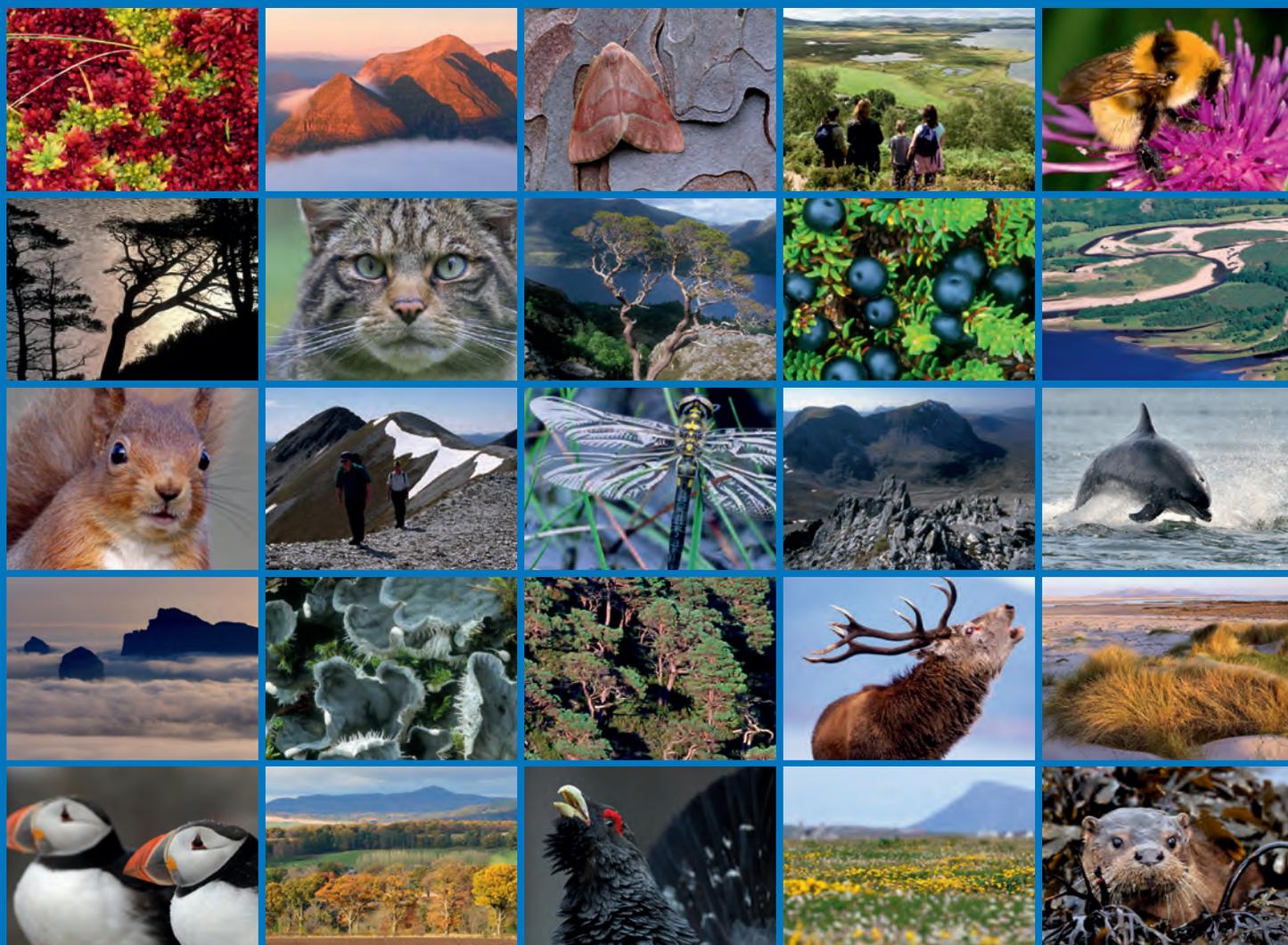# Involving people in biological recording

COMMISSIONED REPORT

Commissioned Report No. 382

Involving people in Biological Recording

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COMMISSIONED REPORT
Summary

Involving People in Biological Recording

Commissioned Report No: 382 (iBids 7506)
Contractor: Biodiversity Solutions
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Background

Volunteering has underpinned biological recording since the nineteenth century and shaped the development of many organisations and groups. A strong policy driver for biological recording has started to change the shape of the biological recording community and place greater demands on volunteers' work.

This research explores the current activity of schemes, group and projects in Scotland and their role in working with, and supporting, volunteer biological recorders. The project comprised two elements: a literature search of existing work looking at biological recording and volunteering; and two surveys, one of 168 individual volunteer recorders and another of 48 coordinators of volunteer recording schemes, groups or projects. These examined the role of volunteers in biological recording, to what extent they met the needs of organisations and what support and help recorders received.

Main findings

- 81% of the biological recording coordinators reported that data quality from volunteers was high, but the numbers engaged in biological recording inadequate. Only 23% reported that current effort met their needs; 60% found geographic coverage a problem.

- Attracting more people to biological recording requires clear and simple ways of engaging, and support networks to help with training, directing effort and motivating volunteers.

- 36% of individual recorders would value more training. Support in maximizing new technologies is important. The Field Studies Council reported the use of technology for recording as one of the most requested training courses in Scotland.

- 39% indicated that help with identification would encourage more and better recording. Motivating factors varied: most cited altruistic reasons; 19.5% mentioned contributing to wildlife conservation and 15.5% contributing to research as factors. All these factors should be taken into account when engaging volunteers in biological recording.

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1   INTRODUCTION AND METHODOLOGY

1.1   Research Brief

Scottish Natural Heritage (SNH) commissioned this research carried out by Biodiversity Solutions in 2010. The objectives of the project were to help SNH to "understand how best to increase the numbers and range of people and organisations involved in voluntary biological recording and to increase the total pool of available skills and knowledge. We envisage doing this by developing better gateways and clearer routes through which people can get involved and can further that involvement in voluntary biological recording."

The research was to "review and investigate:

- current activity of recording schemes, societies, groups and organisations in Scotland
- organisational blockages to wider participation, including deficits in 'mentoring skills', organisational capacity and resources
- current and projected species and habitat data needs in Scotland
- the actual and potential capacity for voluntary recording to meet current and projected data needs
- current and future gaps in skills, data and recording capacity
- lessons that can be drawn from recent local and national recording projects, practice elsewhere in the UK, and current opportunities in Scotland (e.g. BRISC Wildlife Counts, OPAL, BTCV Natural Talent scheme, the Biodiversity in Glasgow Project, Natural England policy)
- what a framework might look like to resource and manage actions to address our key aims for voluntary biological recording (who might be involved etc)

This research will not investigate the related fields of data management and supply including data sharing, data mobilisation, data quality, and data ownership."

1.2   Research methodology

This research was conducted in four stages:

1.2.1 Desk study

This study included looking at previous research into volunteer biological recording and volunteering in general as well as examining the results of various projects specifically involving volunteers in biological recording. Over twenty reports were analysed to clarify the issues associated with volunteer participation in the outdoors and with biological recording in particular.

1.2.2 Telephone interviews

Fifty four key Scottish recorders and scheme organisers (see Annex A) were interviewed to hear their views of the state of biological recording in Scotland and what might be done to improve it. These were mainly people with a long record in recording and/or with a direct involvement in significant recording schemes or projects which had a recording component. Each telephone call (averaging 20 minutes long) was structured around a series of points specific to that individual. In the course of the conversation references to other relevant schemes or individuals were noted and followed up. Every interviewee was asked to fill in the scheme, group or project coordinator's questionnaire and the individual recorder's questionnaire, as appropriate.

Comments from these interviews have helped form and structure the discussion and conclusions.

1.2.3 Online questionnaires

Two online surveys were developed using a proprietary on-line survey system. One was designed to gather basic factual information about a sample of the schemes, groups and projects involved with biological recording in Scotland (see Annex C). This was sent to a wide range of people gathered from background research, known contacts and from the results of the telephone interviews. The questionnaire was online between 18th February and the 26th March 2010 and 48 schemes, groups or projects responded (see Annex D for a detailed breakdown of the individual organisations that replied) and the analysis of the findings from the questionnaire is given in section 4.

To understand the effectiveness of these schemes, groups and projects the second survey was designed specifically for individual recorders (see Annex B). This was distributed widely both through various schemes, groups and projects emailing to their contacts or advertising it on their websites and a number were sent out directly to key recorders. The questionnaire was online between 18th February and the 26th March 2010 and 168 individual volunteers responded to it. The analysis of the findings from this questionnaire is given in section 3.

1.2.4 Workshop

A workshop was held on 16th March 2010 at SNH Battleby to provide some initial feedback on the findings of the project. Participants were asked to contribute to problem solving around some of the issues arising from this project, based on their own experiences. The 14 people who attended were invited because of their experience of volunteer biological recording. Bringing together a range of people from this sector allowed discussion around the common factors which motivate, enable and reward the people who volunteer.

The workshop included an introduction to the project and the workshop by Chris Sydes (SNH), a presentation of issues arising from the research and a summary of the survey results by Alastair Sommerville and Sara Hawkswell (Biodiversity Solutions). This was followed by a discussion based on key issues arising from the research findings, structured around the key stages in volunteer development.

The outcomes from this workshop modified the findings of this work.

1.3 Structure of the report

The report of this research work follows a standard format for presenting research and its findings.

Section 1 – introduction. Identifying the purpose of the research and outline methodology.

Section 2 - the context for volunteering and biological recording. This is primarily based on a literature review presenting the current known status of biological recording, volunteering, environmental volunteering and volunteering in biological recording.

Sections 3, 4 and 5 – results of survey work and findings. These three sections present the information collected through three survey techniques, an on-line survey of individual volunteer recorders, an online survey of scheme, group and project coordinators and a telephone survey of key individuals within the field of volunteer biological recorders.

Section 6 - discussion. This discussion section draws together findings for all the key areas of work – two on-line surveys, telephone interviews and literature research - and identifies key successes and barriers to progress.

Section 7 - conclusions. This section collated the main conclusions from the research work and also identifies a framework for action identifying eight key actions needing to be taken in the development of volunteer biological recording projects.

2 THE CONTEXT FOR VOLUNTEERING AND BIOLOGICAL RECORDING

Biological recording has always had its roots in being led by amateurs or volunteers. Amateur collectors had a key role in developing natural history collections in the nineteenth and early twentieth centuries and were the first real biological recorders.

The study of wildlife in Scotland expanded dramatically in the Victorian era with the foundation of many local natural history societies. These were dedicated to exploring and describing their chosen area and opened their membership to anyone who was interested (Finnegan, 2009). It was during this time that the structures of societies was also devised (committee structures, agendas, minutes etc) and these have survived virtually unchanged in those societies which are still in existence. Members of these societies pioneered a wide range of surveys of the flora and fauna, and the majority published their findings in the society's publication (for example The *Forth Naturalist and Historian* or *The Glasgow Naturalist*).

Natural history societies have continued to be formed ever since along the same lines, often including local history and archaeology in their objectives. However, although about 35 local societies still remain (a few of which have been founded relatively recently) most have declined in status and have mainly elderly members.

Their place has mostly been taken by UK wide voluntary conservation based bodies with some professional staff with the voluntary component organised into local branches or groups. These organisations undertake a wide range of projects from lobbying to practical management but all have a component of survey and monitoring. Many of the larger UK organisations have set up staffed offices in Scotland (e.g. BTO, RSPB, Butterfly Conservation, BSBI, Bat Conservation Trust, Plantlife, Bumblebee Conservation Trust, Marine Conservation Society).

Unlike many other forms of environmental volunteering many of the individuals who carry out biological recording do so informally (that is to say outwith any organised volunteering structure). It is equally true that a lot of volunteering in the context of biological recording is not always recognised as volunteering because it takes a different structure to the traditional volunteering routes, for example individuals participating in public recording schemes, contributing data on, for example, road kills or garden records.

In the last 20 years a lot of research and development has developed formalised structures for volunteering, there are now many organisations that support volunteers across all sectors or help organisations develop successful volunteering policies and programmes. With a few notable exceptions the biological recording sector has not engaged fully with this new movement. What is unclear is whether this is because the way in which volunteers operate in biological recording is genuinely different to other fields of volunteering or whether most volunteering in biological recording has been driven by the science and less inclined to take into account the social value of biological recording.

2.1 Biological recording in the UK.

2.1.1 The policy context

The major review of biological recording in the UK carried out by the Coordinating Commission for Biological Recording (1995) catalogued all of the various organisations involved in recording, survey methods, record holdings and issues connected to data handling. It considered the concept of a national system of biological recording and what it might need to implement it. Although the role of volunteers was recognised it did not specifically identify either their contribution or what might be required to encourage more voluntary recording.

The following development and expansion of the National Biodiversity Network, including the network of local records centres, has increased awareness of the need for biological data

and the role of the wide ranging network of local and national recording schemes and groups in contributing to this.

In parallel with this in 1994 the UK Government produced the UK Biodiversity Action Plan and established a Biodiversity Action Plan Steering Group. This in turn led to the formation of country biodiversity action groups and local biodiversity action plans concentrating on setting up systems, partnerships and priorities, and collecting and collating existing data on which to base the species and habitats action plans.

In Scotland the Biodiversity Strategy (Scottish Executive, 2004) sets out a framework of priority species and habitats and clearly identified data needs to help deliver and monitor the strategy. The Strategy also identified that everybody has a role in conserving Scotland's biodiversity. Specifically, individual responsibility is identified as one of the sectors that need engaging, and one of the mechanisms for people meeting their individual responsibility is "by participating in surveys and monitoring programmes". The agenda for action included: "Engage a far wider range of people, and resource users in particular, in gathering information about the state and quality of their environment and associated biodiversity".

As biodiversity has gone up the political agenda so has the need for data to enable effective delivery and monitoring of policies. This in turn is reflected as the biodiversity strategy became embedded in wider policies including Scotland's Sustainable Development Strategy (Scottish Executive, 2005), which calls for "The environment to be protected effectively, on the basis of evidence and using the best available science". Biodiversity is a "key challenge" considered in the development of the 2nd National Planning Framework for Scotland (Scottish Government, 2009) (other key challenges include waste, transport and energy). This framework specifically links biodiversity with sustainable economic growth and the need to respond to and work with climate change.

2.1.2 Biological recording in practice

Many of the larger voluntary conservation societies, and most of the local authority Ranger Services, have taken a lot of interest in getting the public involved in recording either through widely publicised projects (e.g. The Big Garden Birdwatch run by the RSPB) or through small scale ranger led wildlife walks. Obviously these initial steps have to be based on common, easily recognised species but may be a key route into more serious recording.

For the more specialised species there is a plethora of recording schemes (73 invertebrate schemes with at least 14 others covering non-invertebrate groups) all of which cover the UK. These can be run by organisations interested in all aspects of the species group (e.g. The Malloch Society researching into the ecology of flies including their distribution and bringing professionals and volunteers together) or primarily interested in recording the distribution of species (e.g. the Elateroidea Recording Scheme). A few of the species recording schemes operate from Scotland (e.g. those covering mayflies, water-beetles, longhorn moths, stoneflies, barkflies, terrestrial flatworms, bumblebees). There are a wide variety of local clubs in Scotland specialising in particular species groups, most areas have a local bird club and/or ringing group, a badger group and bat group, but there are also a variety of other groups such as amphibian and reptile groups and dragonfly groups.

There are many individuals who have not only a specific interest but several interests and contribute their records to a number of recording schemes (for example a bird watcher recording butterflies during the summer months). The Highland Biological Recording Group has recognised this fact and has helped bring together and encourage recorders with a very diverse range of interests within the Highlands. It follows that one person could contribute to many different recording schemes and belong to several different societies as a result. However, as in the past, some recorders are dynamic and driven individuals who can have a disproportionate impact on our knowledge of the less well known species in particular.

