	10	7
<b>Lists of invasive alien species</b>	<b>10</b>	<b>10</b>
Specialised identification services (taxonomic)	10	8 (3 y/n)
Information on animal/plant interactions	10	16 (5 y/n)
Phenological information	6	11 (3 y/n)
Access to specimens of animals/plants	4	15

*Northern Ireland*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
<b>Field guides</b>	<b>7</b>	<b>1</b>
<b>Images/photographs of animals/plants</b>	<b>7</b>	<b>2</b>
Habitat requirements of animals/plants	6	1 (1 y/n)
Lists of protected animals/plants	6	0
<b>Identification keys</b>	<b>6</b>	<b>2</b>
Information on regional species distributions	6	1 (1 y/n)
<b>Information on national species distributions</b>	<b>6</b>	<b>2</b>
Information on the conservation status of species	5 (2 important)	
Information on local species distributions	5	2 (1 y/n)
Distribution maps	5	2
Lists of common names of animals/plants	5	1
<b>Information on animal/plant interactions</b>	<b>4 (3 important)</b>	<b>5</b>
Lists of scientific names of animals/plants	4	1
Name lists in databases	4	1
<b>Lists of invasive alien species</b>	<b>4</b>	<b>2</b>
Public education materials	3	1 (1 y/n)
Training courses/materials	3	2
Information on name changes	2 (4 important)	2
Plant/animal descriptions	2 (4 important)	1 (1 y/n)
Information on literature	2	2
Specialised identification services (taxonomic)	2	4
Phenological information	2	2
Access to specimens of animals/plants	2	1
<b>GIS data</b>	<b>1 (4 important)</b>	<b>2</b>

*Scotland*

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Information on the conservation status of species	13	1 (4 y/n)
Lists of protected animals/plants	12 (2 important)	
Information on local species distributions	11 (4 important)	3 (6 y/n)
Habitat requirements of animals/plants	11 (3 important)	2 (5 y/n)
Lists of scientific names of animals/plants	10 (5 important)	(1 y/n)
Distribution maps	10 (3 important)	1 (5 y/n)
Information on national species distributions	10 (4 y/n)	1 (6 y/n)
<b>Field guides</b>	<b>9 (5 important)</b>	<b>(2 y/n)</b>
Identification keys	9 (5 important)	2 (1 y/n)
Lists of common names of animals/plants	9 (5 important)	(3 y/n)
Information on regional species distributions	9 (3 important)	1 (5 y/n)
<b>GIS data</b>	<b>9 (3 important)</b>	<b>2 (4 y/n)</b>
Name lists in databases	8 (4 important)	1 (1 y/n)
Images/photographs of animals/plants	6 (5 important)	1 (3 y/n)
Specialised identification services (taxonomic)	6	(3 y/n)
Public education materials	4 (8 important)	1 (3 y/n)
Information on name changes	7 (3 important)	4 (1 y/n)
Lists of invasive alien species	6 (5 important)	4
Training courses/materials	5 ( 4 important)	1 (3 y/n)
Plant/animal descriptions	5 (4 important)	(1 y/n)
Information on literature	3 (5 important)	3 (2 y/n)
Information on animal/plant interactions	2 (7 important)	4 (4 y/n)
Phenological information	2 (5 important)	2 (3 y/n)
Access to specimens of animals/plants	2 (3 important)	(1 y/n)

**Wales**

<b>Taxonomic Information</b>	<b>No. of “very important” responses</b>	<b>No. of “not accessible” responses</b>
Habitat requirements of animals/plants	15	2 (1 y/n)
Information on the conservation status of species	15 (1 important)	(3 y/n)
Lists of protected animals/plants	15 (1 important)	2 (1 y/n)
Information on local species distributions	14 (2 important)	5 (2 y/n)
Field guides	13	1 (1 y/n)
Distribution maps	12 (3 important)	1 (3 y/n)
Information on national species distributions	12 (3 important)	3
Identification keys	11 (3 important)	1 (1 y/n)
<b>Information on regional species distributions</b>	<b>10 (4 important)</b>	<b>6 (1 y/n)</b>
Lists of common names of animals/plants	10 (4 important)	2(3 y/n)
<b>Lists of scientific names of animals/plants</b>	<b>9 (5 important)</b>	<b>0</b>
<b>Lists of invasive alien species</b>	<b>9 (4 important)</b>	<b>3 (1 y/n)</b>
<b>Plant/animal descriptions</b>	<b>8 (3 important)</b>	<b>0</b>
<b>Information on animal/plant interactions</b>	<b>7 (5 important)</b>	<b>4 (2 y/n)</b>
Images/photographs of animals/plants	7 (3 important)	3 (2 y/n)
Public education materials	7 (5 important)	2 (1 y/n)
GIS data	6 (4 important)	4 (1 y/n)
<b>Information on name changes</b>	<b>6 (5 important)</b>	<b>8 (1 y/n)</b>
Training courses/materials	6 (8 important)	2 (1 y/n)
Specialised identification services (taxonomic)	6 (3 important)	3 (3 y/n)
Name lists in databases	6 (3 important)	1
Phenological information	5 (3 important)	2 (4 y/n)
Information on literature	3 (5 important)	3
Access to specimens of animals/plants	2 (2 important)	3 (1 y/n)