2.2 Volunteering in the UK

2.2.1 The policy context

Volunteers offer their services for free – we rely on their goodwill. This does not mean that there is expectation of nothing in return. Different volunteers will have different reasons for giving up their time to help and will have different expectations. Managing these expectations is an important component of working with volunteers. However, many volunteers volunteer for altruistic reasons – i.e. they are doing it for the good of others and expect nothing in return. Volunteering is now widely recognised as being a form of active citizenship.

The Scottish Executive's Volunteering Strategy (Scottish Executive, 2004) developed these aspects and provided the definition "volunteering is the giving of time and energy through a third party, which can bring measurable benefits to the volunteer, individual beneficiaries, groups and organisations, communities, the environment and society at large. It is a choice undertaken of one's own free will, and is not motivated primarily for financial gain or for a wage or salary."

It also concluded that to be successful a programme engaging volunteers should ensure that "volunteer recruitment should be inclusive, and that the opportunities themselves should be varied and interesting, accessible, provide appropriate training and skills development, offer recognition, and where practical, be more flexible in terms of when and how often volunteers are needed. In other words, they must meet the needs of the volunteers."

A National Survey of Volunteering and Charitable Giving (Cabinet Office, 2008) was carried out by the National Centre for Social Research in partnership with the Institute for Volunteering Research during 2006-2007 (the survey interviewed just over 2,700 adults in households in England). This survey found that "three-fifths (59%) of the sample had given formal volunteering help through an organisation in the last year, while two-fifths (39%) had done so on a regular basis (at least once a month). On average, formal volunteers had spent 11 hours helping over the last four weeks."

Of the respondents to this survey 4% volunteered with organisations working in Conservation, the environment and heritage, which covered 8% of those currently volunteering. It was noted that "the proportion of volunteers tended to be higher among those in the 34–44 and 55–64 age brackets, women, respondents in work (although there was much variation in the non-working group), those actively practising a religion and those not in a group at risk of social exclusion". This survey estimated that formal volunteering contributed £38.9 billion to England's economy.

2.2.2 Support for volunteering

There is considerable support for the voluntary sector through a wide range of organisations such as Volunteer Development Scotland (VDS) and the Scottish Council for Voluntary Organisations (SCVO).

The Volunteer Centre Network in Scotland has 32 local Centres which provide a liaison point between volunteers and volunteer opportunities. The Centres provide support to volunteers and help develop and meet the local needs of the volunteers. They can provide organisations with support in terms of recruitment, volunteer policies etc.

Volunteer Development Scotland is a membership organisation and Scotland's "centre for excellence" in volunteering. VDS provides practical advice and support to organisations working with volunteers to help them build their skill sets and be up to date with current information. VDS runs Investing in Volunteers Award which recognises organisations' commitment to high quality volunteer involvement. Currently there is a subsidy for organisations in working towards this award.

More specifically there is now a focus for environmental volunteering though the Forum for Environmental Volunteering Activity, FEVA. This is a Scottish initiative to establish a

network of national not-for-profit organisations with an interest in Environmental volunteering to share best practice and ideas. Currently FEVA employs a Volunteer Management Development Officer (based at BTCV Scotland as part of their Life Skills team).

2.2.3 Environmental volunteering

Significant work has been done recently looking at the role of volunteers in contributing to a wide variety of environmental fields, both in terms of the delivery of environmental objectives but also as part of the mechanisms available for delivering health and well-being objectives.

An analysis of the opportunities for environmental volunteering to deliver Scottish Government's policies (Dalgleish, 2006) illustrates how environmental volunteering can have a key role in delivering objectives in a range of policy areas including health, education and skills, environmental justice, equalities, employability, youth, older people, citizenship and nationhood, and rural and forestry policy.

Similar work carried out in the UK looking at the work of The Wildlife Trusts (Institute for Volunteering Research, 2006) noted that "for many people, volunteering acted as an important point of social contact, a source of friendships and an opportunity to work as a team." "On a more practical level, a number of volunteers talked about gaining new skills and knowledge, and some felt their employment prospects had been enhanced".

More recently SNH's vision for environmental volunteering (SNH, 2008) states that "through environmental volunteering, more people in Scotland will take positive action for the natural heritage and in doing so will enjoy benefits to their quality of life and well-being." The Policy recognises a range of benefits to individuals in carrying out environmental volunteering including:

- "Quality of life and well-being. Individuals benefit from volunteering in a number of ways. Volunteering should be an enjoyable experience, offering physical exercise and mental refreshment, and opportunities to bring people together to share experiences and build self-confidence and a sense of achievement.
- Understanding of the natural heritage. Volunteering gives people close first hand experience and offers opportunities to develop peoples' understanding of the natural world, and ways in which it can be cared for and improved, in a way that is not usually possible through other outdoor activities.
- Commitment to positive action for the natural heritage. Volunteering connects people to the environment and builds commitment to caring for its future. Involvement in volunteering can lead to people taking further positive action for the environment, and to developing more sustainable lifestyles, as they make links between the health of the natural heritage and resource use.
- Skills and career development. Volunteering offers the opportunity to gain work experience and develop new skills, and is an important route into employment in the natural heritage"

It is important to note that there are a number of barriers to environmental volunteering. The Heritage Lottery Fund is a major funding source for many volunteer recording schemes and in their current guidance (Heritage Lottery Fund, 2009) identifies some of the barriers to volunteering including the cost to the individual; physical barriers for people with disabilities; cultural barriers (within the organisation or group), and childcare problems.

Work carried out for SNH by Volunteer Development Scotland (SNH, 2007) across the full range of natural heritage volunteering in Scotland noted that Volunteers Centres and SCVO were the least used sources of recruitment of volunteers compared with local media, websites, local networks etc.

2.3 Volunteering and biological recording

2.3.1 Volunteers in biological recording

In the current context volunteering in biological recording delivers both social and environmental objectives. These two strands need to be integrated for a voluntary biological recording project to be truly successful. Consideration should be also given to the particular issues that affect volunteers carrying out biological recording work. Organisations running biological recording projects engaging volunteers need to bring all these issues together to develop successful volunteer biological recording programmes.

Volunteers contribute to biological recording in a variety of ways, not only in collecting field data, but in sorting samples, identifying and curating specimens, processing and managing data and coordinating and managing projects and organisations.

In the Economic and Social Research Council funded 'Amateurs as Experts' project (English Nature, Lancaster University and the Natural History Museum, 2005), Lancaster University's social scientists studied and advised on the processes that engage people in knowing about biodiversity. The project brought together social and natural scientists, amateur expert naturalists, anglers, ramblers and some of the UK's Conservation Agencies to try to understand the range of ways in which different communities might best be encouraged to contribute their knowledge for the biodiversity project.

The work concluded that "indeed, for many dedicated folk, immersion in nature is a deliberate antidote to the workaday world. An individual's study of a wild species is generally an end in itself, undertaken out of wonder or love, or for deeper shared involvement in what's locally distinctive, or simply to advance knowledge for its own sake".

"Some amateur expert naturalists believe that what they do would be hedonistic if they did not contribute biological records to their Vice County recorders, local councils and/or record centres. They may feel they owe this contribution to science and to policy but also to the natural world which deserves protection. They thereby establish a contract with nature as well as one with their fellow naturalists, and with those responsible for biodiversity protection."

The report specifically looked at the role amateur naturalists play in providing data for conservation agencies; it recognised that there is a key role here, however that the relationship can be uncomfortable and that the staff from conservation agencies need to have a greater understanding of what drives volunteer recorders. The work found that amateur expert naturalists also make some strong assumptions about conservation agency staff, including:

- "agencies will lose amateur expert naturalists' data and will not recognise them for their contributions
- agencies will grant amateur expert naturalists little or no say about what data is used for
- policy only wants data and is not interested in the well being of amateur expert naturalists as individuals or communities".

A study by the Tracking Mammals Partnership and National Biodiversity Network (NBN) (2005) identified the advantages of working with volunteers. These included better site coverage, as volunteers can cover many sites or locations and if necessary over short periods of time; volunteers are often highly motivated and have unique local knowledge of areas. It is also economic as not only are the costs of using staff tenfold that of using volunteers but many volunteers will meet their own costs of travel etc. The disadvantages of working with volunteers included a level of uncertainty such as whether the work will be completed or the data returned; volunteers often need more intensive management than paid professionals; there is often a lack of the necessary skills, and generally there can be low motivation for some routine recording work.

Specific guidance from the Heritage Lottery Fund (2010) on biodiversity lists engaging volunteers in biological recording, data and information projects as one of the types of biodiversity projects it can fund. This can include working with volunteers to develop biological identification and recognition skills and involving them in monitoring, including providing training. "We are keen to encourage people to take an active interest and participate in projects with good opportunities to enjoy and contribute to sustaining the UK's biodiversity".

2.3.2 Effective volunteer recording projects

More recently a number of studies have looked at what makes voluntary biological recording projects successful. English Nature (2003) carried out an analysis of current projects involving volunteers in marine recording which showed that the successful ones provided the project organisers with large volumes of good quality computerised data which met the funders' needs while the volunteers had fun, learnt about marine life and met like-minded people. Conversely the poor projects had not enough participants, only provided poor quality data on paper sheets with the resultant negative feedback from sponsors. The volunteers in such projects were frustrated by lack of feedback with no help or advice to hand and they learnt nothing new. These lessons apply to recording projects in the terrestrial environments as well as marine.

The report from the Tracking Mammals Partnership and NBN (2005) noted that survey objectives must be clear to the volunteers especially what they are being asked to do and why they are asked to do it. Without doubt there is a need to maintain the volunteer network, both retaining existing volunteers and recruiting new volunteers over a period of time as there will always be a rate of turnover whatever the size of the scheme. An experienced volunteer is a high value asset and maintaining their interest is essential. This means providing feedback to ensure that they know they are carrying out a worthwhile task and that they know how and where their data are being used.

It is clear that volunteers need guidance on what they are being asked to do. For marine surveys a workshop report from the Marine Life Information Network (MarLIN, 2008) highlighted the problem that volunteers faced in not knowing where to send their data and concerns that data are lost as a result of this confusion. Volunteers need to know who to supply their data to and that they will be passed on to relevant bodies on their behalf. In the marine recording community solutions included the 'Sealife Signpost' where information about the survey is made available by promoting the MarLIN 24-hour Recording Hotline phone number, guidance on what to record is provided via stickers put up in diving clubs, boathouses etc and a web page showing the relevant organisations to contact.

A recent Biological Recording in Scotland (BRISC) project, 'Wildlife Counts', specifically set out to create biological records, engage with volunteers and raise awareness of biodiversity. The conclusions from this project (BRISC, 2008) provide some key lessons:

- The process is a long-term investment, short-term projects engaging volunteers must link into long term programmes for volunteer support and development
- Recording work carried out, whether by a beginner or expert needs to feed into some framework to ensure that records are used and made available. Feedback must be available from this framework to volunteers so they know who uses their records and how.
- Biological recording can be an effective mechanism for getting people to engage with their local environment and develop a wider understanding of its complexities.
- Key volunteers can be nurtured, who in turn can support, train and develop new volunteers.
- Need to balance expertise in developing/running volunteer biological recording projects and knowledge of biological recording, ecological/taxonomic expertise and volunteer development.

3 RESULTS OF THE SURVEY OF INDIVIDUAL VOLUNTEERS

This Section summarises the results of the survey of individual volunteer biological recorders carried out on-line between 18th February 2010 and 26th March 2010. Full details of the questions are given in Annex B.

This summary covers each of the six main sections of the survey and for many questions gives the detailed results. Others, for example where respondents were asked to give comments, are summarised to illustrate the responses.

A total of 168 individual volunteers responded to the survey.

3.1 About you and your interests

What subject areas are you interested in?

This was a mandatory question and respondents were allowed to give as many responses as they wished. Sixteen respondents ticked the 'other' category however on review of the information given to support this it was possible to reallocate all these to one of the existing categories, or the box had been used to enable people to give more detail. In Figure 1 below the data presented are the revised data, with answers under 'other' re-categorised.

Figure 1   Area of interest given by respondents
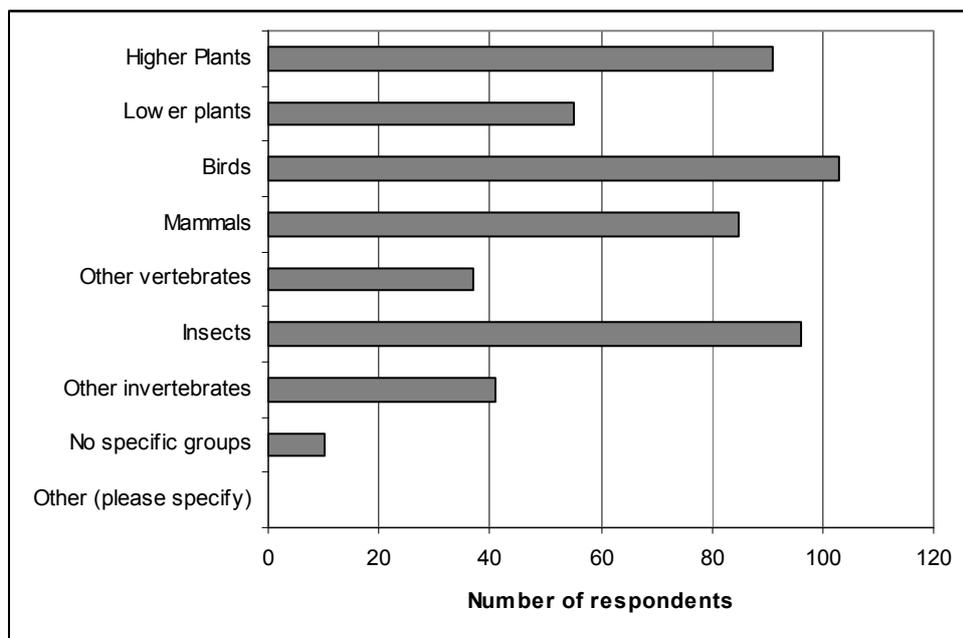
Although it would appear that there is poorer representation from respondents interested in lower plants (32%), other vertebrates (21%) and other invertebrates (24%) this would be expected given the known interest in these groups.

It is interesting to note that majority of respondents were interested in more than one group with the mean (average) number of responses being three. Ten respondents were not interested in any specific group.

How often do you do biological recording?

This was a mandatory question, with only one option allowed for each respondent.

An astonishing 14% of volunteers carried out biological recording activity every day and only 24% carrying out biological recording once a month or less. 61.5 % of respondents carried out biological recording somewhere between two or thee times a month or two or three times a week.

Figure 2   Frequency that respondents carry out biological recording
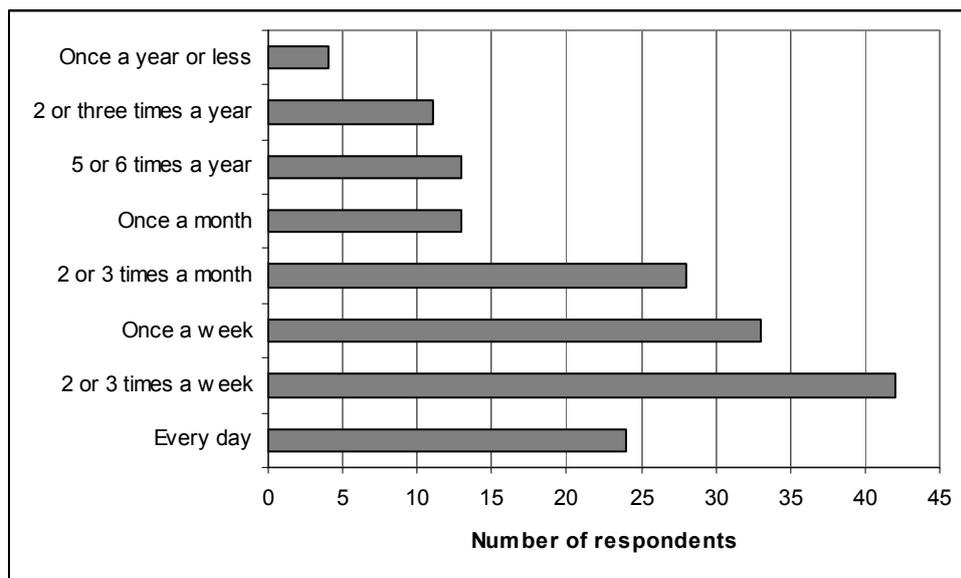
Is your recording activity restricted to any particular seasons?

This was a mandatory question, with respondents allowed to give more than one answer. 76% of respondents carry out recording activity all year round, with only two respondents (1%) recording specifically in the winter.

Figure 3   Seasonal variation in recording activity
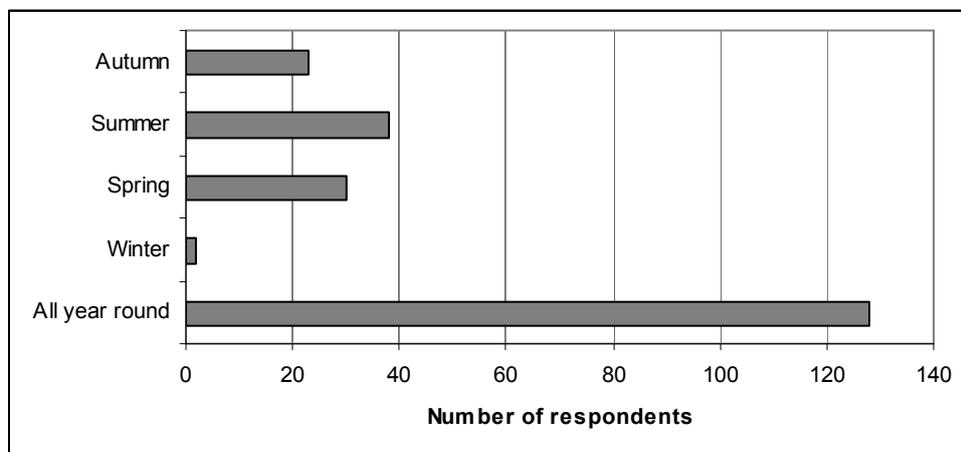
Approximately how many biological records do you make in a typical year?

Thirteen respondents skipped this question.   Five respondents gave ranges, for the purposes of interpreting these data the top end of the range has been used.

Figure 4 shows the considerable spread in the number of records made by individual recorders. 2% of recorders make over 10,000 records (the maximum number reported being 20,000 records) with a total of 53% of respondents making over 200 records. 47% of individuals make 200 records or fewer annually, with 20% making 25 or fewer records annually.

10

Figure 4   Number of biological records made annually by individual recorders
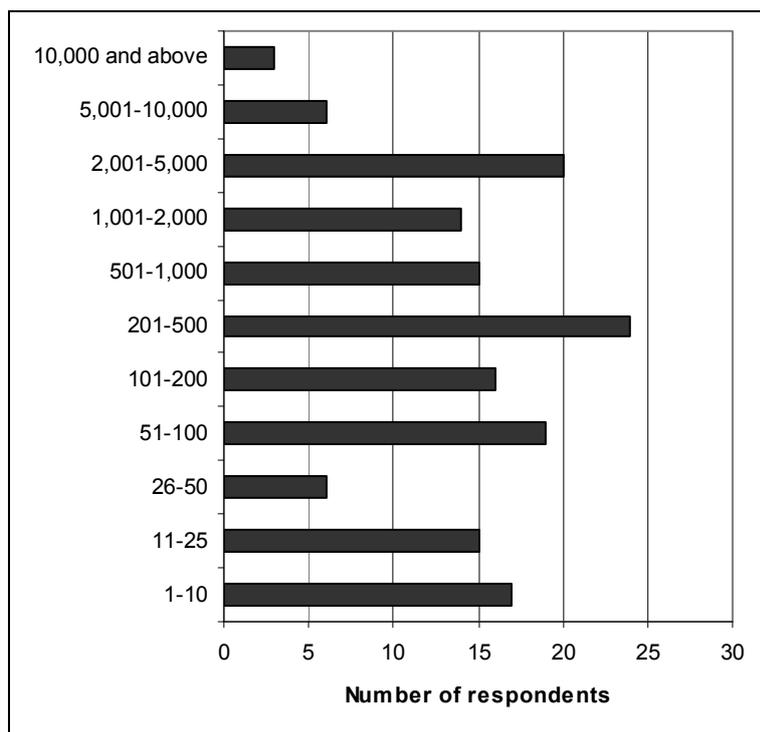
Would you consider yourself to be?

This was a mandatory question. It is important to note that no additional guidance as to how individuals should categorise themselves was given and therefore there is a high degree of subjectivity in these data.

Figure 5   Skill level in biological recording selected by respondents
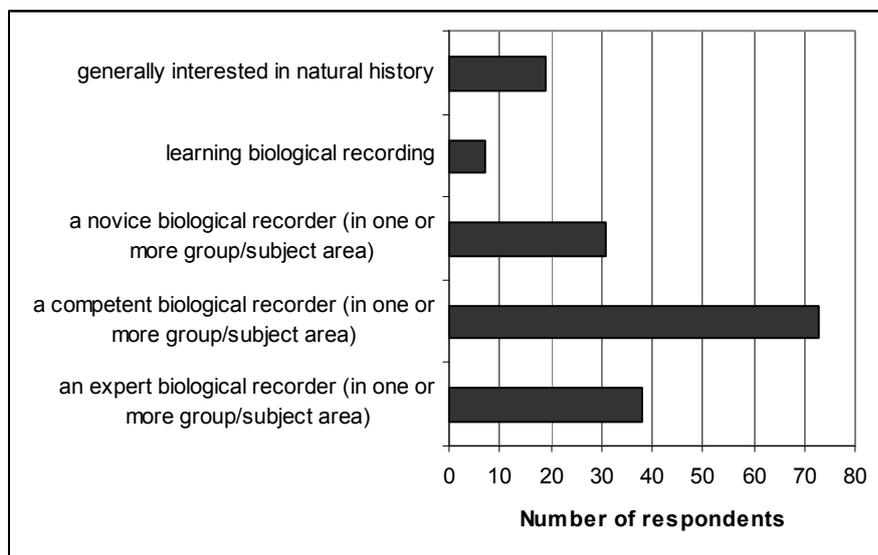
The majority of respondents categorised themselves as 'competent' biological recorders (43.5%) with a further 22.5% choosing the category of 'expert' recorder. The remaining 34% of respondents categorized themselves as either a novice biological recorder, learning biological recording or generally interested in natural history. This split may reflect the type of people who were willing or felt competent to complete the survey.

3.2 Motivation

How did your interest in biological recording begin?

This was free text question enabling respondents to answer in their own words. To assist with analysing these data the responses were categorised into the eight main themes that emerged. It was not possible to categorise four of the responses which did not clearly give any starting point for the interest.

Figure 6   Categories showing how an interest in biological recording started
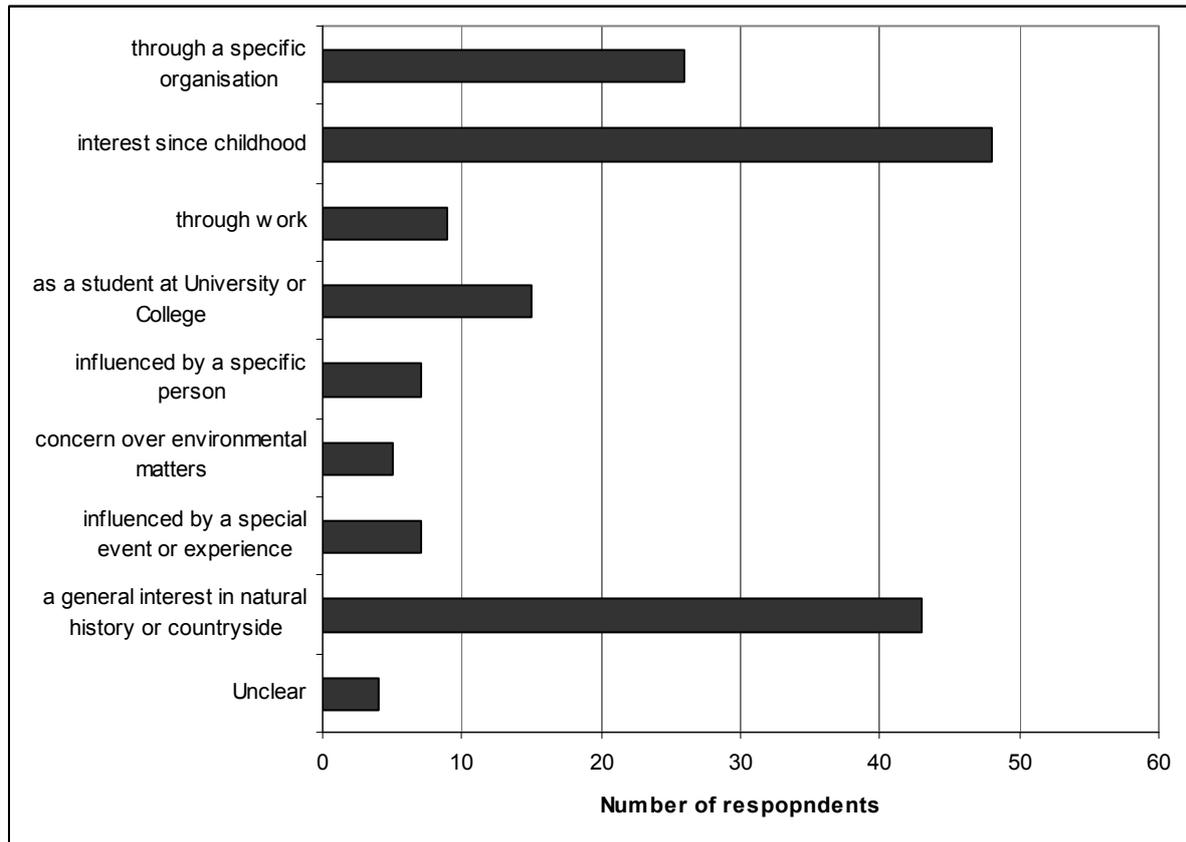
The two main categories identified are a general interest in natural history or countryside (26%) and an interest since childhood (30%).

Examples of the responses in each of the categories:

A general interest in natural history or countryside

> *retired into the area of the reserve*
> *Fly fishing*
> *bird watching /photography*
> *Love of wild flowering plants*
> *Wanting to understand more about the biodiversity around me*

Influenced by a special event or experience

> *Took part in the BIG project in Glasgow recording birds and Butterflies. also recording for BTO garden Birdwatch.*
> *It began 4 years ago when we moved to Scotland and joined our local SOC*

Concern over environmental matters

> *concerned the planet is facing a bigger threat just now through the use of agrochemicals than it has ever faced before*

Influenced by a specific person

Colleague with similar interest teaching me

As a student at University or College

At university

College course in countryside management

Studying animal biology at uni

Through work

A Project Scotland apprenticeship at North East Scotland Biological Records Centre (NESBReC) in habitat mapping and biological recording, accompanied by multiple identification training days covering different groups.

contract work with RSPB in 1974

Interest since childhood

collecting shells as a child

Started 50+ years ago when I was in the Bird Group at my school.

By being given as an eleven year old boy a set of illustrated books on British wildlife which opened my eyes as to what might be outside in my garden. Exploring the garden proved that there were hundreds of fascinating creatures to be watched and recorded.

Forced to by my dad! :-)

As a young child turning over stones and marvelling at what is underneath.

My granddad introduced me to natural history when I was 5

Childhood. A large garden. Parental enthusiasm.

Through a specific organisation

Initially volunteering for the RSPB and in doing so gaining knowledge about species, identification and recording

Attending Dumfries and Galloway Environmental Resource Centre courses

Through SWT and latterly BSBI

Membership of the Paisley Natural History Society

Why are you involved in recording?

This was a mandatory question, with respondents allowed to choose as many options as applied to them. Most respondents gave more than one reason with a mean (average) of 4.6 different responses per person (see Figure 7).

The reason with the highest number of respondents was 'to contribute to wildlife conservation' (19.5%) closely followed by 'to gain further knowledge of the subject' (17.5%) and 'to contribute to research' (15.5%).

2.5% used the option 'other', the comments they made included:

Enjoyment - its great fun

Fresh air, recording, cycling, walking, map reading, computing and socialising but above all I can do it anywhere anytime.

personal satisfaction, a positive aspect to our daily walks

health and relaxation - a great hobby - always something of interest where ever you go

Figure 7   Reason why volunteers are involved in biological recording
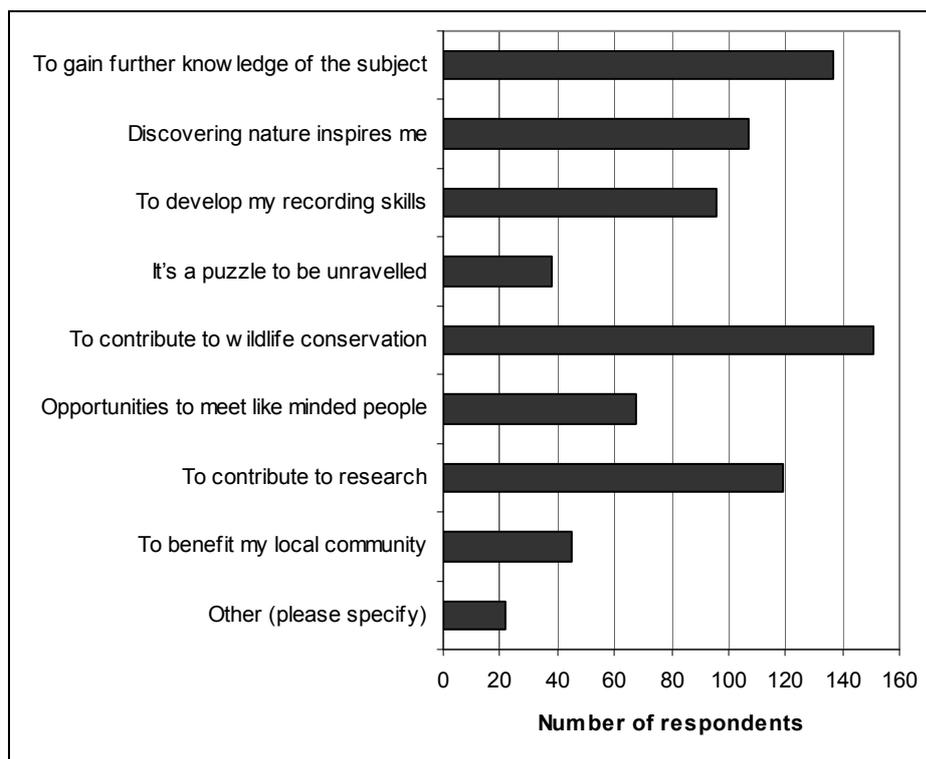
3.3   Involvement with schemes or recording groups or projects

Can you list any recording schemes, projects or groups that you are involved with?

Four respondents skipped this question.

Respondents were asked to list up to five schemes, groups or projects that they were involved in. There were a total of 499 schemes, groups or projects listed with the mean (average) number of schemes listed by respondents was three.

To enable analysis of these responses they were allocated into six categories, although 3% of the responses could not be grouped into any category.

69% of all the schemes, groups or projects listed were part of a national species based recording scheme. The respondent may have been contributing data to, or working with, a local branch or vice-county recorder or may have been working directly to the national scheme. Some of these schemes operate on a UK level and others on Scottish basis.

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Figure 8   Categories of projects respondents are involved with
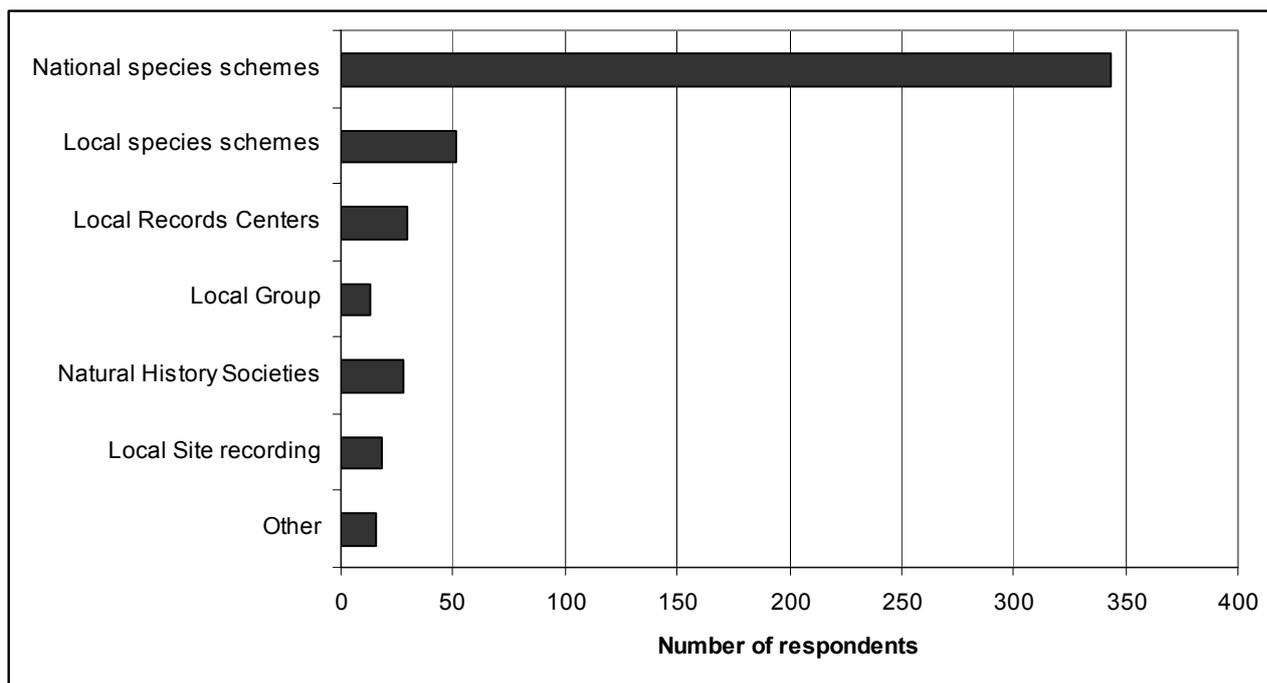
Can you select one of the above recording schemes, groups or projects that you would be able to give us more information about your relationship with?

Respondents were asked to select one of the schemes they had listed to comment on. 18 respondents skipped this question.

Using the same categories as for the previous question the schemes were categorised to show which of the schemes, groups or projects respondents had given further information on (see below).

Figure 9   Categories of projects respondents gave further information on
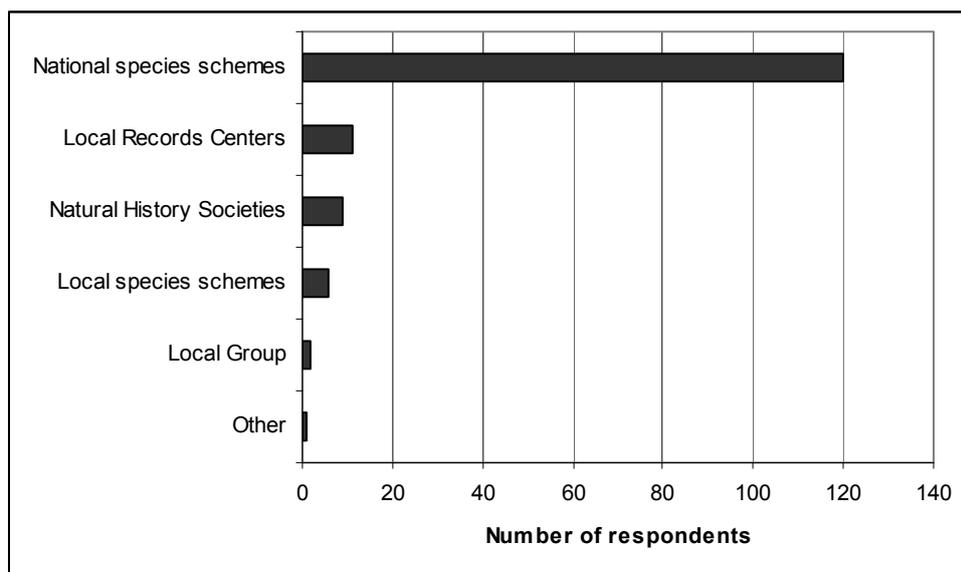
80.5% of respondents gave details relating to national species recording schemes.

In relation to the scheme or group you have chosen above which of the following services are available, which of them do you use and, if not available, would you like?

Seven respondents skipped this question, so the sample size was 161. As this question is related to the previous question, 11 respondents effectively gave details of the services provided but without specifying which scheme this referred to. There was also clearly some confusion in respondents' replies to this question as some respondents claimed to use a service provided by their chosen scheme even though they had not marked it as an available service.

Figure 10 Different types of services from schemes used or wanted.
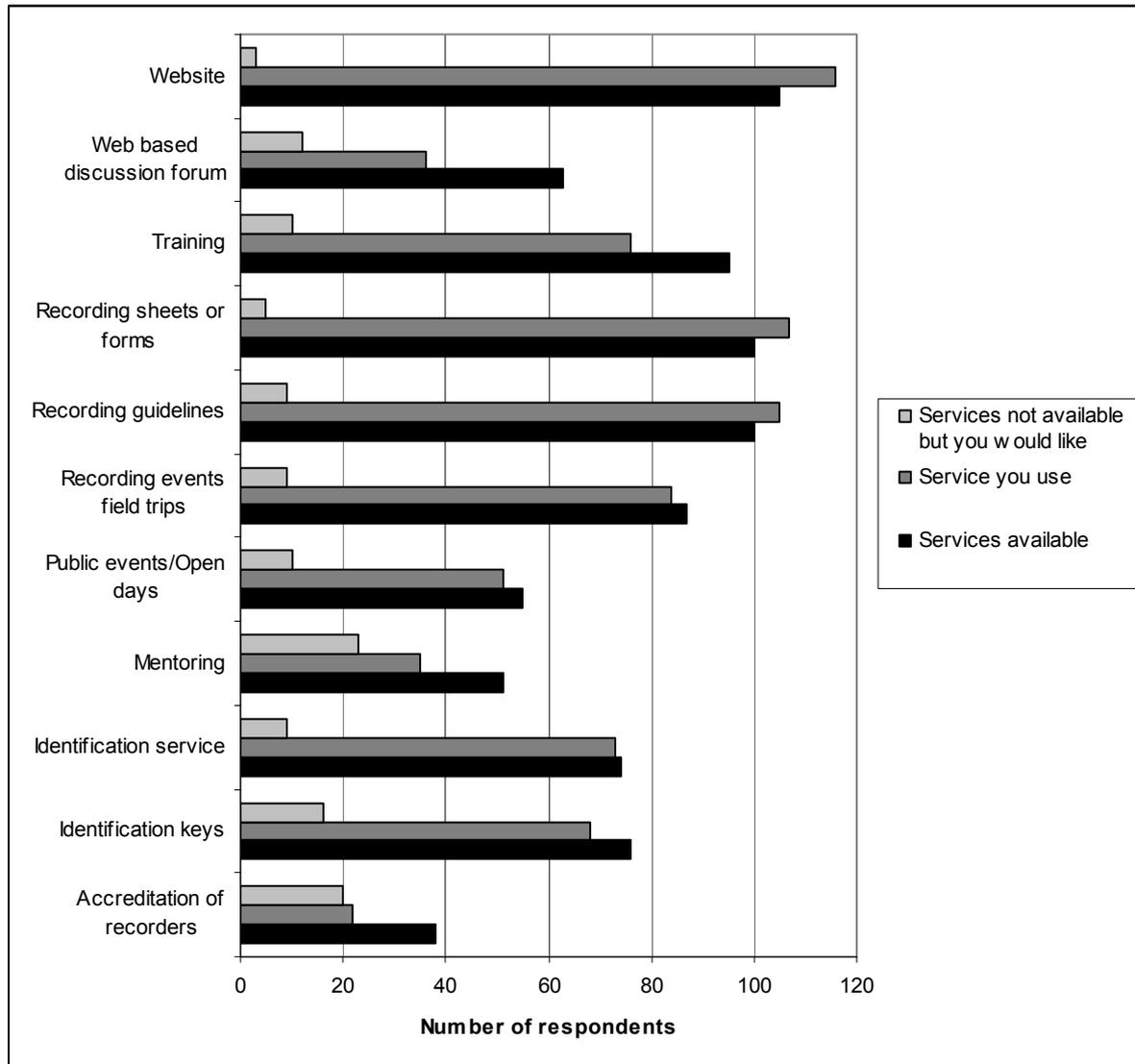
The most commonly used services were recording guidelines (65%) and recording forms or sheets (66.5%).

The least used services were web based discussion forums (22.5%) and accreditation of recorders (13.5%), these were also the services where the lowest proportion of respondent used the services they knew were available. Only 57% of those who knew a web based discussion forum was available used it and 58% who knew accreditation of recorders was available used this service. The only other service for which fewer than 90% of those who knew that it was available but didn't use it was mentoring (69%).

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The two services where more than 10% of the respondents would like to use a services that wasn't available were accreditation of recorders (12.5%) and mentoring (14.5%)

3.4 Other

What would encourage you to do more recording?

Figure 11 What might encourage volunteers to do more recording?
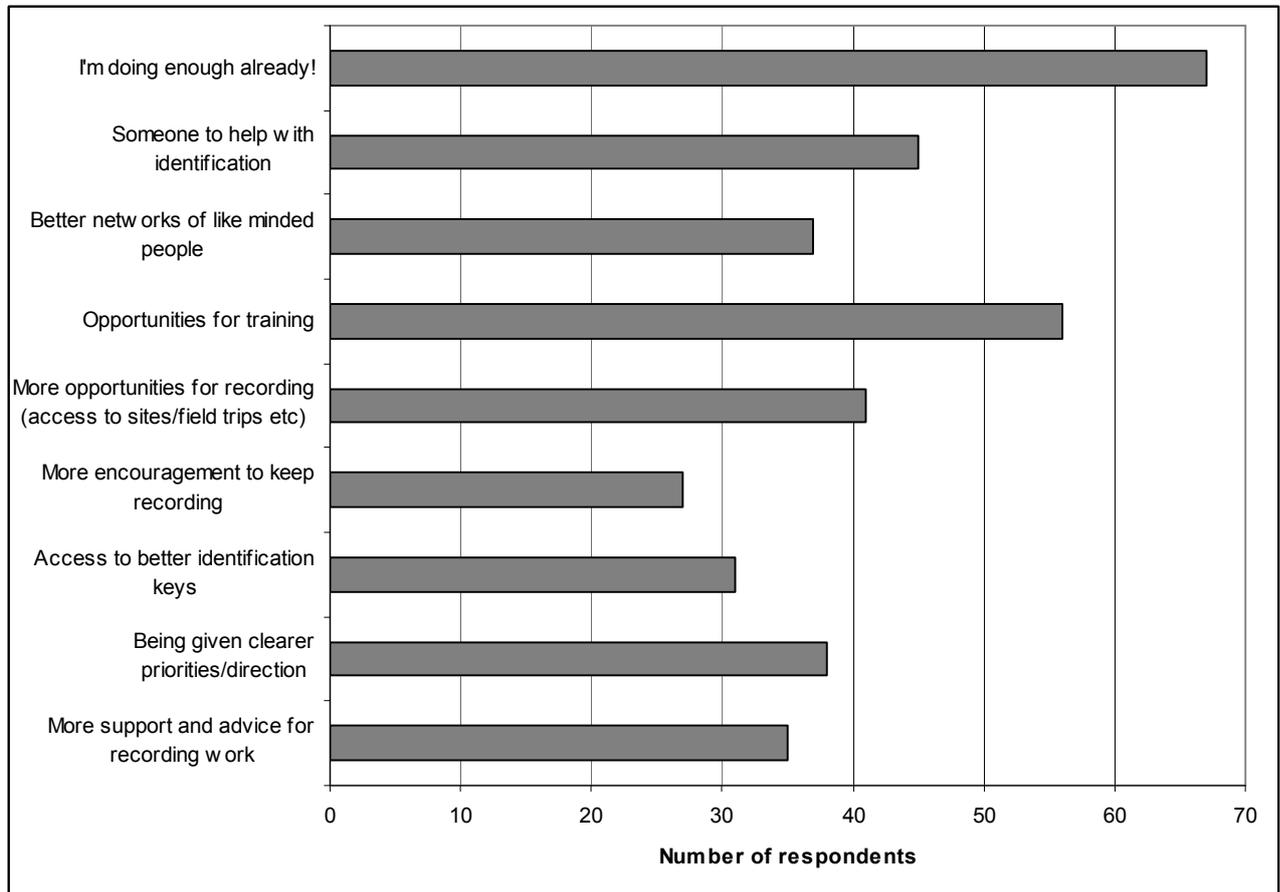
This was a mandatory question, with respondents allowed to select as many options as they wished.

43% of respondents replied 'I'm doing enough already' – although a small proportion of these respondents also gave other comments as to what would make them do more recording.

The two areas which most respondents said would encourage them to do more recording were opportunities for training (36%) and someone to help with identification (29%).

Have you any other comments that might help us with our research?

69 respondents gave additional comments. It was not possible to categorise these in any way.

Examples of the comments:

If I had more time I'd do more!
Don't feel like there's much encouragement for new people.
It is difficult to record invertebrates on SSSI due to the need to collect specimens for identification at home. The current system of licensing for this activity is cumbersome and overly bureaucratic with individual licenses being required for each SSSI. The provision on a general license for individuals to collect on SSSIs would make it easier for recorders to collect specimens and

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therefore contribute records to SNH to ensure that the SSSI is managed appropriately for those species.

Anything that helps recorders who don't have a car

The lack of integrated local and national structures for collecting, analysing and sharing biological data means that records collected by an individual may not be mobilised to their full potential. There is no focus for biological recording in my local area and therefore many records remain largely inaccessible

Access to microscope facilities would be useful for many insect groups.

Don't overlook the fact that people really enjoy recording work - the challenge, the discipline, makes you get out, allows you to use your expertise.

For most invertebrate groups good ID keys are not available and this should be addressed asap using web based keys, digital photos, scanning microscope images etc.

I enjoy very good support for my recording activities in North-East Scotland. The relevant Recorders (both lepidoptera and birds) are very accessible and extremely competent. I think I am very lucky with regard to this.

I'm already overcommitted recording things; the challenge for me is submitting all the data

Living in the middle of nowhere can only do things with others occasionally

Need to develop specialist recording skills - e.g. raptor monitoring. The recording community is ageing rapidly.

Recognition of the huge amount of time, effort & financial resources required by volunteer recorders

Very keen to undertake more survey work, but don't know how to find out where such voluntary activities happen

3.5 Personal information

Respondents were asked to give their name. A small number (4%) wouldn't and a further 2% gave only partial names or initials. The names were only collected in case of any follow up to comments or responses.

Respondents were also asked to choose where they lived from a list of Scottish local authority areas and other UK countries. Three per cent of respondents came from elsewhere in the UK. Most Scottish local authority areas were represented by at least one volunteer recorder apart from the Shetland Isles and Renfrewshire. The largest number of respondents came from Highland with 20% of respondents. Respondents were sought across Scotland and through existing networks and contacts. This means that the spread of respondents asked to complete the survey would not have been uniform. These data do not enable us to draw any conclusions about the number of recorders in any particular area.

What age group are you in?

Figure 12 Age groups of respondents
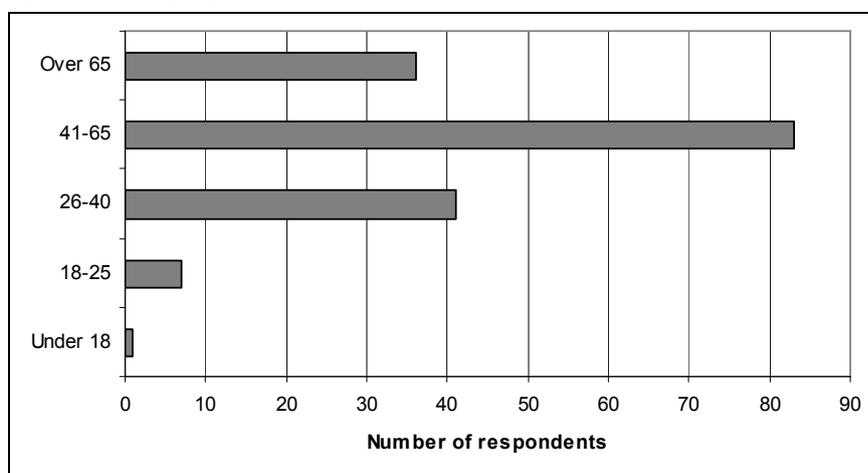
There was only one respondent who was under 18. This is mainly due to the fact that we were unable to get groups who worked with young people to circulate details of the survey to their members mainly due to concerns over data protection issues.

The majority of respondents fell in the 41-65 category (49.5%) with almost equal numbers of respondents in the 26-40 age group (24.5%) and in the over 65s (21.5%).

3.6 For competent and expert recorders only

Only those respondents who had already identified themselves as either 'competent' or 'expert' recorders were asked to complete these questions. However only 111 respondents had identified themselves as being in these two categories but 130 and 131 respondents replied to these questions respectively. This suggests that volunteers who considered themselves to have a lower level of expertise are also providing mentoring and training to other recorders. Looking at the details of the comments provided it would appear that people may consider themselves overall to be a 'novice' recorder but they have higher skills in one particular area where thy can offer training/mentoring.

Do you provide mentoring for new or novice recorders?

Table 1   Competent/expert recorders providing mentoring for novice recorders

	responses	%
Yes	56	42.5
No	75	57.5

Figure 13   Range of subjects taxa? covered by volunteers mentoring novice recorders
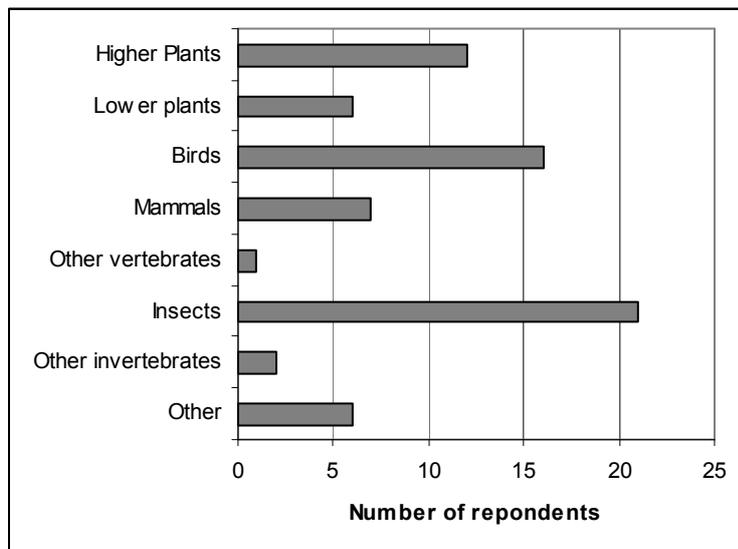
Almost half of those who replied did offer some form of mentoring. The range of subjects that respondents offered mentoring in was widespread. Some subjects were very specific (e.g. barkfly identification) and others offering a wide range of different subject (e.g. invertebrates). Some respondents gave more than subject that they offered mentoring in.

Both birds and plants were strongly represented. It was significant that the highest number of respondents covered insects where there is the largest range of groups and probably the highest demand for mentoring and on-going support.

Other subjects covered included:
> *All aspects of being a recorder*
> *Habitats*

Do you provide training for new or novice recorders?

Table 2   Competent/expert recorders providing training for novice recorders

	responses	%
Yes	63	48.5
No	67	51.5

Approximately half of those who replied did offer some form of training, a slightly higher number than offered mentoring. A high number of respondents (31%) listed more than one subject that they would train in.

Figure 14 Subjects covered by volunteers training novice recorders
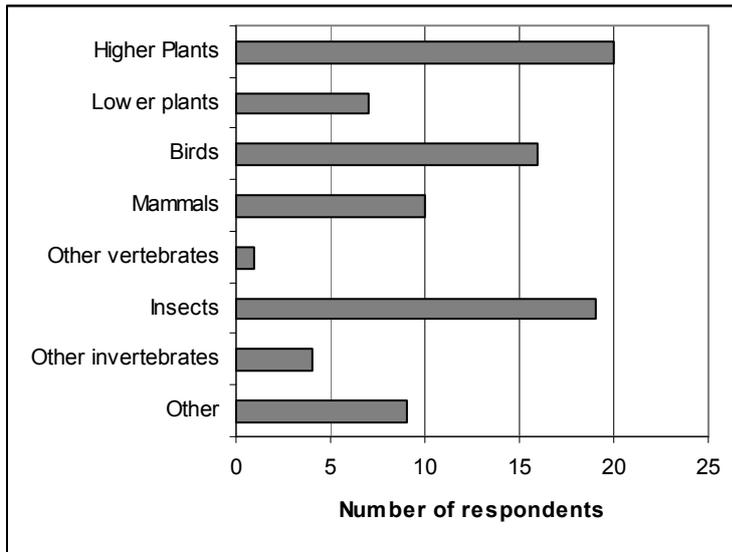
The subjects covered was almost identical to those given for mentoring, with the exception of higher plants on which only 12 respondents provided mentoring and 20 provided training.

Other subjects covered included:
Use of MapMate; GPS
General recording techniques
Biological survey
Habitats

4   RESULTS OF THE SURVEY OF PROJECT COORDINATORS

This section summarises the results of the survey of scheme, group or project coordinators carried out on-line between 18th February 2010 and 26th March 2010. Full details of the questions are given in Annex C and a summary of the projects and surveys themselves is provided in Annex D.

This summary covers each section of the survey and for many questions gives the detailed results.   Others, for example where respondents were asked to give comments, are summarised to illustrate the responses.

The survey of scheme, group or project organisers was responded to by 48 different people, each responding on behalf of a scheme, group or project organised at a local, regional, Scottish or UK level. Seven respondents (14.5%) completed the survey on behalf of their local part of a national scheme.

A list of all the schemes, groups or projects replying is given in Annex D along with summary information about their objectives, coverage, scale of recording and number of volunteers involved.

4.1   Information about your scheme, group or project

This section asked for details of the scheme, group or project, who runs it, contacts details and information about the objectives. Full details of the responses in this section are given in Annex D.

A brief analysis of one key question in this section is given below.

What are the objectives of this scheme, group or project?

To enable some assessment of the data collected from this question the objectives were analysed to see if they covered any of three common themes: collation of data to increase knowledge of species and their distribution; provision of data for conservation action: and, to engage people with biodiversity. Of the forty eight respondents several had objectives which spanned more than one of these common themes.

Table 3   Summary of objectives of schemes, groups and projects

	responses	%
collation of data to increase knowledge of species	35	73%
provision of data for conservation action	17	35%
to engage people with biodiversity	6	13%

Analysis of these data should be done with care as it is not to say that data from a scheme with the objective of increasing knowledge of species is not used for conservation work and the scheme may have been established to bridge a gap in knowledge to provide data for conservation activities (see section 4.5).

4.2   Details about the scheme, group or project's activities

Is your scheme, group or project currently actively carrying out biological recording in Scotland?

Six of the 48 respondents (12.5%) were not currently actively recording in Scotland. Of these three were local projects not currently collecting data, two were replies from local schemes in England and one was from a UK-wide scheme with no active volunteers in Scotland.

What timescale is your scheme, group or project working over?

Only four respondents listed time restricted recording with a specific end date. Most replied that projects were ongoing and had no end date. Although some schemes were ongoing they did have specific targets to produce reports or atlases in particular years and some also run time-specific projects.

How many volunteers participate in biological recording linked to your scheme, group or project annually?

Four respondents skipped this question and two answered zero. Three respondents gave ranges, for the purpose of analysis the top end of these ranges were taken

Figure 15   The number of schemes, groups or projects (x axis) providing opportunities for differing numbers of volunteers (shown in bands on the y axis)
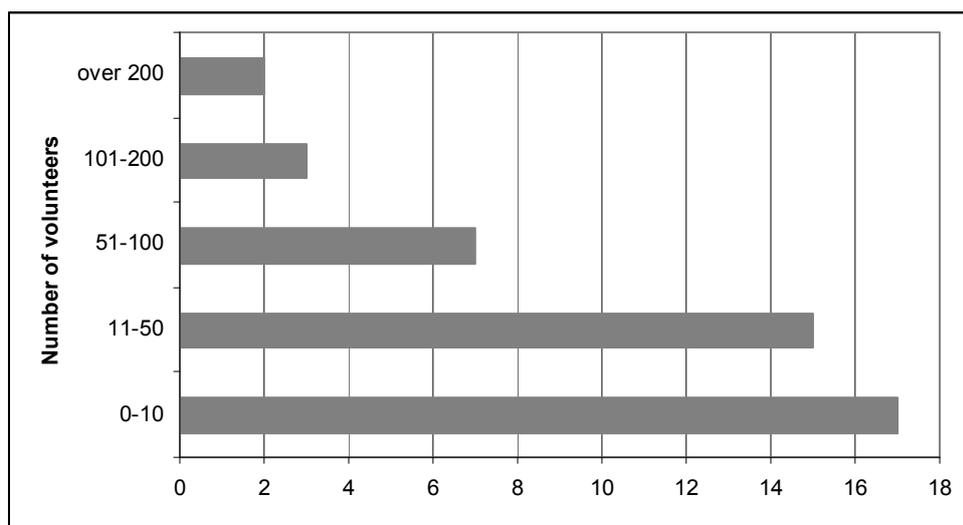
Of the two schemes reporting exceptionally large numbers of volunteers, one (with 400 volunteers) is a UK-wide recording scheme and the other (with 500 volunteers) engages the public in reporting sightings.

What is the total number of records generated each year?

Six respondents skipped this question and one answered zero. Three respondents gave ranges, for the purpose of analysis the top end of these ranges were taken.

Figure 16 The number of schemes, groups or projects (x axis) collecting differing numbers of records (shown in bands on the y axis)
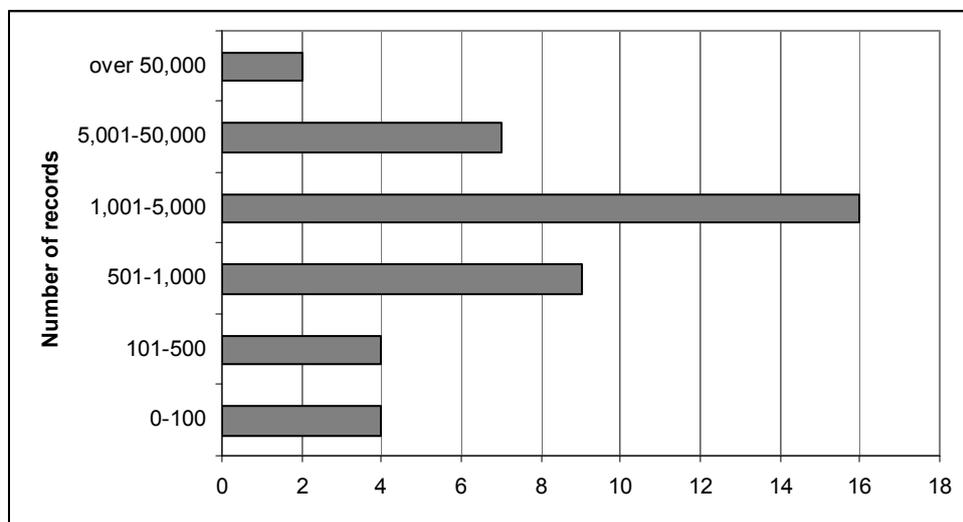
The two schemes reporting over 50,000 records annually were the BSBI for Scotland and the Scottish Borders branch of SOC.

4.3   Working with volunteers

Which of these services do you provide for volunteers and which would you like to offer?

The services that most schemes, groups or projects would like to offer (but aren't already) were accreditation of recorders (18.75%), web based discussion forums (21%) and training (21%). With the exception of training, these are amongst the services which fewest schemes currently provide.

Figure 17   The number of schemes, groups or projects (x axis) providing, or wishing to provide, various specified services (y axis)
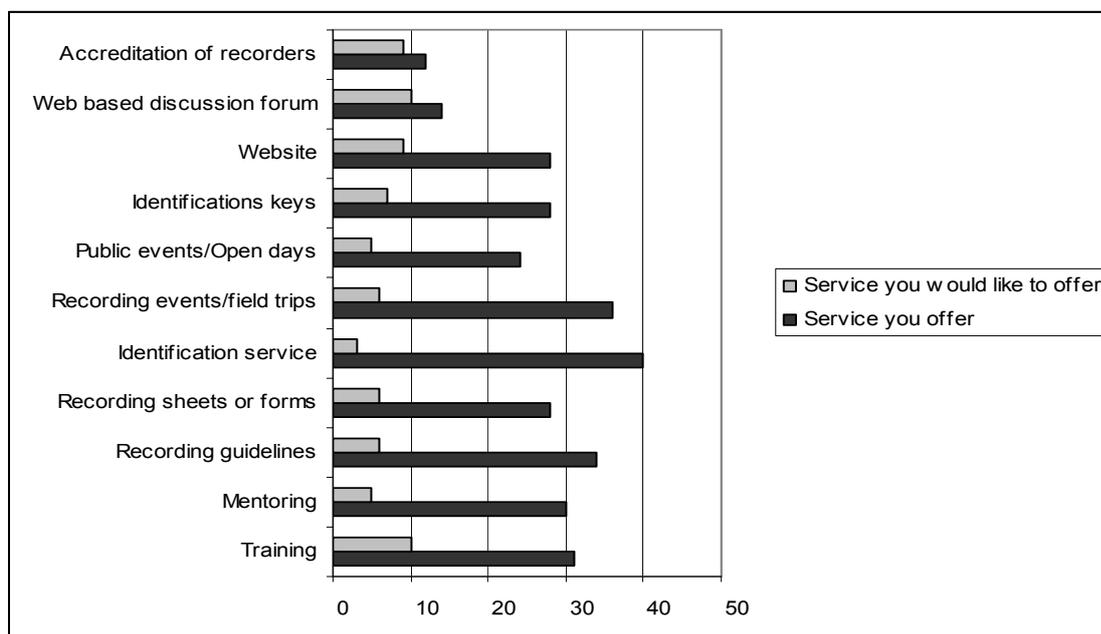
The services that most respondents already provided or wanted to provide were: provision of identification services (90%); recording events / field trips (87.5%); training (85%); and, recording guidelines (83%).

Does the current volunteer recording effort meet your scheme, group or project's objectives?

This was a mandatory question and needs to be considered in conjunction with the following questions which looked at whether the volunteer input was successful or not.

Table 4   Proportion of schemes where volunteer recording effort meets needs

	responses	%
Yes	13	27
No	6	12.5
Partly	29	60.5

What are the successes or shortcomings of the volunteer recording effort in contributing to your objectives?

Each subject was mandatory, but respondents were able to reply 'not relevant'.

Table 5   Successes or shortcomings of volunteer recording effort

	Inadequate	**Poor**	**Average**	**Fair**	**Good**	**Not relevant**
Number of volunteers	6	12	16	7	4	3
Taxonomic coverage	1	0	6	9	30	2
Geographic coverage	5	7	13	11	8	4
Data quality	1	2	6	13	21	5

Figure 18 Successes and shortcoming of volunteer effort
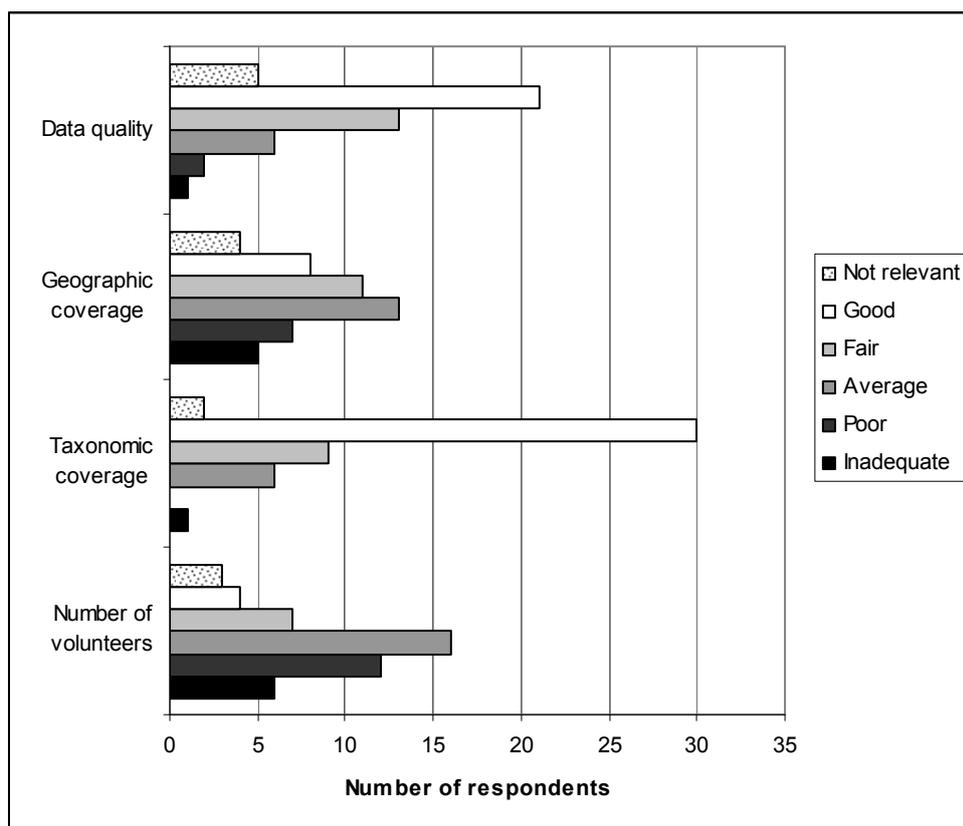
The proportion of the 48 respondents who felt that volunteer effort was 'fair' or 'good' was very high for both taxonomic coverage (71%) and data quality (81%) showing that project, scheme and group coordinators are satisfied with volunteer input in terms of the quality of data and the range of taxonomic skills. However, the number of respondents who categorised volunteer effort as 'fair' or 'good' was low for geographic coverage (40%) and very low for the number of volunteers (23%).

This suggests that the spread of volunteer skills is good but there are problems with the overall number of volunteers involved in biological recording and that there are problems with the availability of volunteers in some localities.

4.4 Recruiting new volunteers

Do you try to recruit new volunteer recorders?

This was a mandatory question.

Table 6 Respondents recruiting new volunteer recorders

	responses	%
Yes	33	69
No	1	2
Not actively	14	29

Which techniques do you use to recruit new volunteers and which do you think might be useful techniques?

Table 7   Techniques used to recruit volunteers

	Already Use		Might use		Not relevant	
from wider membership	38	84%	4	9%	3	7%
Public events	24	60%	9	23%	7	18%
targeted one to one recruitment	33	72%	12	26%	1	2%
through existing participants	21	51%	11	27%	9	22%
by providing information for beginners	35	76%	8	17%	3	7%
website pages	22	55%	14	35%	4	10%
training for beginners	21	51%	14	34%	6	15%
from members of other schemes	22	52%	13	31%	7	17%

The percentages given are of the number of respondents who responded to each subject area not the total number of respondents to the survey.

Three techniques were used most frequently.   These were recruiting from the wider membership (84%), targeted one-to-one recruitment (72%) and by providing information for beginners (76%).

There was however a reasonable spread amongst all the proposed techniques currently used.

Figure 19 Techniques used for recruiting volunteers
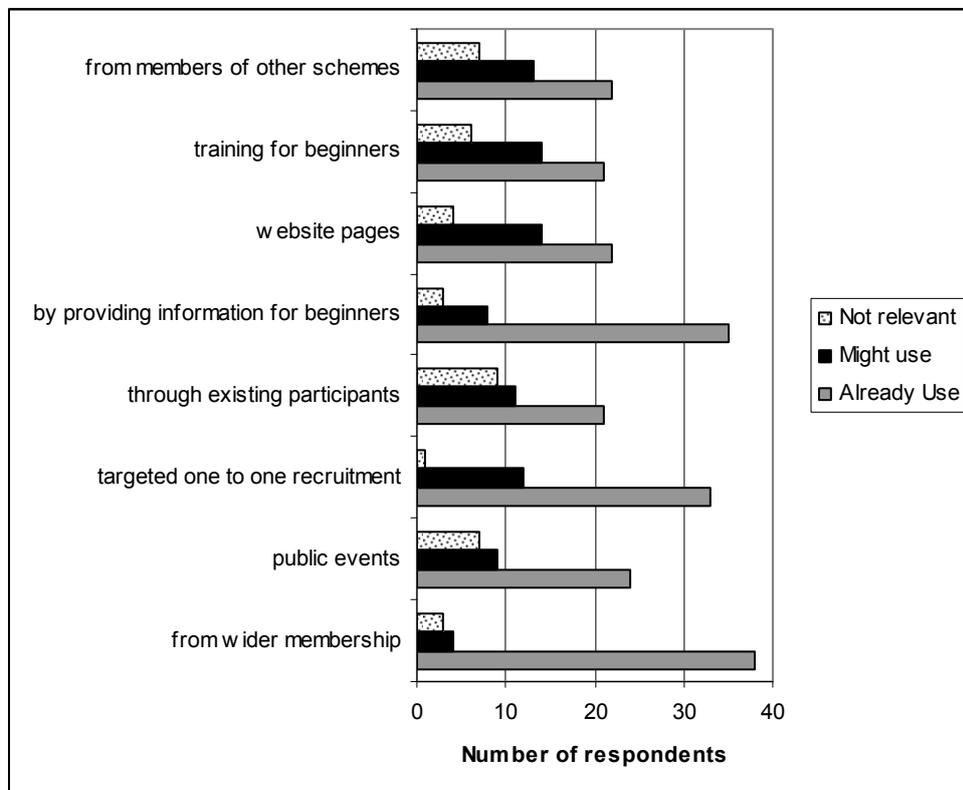
There were no clear favourites amongst the techniques that coordinators thought might be useful. Recruitment from the wider membership was considered to have the lowest potential

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(9%) but this was already the most widely used technique and therefore this response is to be expected.

The techniques where it is considered that there is the largest potential for an increase in use are website pages, training for beginners and recruitment from members of other schemes.

4.5 Data

Who do you pass/have you passed data to?

Several of the respondents who used 'other' as a category then gave one of the listed categories; for the purposes of interpreting the data these responses were re-categorised.

Figure 20 Other bodies that data are passed to
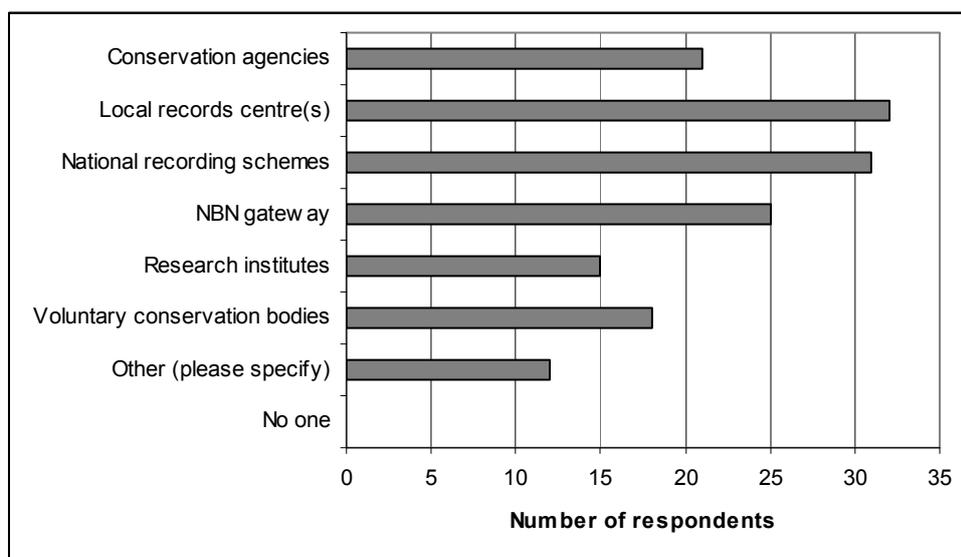
The bodies that data were most frequently passed to were local records centres (65%) and national recording schemes (62.5%). No respondent replied that data were passed to no one, although one respondent selected only 'other' and noted that "data are only passed out on a need to know basis".

Some of these data will be the same data being sent to more than one body. It is notable that the three 'bodies' data were most frequently passed to aren't users of data *per se* but data custodians who will hold data and make it available to third parties. Therefore the end users (voluntary bodies, conservation agencies etc) may be underestimated in these results as they will receive data indirectly from recording project and schemes.

Examples of the responses given in the 'other' category.

> *Data is only passed out on a need to know basis*
> *Planning authorities*
> *Local Council; appropriate landowners*
> *The group is the national recording scheme, but it is too early days to pass data elsewhere as the database is recently established*
> *As requested, but the main data is and will be through the NBN gateway*

Is your scheme, group or project specifically designed to meet the needs of any other organisations?

Thirty three respondents answered this question, 15 skipped it. Of those responding 12 replied 'no'. Six responded that they were part of a system set up to meet the needs of a national scheme or society (many being the local/vice-county recorder for this scheme). Four had specific links to providing data for local authorities and five referred to meeting data

needs of statutory conservation bodies, with particular reference to data for BAPs. Five respondents specifically provided data for other national schemes that they were not part of.

It is clear that of these schemes only a small number are designed and run to meet the needs of specific users (19% of total respondents to this survey). However, this is not to say that data from many of the schemes, groups or projects are not providing data to various users through data custodians.

Are there any gaps in the data coverage generated by your scheme, group or project?

This was a free text question allowing scheme, group or project coordinators to describe the problems they have in data coverage. Five respondents skipped this question.

Of the 43 who answered one replied that there were no gaps. The two most commonly cited problems with data coverage were taxonomic coverage (lack of people with relevant skills) with 20 respondents and geographic coverage (localities not covered mainly due to lack of recorders) with 29 respondents. Four respondents were unclear about the specific gaps, two noted that there were gaps in marine data and five noted a 'lack of volunteers' as causing gaps in coverage. Eight respondents reported that data were limited to sites, rather than covering the wider countryside.

Examples of the responses received:

> *Current recording activity is higher now than in any other historic period, but there are still geographic gaps.*
>
> *Data coverage is sparse for many areas. In particular it is sparse for Scotland and Wales.*
>
> *Much of the data is from ad-hoc site visits, few surveys have aimed to be either comprehensive at one point in time or to monitor a single species or group over time. We do what we can - we wouldn't have time to do more! Although someone to teach us about other groups (e.g. some invertebrates, fungi) would be good.*
>
> *Gaps in various taxa expertise.*
>
> *Lots of gaps! These are geographic, temporal and taxonomic. It's the result of covering a group of very poorly known insects.*
>
> *Recording generally takes place on sites that are convenient to individual recorders. I'd like more targeted recording to cover at least every 10k square in the county.*
>
> *As with recording any taxonomic group in the Highlands, there are geographical gaps in the more sparsely-populated and remote areas.*
>
> *Geographic purely because there are so few recorders.*

4.6   And finally…

Are there any improvements or expansions that would help your scheme, group or project to achieve its objectives?

Respondents were asked to list up to three improvements or expansions that would help their scheme, group or project to achieve its objectives. A total of 77 items were listed from 39 respondents (nine skipped this question). These responses were assigned to one of 11 categories for the purposes of identifying particular themes.

However, it is unclear if respondents have actually considered the 'objectives', which makes their responses read as potentially self-serving.

Figure 21 Categories of improvements / expansions that would help respondents
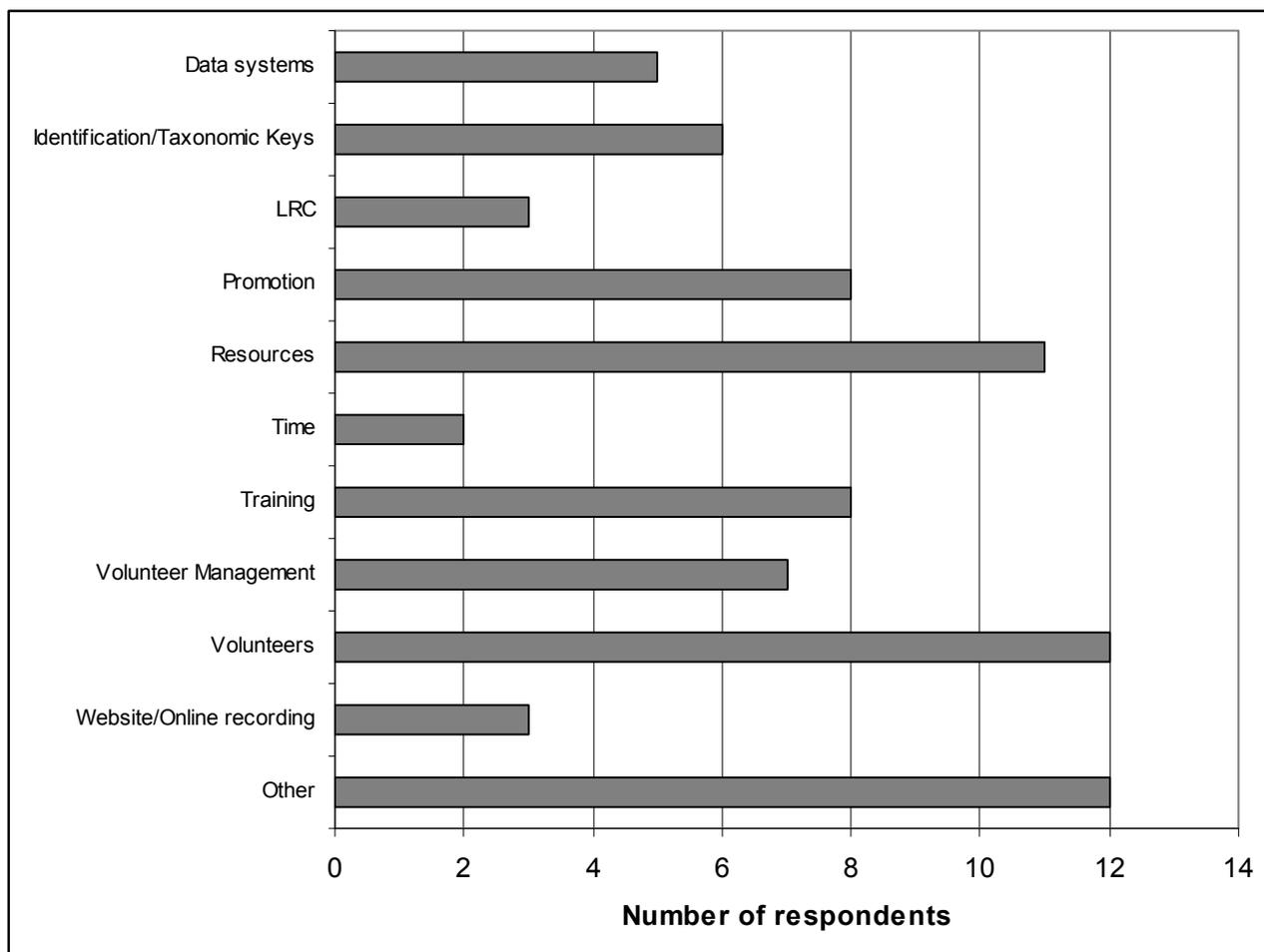
Examples of the responses received in each category:

Data systems

Closer liaison with other recording societies with formal data exchange agreements

More accessible and intuitive standard biological recording software with suitable live links to ArcGIS.

Identification/Taxonomic Keys

I would quite like a web based ID key similar to that for the psocoptera recording scheme.

Access to keys and other identification material.

LRC

If we had some sort of LRC in Highland which could act as a focus and resource-centre for volunteer development, we could do more training, loan out equipment etc.

Promotion

Targeted advertising to people who already do other wildlife surveys.

Increased membership

Resources

Obtaining equipment (e.g. longworth traps)

Financial input to employ short term people to source old herbarium records

Access to funds for the bits which volunteers aren't so keen to do (like data inputting) would help!

Time

More time, especially for newly recruited volunteer recorders

Training

More free training available - for both volunteers and project leaders to take back to volunteers
More training in species identification (the less recorded taxonomic groups)
Greater technical competency

Volunteer Management

Additional staff in order to better mobilise volunteer recording effort.
Greater resources (money) to provide staff to do further co-ordination of volunteers

Volunteers

More volunteers in heavily subscribed regions.
Getting more people interested (we are rushed off our feet.....)

Website/Online recording

Online recording (using Indicia)
Website

Other

More contact with SWT Lothian branch might be very useful since we share similar aims
Increased emphasis on recording techniques and purposes in Primary School curriculum

Do you have any other comments that might help us with our research?

Twenty-three respondents answered this question – two to reply that they had no additional comments.

The responses cannot easily be categorised but did provide a number of valuable insights, which have been integrated within the findings of this research.

Examples of the comments received:

An unexpectedly productive source of volunteers was macrophotographers (on FlickR) who are keen to know the names of species they photograph. They can often be directed to carry out specific searches.

Apart from the major recording organisation most of the rest would produce more data if they could be encouraged, organised and trained more. We believe that there are many more people who would become contributing recorders if there was a more structured support system for them to use where they could get the necessary guidance, technical help and relevant feedback.

I don't think biological recording is something that really interests the general public, it's rare that someone will give up their spare time to do this as recording at a useful level requires a fair commitment to learning ID skills and processing data. We did run training days on common insect groups but no one submitted any records despite good attendance on the training days. Now have some more training event in Inverclyde thanks to BTCV but I will be surprised if any records come in after. I think the average person would rather go down the pub.

Records from specialist organisations handling only certain taxonomic groups should be channelled into regional Local Record Centres more effectively. This essential flow of information should be promoted by all organisations gathering records, LRCs, and their funders. Otherwise only a fraction of the value in the volunteer recording effort will be realised. Decision makers can't talk to hundreds of different organisations, they need a 'one stop shop' that allows them to put all available records in context with the decision they need to make. At present only LRCs are in a position to do this.

Taxonomic expertise in this group is at a crisis, volunteers participating in this group could not identify specimens without this support.

We have particular problems in Highland because of the small human population, large area and lots of biodiversity. The many recording groups/schemes which operate nationally and locally are largely drawing on the same limited pool of people here. There is a danger of volunteer fatigue/burn-out.

We the willing, led by the unknowing are doing the impossible for the ungrateful. We have done so much with so little for so long, we are now qualified to do anything with nothing.

5 FINDINGS OF TELEPHONE INTERVIEWS

5.1 Interviewees

To supplement the desk studies 54 people were interviewed on the telephone. The individuals concerned were selected because they could provide information on one, or more, of the following subject areas i.e. they were:

- Directly responsible for running a national scheme and were therefore able to provide details of the scheme including the thinking behind it and what the scheme involved, and whether or not there were any available results relevant to this study.
- Representative of a type of local scheme (e.g. natural history societies) for which information about their biological recording activities was difficult to find.
- Providing a sample of a specific biological recording roles (e.g. vice county recorders) to clarify how that role functions.
- A known biological recording enthusiast whose experience of working as, and or with, volunteers could inform the study.
- An SNH member of the project steering group or project advisory group.

The telephone interviews were biased towards people who were primarily involved in obtaining or using high quality biological information, although a number of organisations involved solely with the public or with beginners in recording were also contacted.

5.2 Findings

The 18 hours of discussion covered a huge range of subjects, details of schemes and personal anecdotes. The key points have been fed through into the findings but across the interviewees there were a number of common themes.

5.2.1 The relationship between professionals and volunteer recorders

Staff from the voluntary organisations interviewed were all aware that the volunteers were ultimately in charge of the organisation itself even if much of the 'work' was now being done by professionals. However, both professionals and volunteers acknowledged that having staff to help get the best from the volunteers has proved very valuable. Keeping volunteers motivated and organised is both difficult to do and time consuming. It requires developing personal relationships between the staff and the volunteer and its success is often very dependant on the personality of the staff involved.

5.2.2 The scale of recording in Scotland

Many interviewees pointed out the obvious that Scotland is a big place and there is a huge amount of work involved in biological recording to provide accurate, up to date data covering the full range of biodiversity. Specific examples given included the problems of actually processing data, keeping long-term records, designing schemes to appeal to recorders, training people to carry out the recording and obtaining the finances to work with volunteers. There was also concern about the number of relatively short term (i.e. three years or less) projects which made it difficult to both develop the project and keep it going long enough to become productive.

5.2.3 The need for good quality biological data

A few of the interviewees referred to the fact that good data are required for good conservation decision making; all data in this category require an effective verification process and to obtain such quality data needs people who know what they are doing. The consequence of this analysis is that a lot of effort and care is required to ensure that there are enough expert volunteers to supply these data.

5.2.4 Motivating volunteers.

Most people recognised that motivation was key to biological recording. Obviously the nature of the work that recorders are asked to do is fundamental but good feedback to the recorder is fundamental to ensuring individuals both give their best and continue to record. The personality of staff has been identified as very important to this process. The underlying objective was summarised by one interviewee as "motivating people to become self-motivated".

5.2.5 Training volunteers

Many interviewees pointed out that there were relatively few competent people available in Scotland, especially in the more remote parts. However, for some species groups there were no experts regionally or even for the whole of the country. There was general concern at the impact the loss of the few existing experts would have when they retire or move away. It was accepted that there was a shortage of new recorders in almost every species group. Training, including the process of mentoring, is regarded as key. Local experts do help out with training and there are a few external trainers who can be called upon but generally training is time consuming and expensive to organise. There is very little evidence of the cost effectiveness of training (for example how many useable records a trainee goes on to produce). This is particularly the case with beginners training courses in recording run as part of the recruitment process.

The National Trust for Scotland does recruit volunteers to help its staff undertake ecological work including survey and monitoring. They provide volunteers with a 'job description' and interview them for the post; the principle behind this approach is to demonstrate how valuable these volunteers are to the organisation and the 'status' they will have once appointed.

5.2.6 The facts about biological recording in Scotland

It proved difficult to gather many facts from the telephone interviews about the scale of biological recording, the effectiveness of the various recording schemes or the success of training programmes. According to the interviewees some further information would be available for extraction from their records but others pointed out that for some key projects the necessary data were not collected at the time. In particular there seemed to be no data on the success of the long-term development of an individual as they moved through the training process from beginner to expert.

6 DISCUSSION

This section brings together findings from the literature search, the telephone interviews, the survey of scheme, group and project coordinators, the survey of individual volunteers and the workshop to discuss the key findings and the issues facing volunteers and organisations. The section is structured primarily under the critical stages used in recruiting, developing and supporting volunteers in biological recording.

6.1 Five steps in the development of volunteer biological recorders

A series of 'stages' in the process of producing effective recorders has been identified. These 'five steps' describe the process of volunteer development in the field of biological recording. To encourage skilled volunteer recorders, individuals must be guided successfully along this path.

It is reasonable to assume, given the size of the population of Scotland, that there are a number of potential recorders who could be added to the total number of active recorders. As about half of adults in the UK volunteer in some way (Cabinet Office, 2008) there is a large pool of people from which new recorders might be drawn. However, it also self-evident that the number recruited initially will decrease as the potential recorders move through the system with only a few will become experts.

Any individual may choose to stop anywhere along the progression, feeling that they have reached where they wanted to go and not wishing to develop their recording skills any further. Obviously any involvement with recording must be seen as worthwhile but once someone 'becomes' a recorder they retain that interest (although not necessarily the practice) for the rest of their life. The steps in the process are:

- Developing interest and recruiting recorders
- Developing skills
- Moving from beginner to competent recorder
- Moving from competent to expert
- Engaging in other types of recording

6.2 Developing interest and recruiting recorders

It is accepted that huge numbers of people have a general interest in wildlife and the viewing figures for some of the major wildlife programmes on television demonstrate that. However, far fewer people take their interest into the field and actually get involved directly. Nevertheless, many of the large numbers of people who do get enjoyment from the outdoors must have some sort of interest in wildlife and it is only a short step to record it in some way.

According to a report from the NBN Trust (2007) many of the national recording schemes have grown from a group of like-minded people with an interest in a particular taxonomic group, enjoying studying them purely as a recreational pursuit. However, there are also recruitment issues for any scheme including that the age of existing recorders can be a social barrier to younger ones joining; the lack of engagement of the general public with the natural world and the lack of teaching of 'whole organism' biology in schools and universities.

6.2.1 What triggers an interest in recording?

Obviously any recorder's contribution must start somewhere. The key to increasing the number of recorders must be to identify what it is that triggers off an interest in recording wildlife in the first place. Our survey made it clear that 30% of current recorders had an interest in wildlife since childhood and a further 26% expressed the trigger to be their general interest in natural history and the countryside. A small percentage began their interest later in life as a student and slightly more identified a specific person who had inspired them to

have an involvement in recording. Others could link the beginning of their interest to a specific experience such as becoming involved with a local records centre, joining a club or natural history society, being a countryside ranger or just going on a field outing looking at plants, badgers or butterflies. Only a few people have taken up recording specifically because of their concern at what was happening to wildlife.

6.2.2 Developing the interest

Initiatives to encourage involvement with wildlife include many aimed at children, such as the 22 'Wildlife Watch' clubs run by the Scottish Wildlife Trust and their Spotting Sheets. Some experienced recorders believe that a lot more should be done directly with schools, for example through recorders giving talks on wildlife.

There are opportunities for people to engage first in their local area before becoming involved in biological recording more generally. The BBC Breathing Places, established in 2005, encourages everyone to do one thing for nature in their local area. Working with a diverse range of partners Breathing Places promotes opportunities, events and places for people to go out and get involved in their local wildlife. Currently this includes promotion of a number of national surveys as well as local recording events.

6.2.3 Recruitment

There will always be a need to recruit new volunteers to engage in biological recording whether these are raw recruits or individuals who already have some expertise and can be engaged in a new field. This may mean recruiting people with a particular skill, available at particular times of the year or in a specific geographic location. New volunteers are always needed as there will inevitably be volunteers who stop recording. Examples of reason why people stop recording are because they develop new interests, move to another area or lose interest.

6.2.4 Mechanisms for recruitment

In our survey of schemes, groups and projects three techniques were used most frequently to recruit recorders. These were recruiting from the wider membership (84%), targeted one-to-one recruitment (72%) and providing information for beginners (76%). It was clear from our telephone interviews that recruitment of new volunteers is often unstructured and that follow up of public events is often poor, relying on potential volunteers to come forward and offer their time.

It is important to make the progression from a general interest in natural history or wildlife to becoming involved in biological recording a simple process. This means making information on recording activities and training opportunities widely available to the right audiences, and wherever possible providing direct encouragement. Personal invitations (preferably face to face or by telephone) to people who have shown some interest, perhaps by attending a public event on a subject, are very effective. This is the first stage of engaging people and making them feel part of a network. One respondent to the individual volunteer survey said "*Very keen to undertake more survey work, but don't know how to find out where such voluntary activities happen*"

6.2.5 Popular surveys to get people involved

A lot of effort has been put into encouraging the general public to take an interest in wildlife and recording. Popular surveys have always been effective, for example postcard surveys using easily identified species (e.g. for the orange tip butterfly by Butterfly Conservation or 'have you seen a lapwing' by RSPB). All countryside rangers are involved in environmental education (see SCRA website) and many of the 154 ranger services in Scotland, as well as some nature reserve wardens, organise wildlife walks which frequently encourage participants to become involved in local recording (SCRA, 2008).

Giving the public a first taste of recording was taken up by Biological Recording in Scotland (BRISC) through their 'Wildlife Counts' project. This ran for two years and introduced biological recording to a wide range of people in three local authority areas in Scotland. This pioneering project showed that recording could be a good way of getting people engaged with their local environment. However, learning about wildlife and recording is a long-term process and relies on good feedback from the users of records explaining what the records are being used for. There is also the obvious point that new recorders, with experience and training, can become trainers themselves and start other people recording.

Recently the idea of 24 hour recording events on a specific site to which the public are invited to watch or participate has caught on. This has been based on the American BioBlitz idea developed by the U.S. National Park Service, National Geographic, and the American Association for the Advancement of Science. Such events, led by BRISC through their Wildlife Counts project, can produce dramatic lists of species but require a great deal of organisation, many willing experts and a lot of follow up. It is thought by some people that many BioBlitz events are too superficial and produce lists of common and widespread species with many errors in identification. Such results could give a misleading idea of the biodiversity of the area and also perpetuate poor recording.

The UK Phenology Network, run jointly by The Woodland Trust and the Centre for Ecology & Hydrology, enourages members of the public to record individual species, selected across a wide range of groups and also "events" (such as the first leaves emerging from buds) that mark the onset of changes in seasons. Running for over a decade contributors can now enter their results online. The network has also linked in with the BBC's Springwatch and Autumnwatch television programmes to increase the number of people reporting signs of changing seasons.

Using modern technology the RSPB has developed the Big Garden Birdwatch encouraging anyone to do a simple winter survey of common garden birds then entering their results through the web. This process also has the advantage of the RSPB being able to keep in touch with those who have made this effort. The very similar scheme run throughout the year, the Garden BirdWatch organised by the BTO, has been running for 15 years and about 500 records are submitted each week from recorders in Scotland. Interestingly the percentage of online submissions of records across the UK has risen steadily from 20% in 2003 to 50% in 2009.

6.2.6 Involving specific groups of people in recording

There are, of course, many people such as farmers, foresters, fishermen, and gamekeepers etc. who already have a considerable interest and involvement in the countryside and wildlife and are in a position to use their existing skills to do some wildlife recording. There are several current initiatives which have explored this concept including the Riverfly Partnership Monitoring Initiative which has encouraged and trained fishermen to identify and record mayflies, stoneflies and caddisflies. A more extensive project is the Building Bird Monitoring in Scotland project run by the BTO to encourage specific groups such as hill walkers and game keepers to record birds particularly land managers and land owners through encouragement (Bird Survey Taster Days) and training courses. A report on this pilot project is expected in 2010.

In the sea, recording is far more difficult than on land but sea fishermen have been encouraged by Glasgow Museum to help research into threatened fish species by tagging any skate they catch. In a similar way cetaceans are recorded by yachtsmen encouraged by the Sea Watch Foundation. Particularly effective has been the participation by amateur divers in recording undersea wildlife through Seasearch run by the Marine Conservation Society. By providing good training, a structured entry to the project and simple identification guides and recording forms, significant data on both habitats and species have been obtained, often by divers who would otherwise have little to do with the natural world. Similarly divers have been very valuable in taking photos and videos that can then be

identified by experts at a later date. This makes good use of volunteer time without requiring specialist ID skills and allows far wider geographical and taxonomic survey coverage (English Nature, 2003).

An example of a project developing links with groups involved with nature (but not with biological recording) is the Open Air Laboratories Network (OPAL) which involves approaches to relevant community groups in England and Wales such as allotment holders, schools and organic gardeners. Regional staff members visit and train these local groups in how to carry out surveys (e.g. of earthworms), who then supply data to the survey. As key success factor here is getting an authoritative "scientist" to train community groups.

Many university students of ecology, biology and countryside management courses receive little, if any, field work as part of their studies. What could be seen as a lack of interest in field work amongst these students is more commonly a lack of opportunity. This sector rarely knows about what projects and opportunities there are to engage in biological recording at a local level. Developing links with relevant student bodies or lecturers can provide a fruitful source of volunteers, many of whom will see opportunities for volunteering as part of their career development.

These techniques appear to be quite effective providing they are carefully thought out, take into account the needs, skill levels and activities of these pre-existing interest groups and sectors, and sufficient support and follow up is provided.

6.3 Developing Skills

6.3.1 Training

Thirty two per cent of respondents to our on-line survey of individuals identified 'opportunities for training' as the most likely action to encourage them to do more recording. Obviously this third of respondents may be those people who are still learning about wildlife and developing their survey skills and will naturally want to know more through training. However, there may well be many others who could benefit from training but still need to be convinced that it applies to them. In reality many recorders are highly motivated self-taught people who have learnt by doing and by mixing with others who know. For others, training could speed up this process and give them the confidence to become more self-sufficient.

Training is valuable at all stages in a recorder's development. It can be simple training courses that first introduce a person to the field of biological recording. Similarly, experienced recorders can benefit from training in specialist skills, using new equipment etc.

Local initiatives to encourage beginners to become more competent include ones such as the 'Species of the Month' surveys run by the Highland Biological Recorders Group (HBRG) which picks out one distinctive and easily identified species whose distribution is poorly known and asks volunteers to check locally if it exists. The Boleskine Environmental Network initiated a two year programme of training. It developed recording schemes (Boleskine Environmental Network, 2007) specifically in response to the key findings from a consultation carried out by the Inverness and Nairn LBAP which uncovered a lack of awareness about local biodiversity and a lack of information on specific groups of plants and animals. The project wanted to engage people in recording, provide them with training and ensure that they knew what records to make and where to send them. What wasn't anticipated was how quickly people would start recording and that in the short (two year) life of the project significant recording work was started on breeding birds, butterflies, moths and red squirrels. Several recorders are now operating in their own right as a result of the project and it is anticipated that their interest may spread to other groups and to engaging others in recording.

Some countryside ranger services (such as the City of Edinburgh and the Pentland Hills Regional Park) have set up their own biodiversity group of volunteers who get training in a

wide range of general recording skills, identification skills and basic understanding of biology and ecology before doing recording for a specific purpose.

The Field Studies Council (FSC) has for decades run residential courses led by experts e.g. the forty courses covering a very wide range of natural history subjects run at the Kindrogan Centre, Perthshire in 2010. These can result in individuals being inspired, gaining technical know-how and developing their skills further. Interestingly one of the most requested training course in Scotland is for the use of technology (e.g. GPS, recording software) for recording (Martyn Jamieson personal communication).

The Field Studies Council have experimented with providing structured training for recorders through their Biodiversity Training Project where, over a period of five years, people in Shropshire have been offered a range of expert-led training courses to improve their skills and abilities. This five year long project, made up of a series of courses on a number of subjects and aimed at various levels of expertise, was provided free to anyone who wanted to take part. Some 700 people took part with 15 to 20% new people recruited each year. Everyone who took part was encouraged to join the relevant specialist society and to provide their records to the local records centre. A considerable amount of effort was put into training in field studies and the technical aspects of recording.

There are resources barriers to training including the cost of the staff involved in preparing, developing and delivering courses, travel costs and venue and equipment costs. Consideration also needs to be given to the ability of trainees to attend training events and to pay for them if a charge is levied. However the Tracking Mammals Partnership and NBN (2005) found that "there is some evidence that volunteers may value training courses that they have paid for more than courses that are provided free of charge, particularly if they receive some sort of certification at the end of the course".

Training does require trainers and the question of finding people willing, and able, to do training in specialist fields of identification, surveying and recording is a key one. Generally speaking experts are keen to pass on their skills and knowledge to others;*"(training) is all great fun and I am happy to put in as much as I have taken out of biological recording – in recognition of all the help I have had from others over the years" (*Mike Davidson, personal communication). The same trainer points out that access to microscopes, identification guides, the internet and recording software as well as to travel costs are all material factors in individuals being in a position to undertake training, and that LRCs could be key to solving some of these problems.

Face to face training is generally considered to be the most effective method. The report from the Tracking Mammals Partnership and NBN (2005) identified training as essential both in raising awareness of conservation and wildlife issues, and in creating enthusiasm among volunteers. It noted that "training courses provide a way of meeting and interacting with others who have similar interests and may give a sense of belonging to a particular group. Training also helps to broaden experience and can be very enjoyable."

Although much can be achieved by providing training on-line and in the form of information packs there is a lot to be gained form face to face training. The report also points out "The advantages of this type of training are that the trainer is able to convey enthusiasm and that there is two-way communication and personal connection. It allows for practical demonstrations and hands-on practice on the part of the volunteer, with instant feedback. It is a very effective way of learning and has a very high rate of volunteer retention."

6.4   Moving from competent to expert

6.4.1 Development programmes

The whole recording network depends on a relatively small number of experts whose knowledge and hard work frequently sets the scene for competent recorders to focus their contributions effectively. They also act as arbiters of difficult identifications and many

provide information such as checklists which help other recorders considerably. However, it takes a long time to become an expert and in Scotland not only do we have low numbers of experts (in some cases no experts!) but many of them are elderly and no obvious successors are available. Getting to be an expert is a gradual process involving not only actually learning about the subject and gaining lots of experience but also establishing a reputation of being reliable and accurate.

The lack of experts is a problem that has been widely recognised throughout the UK and has been attributed to the reduction of the taxonomy teaching and research done in our universities and research institutions. This was the case for lichen recording in Scotland and Brian and Sandy Coppins, the recognised experts in the field, devised an apprenticeship scheme where they mentored a few keen people in the field and in the lab to become competent recorders and, it was hoped, eventually experts. This idea was taken up by BTCV Scotland through their "Natural Talent" scheme in which a few people each year are paid a living wage while being mentored and taking part in suitable field work to become competent or very competent recorders. Clearly this is a valuable way to speed up the process of producing experts, and by being proactive it may well make up the numbers of Scottish based recording experts.

6.4.2 Mentoring

Mentoring has traditionally been the way in which people have developed their skills in recording. Simply by going out with an experienced and competent recorder a beginner can learn the relevant field craft, identification skills, and the regime of record collecting and recording. In this way knowledge gained over decades is passed on in an efficient and natural way. However, this often long process is perhaps less appropriate if people wish to learn and develop skills rapidly. There is also the problem that many senior recorders want to record rather than spend time passing on their skills!

There is no doubt that learning 'alongside' an expert is a very effective way to develop good skills in almost every subject area. The most structured way this is applied is amongst bird recorders where such skills as bird ringing require close supervision. This is done through a learner working under a trainer who is an experienced ringer and a member of the British Trust for Ornithology (BTO). Once skills have been learnt to the trainer's satisfaction the would-be ringer can apply for a license to undertake ringing unsupervised.

The BTCV Natural Talent training relies almost entirely on the process of mentoring. When this scheme was being devised many experts, both professional and voluntary, were asked if they were prepared to mentor competent 'apprentices' who wanted to learn from them. Everyone who was approached agreed in principle to be involved possibly because they were all passionate about their subject and realised that there were few people (at least in Scotland) who could continue their particular interest.

6.4.3 Motivating volunteer recorders

Even when individuals have undertaken biological recording to some extent they still need to be motivated to continue being involved and to develop their level of skills. Our survey looked at the motivations of recorders (section 3 Figure 7) which were, understandably, complex and involved several aspects. However, most thought that they were contributing to wildlife conservation and almost as many were either driven by the idea that they were gaining further knowledge of the subject, or that they were contributing to research. High numbers were inspired by discovering more about nature and were keen to develop their recording skills. It is interesting to compare that only 35% of the schemes, groups of project had the provision of data for conservation action as part of their objectives and only 13% specifically had engaging people with biodiversity as part of their objectives. Of course this does not mean that data collected are not used for conservation or that the scheme does not recognise the requirements of individuals in how it is structured.

A significant number simply wanted the opportunities to meet like-minded people. Although we did not list it in our choices, 9% pointed out that they did recording because it was fun, they enjoyed it or it even gave them 'a buzz'. Many of the people interviewed also made the point that they only did recording because they enjoyed it and one person pointed out that he would take up another interest if he became bored with what he was doing.

6.4.4 Support for identification

Identification of species can be a major obstacle to getting more people involved in recording and ensuring that accurate and reliable data are produced. In the survey of individual volunteers when asked what would encourage them to do more recording 20% of respondents suggested access to better identification keys and 29% someone to help with identification. Clearly this is a significant issue in terms of enabling volunteers to record.

Almost every scheme has developed ways of helping its participants with identification which at least involves recommending the appropriate identification books. It is a basic requirement that all volunteers have access to the relevant keys, and know which keys/identification guides they should be using. For schemes focussing on single or small numbers of species special identification guides can be produced and made widely available.

Clearly there is a key role for both training and mentoring in terms of developing an individual volunteer's identification skills. It is important to recognise that developing high level of skills in many groups takes a long time and a lot of practice. Wherever possible this means either field work alongside other competent recorders or direct support in identifying specimens. For many volunteers it is important to combine the building of identification skills with developing confidence.

Much of the material currently available for identification is not very user-friendly and was targeted at a scientific community. There has been very little development in the approach to writing and presenting keys over the last century. There have been a few breakthroughs in botany, writing keys so that species could be identified when they weren't in flower, and with birds, where material (photographs) of species in silhouette, flight, different plumages etc. New and innovative ways are needed to help people distinguish between species and, for many groups, new material needs to be developed upon which to base identification.

Where there are successful approaches these are generally specific web-base identification keys for example the National Barkfly Recording Scheme in which photographs of living barkflies are linked to images of microscopic preparations through a step by step key. Other schemes, for example the British Lichen Society, offer similar identification programs for use on a home computer.

The power of the web has led to many aids to identification, such as the stereo photographs of mosses and liverworts provided by the British Bryological Society to make the appreciation of structure easier. These 'image galleries' are normally based on digital photographs, supplied by recorders, and put together in a structured way to make them easy to look up and use. In some cases, such as British Lichens, the collection of photographs has been the result of one enthusiast basing a website on his photographs supplemented by some from other experts. The use of digital photography has in fact transformed biological identification in the UK, as not only is it much easier to take a photograph and check that it is good enough before leaving the specimen, but it is also easier to send the photograph to experts for identification or to fellow recorders to compare observations. For many groups the photograph is replacing the need for a voucher specimen.

An excellent example of a photographic resource is the UK Moths website which has compiled a set of photographs of almost every macro and micro moth, including photographs of the larval stages, linked to an NBN Gateway map of the species' known distribution. A simple yet flexible and foolproof search field gets you to the species concerned via scientific or common name, part name or species number (a unique code assigned to all UK species

by the National Biodiversity Network). However, not all species can be identified from photographs of the living specimen and there are other websites, for example the Lepidoptera Dissection Group website, which provide access to prepared slides of moth genitalia to allow more accurate identification.

The Scottish Moths discussion group (see reference page 53) provides an expert identification 'service' from submitted digital photographs, where other members of the group assist with identifying specimens.

Even a simple list of the species found in Britain is useful, but many websites, such as that run by the Botanical Society of the British Isles, also have regional or local checklists which not only allow the recorder to anticipate what they might find but also alert them if they find a species not yet recorded for that area. Other developments include a 'most likely to see' list for beginners and records linked to the phenology of the species, for example the website of the East of Scotland Branch of Butterfly Conservation allows recorders to check that the flight time of a moth they have identified matches previous records.

6.4.5 Accreditation of recording skills

Individuals need to know where they stand in terms of their skill level and what the next steps might be in developing their skills. This works in two ways; it ensures that people know their limitations and also helps to build their confidence. Some form of structured development scale can help encourage recorders to learn new skills. There is also value to the data managers and data users in terms of being able to assess the quality and reliability of data they receive and facilitate data verification processes. Formal accreditation systems can however be seen as a bit "Big Brother-ish" and can, if not developed very carefully, result in very complex set of mechanisms that could divert energy from recording into bureaucracy.

The BTO runs a very effective bird ringing training and accreditation scheme, where those with skills are involved in a formal assessment system – working their way up from just watching the ringing process to eventually being issued with a permit to allow them to ring birds on their own. This structured approach is needed as licenses are required to carry out bird ringing.

To help establish where a recorder is on the scale from beginner to expert the BSBI provides a simple, affordable test that determines a volunteer's identification skills through looking at a series of plant specimens and resulting in a Field Identification Skills Certificate (FISC) on a scale from 1 (beginner) to 7 (expert). According to BSBI this is becoming established as the industry standard for assessing botanical survey skills.

Other training courses do allow certification, including those run jointly by the FSC and Birmingham University's School of Biosciences which provides professional level certificates in Biological Recording and Species Identification. These also form part of the part-time, weekend based MSc in Biological Recording: Collection and Management two year course. The Natural History Museum also offers professional level Identification Qualifications via exams for a number of species groups.

6.5   Engaging in other types of recording

Competent and expert recorders are a valuable resource, not only in carrying out recording activity in their own specialist field, but also through having the potential to use their skills in other areas. Most simply this is through developing skills in other taxonomic groups, enabling a recorder to cover a wider range of groups when out recording.

However, there is a need to record biodiversity in different ways other than through routine species recording (presence or absence at a location on one date). Key areas where there are data needs include habitat recording, species monitoring (including the study of populations over a period of time) and site recording (across a range of taxonomic and habitat groups). Experience has shown that it is often difficult to engage existing skilled

recorders in these other activities particularly as it can be seen as getting volunteers to undertake other peoples' 'organisational priorities'.

The BSBI's efforts to undertake species monitoring using volunteers as part of their 'Threatened Plants' project has proved difficult to maintain. The project is by nature long term and takes recorders away from their own interests. Similar problems are associated with the site condition monitoring carried out by BSBI on SSSIs, as recorders can be reluctant to go to sites outside their own area. However, other initiatives such as the monitoring work on sites run by Plantlife through their 'Flora Guardians' scheme, the bat roost monitoring organised by the Bat Conservation Trust and the local bat groups, and the Scottish Raptor Monitoring Scheme run by the Scottish Raptor Study Groups all carry out long term monitoring which could not be done without the network of volunteers.

It has proved possible to undertake habitat surveys using skilled volunteers such as that done by the North East Scotland Biological Records Centre (NESBReC) which has volunteers who work with a professional surveyor.

Building on these experiences, better techniques and systems for expanding the activities of already expert recorders into these new types of recording could be developed for use by a wider range of groups and organisations.

6.6 Volunteer managers

Probably the most creative effort has been put into ways in which the volunteer recorder can be encouraged and helped to do their recording. Most of the major voluntary organisations involved in biological recording have invested in professional staff to support their volunteers. These staff undertake a wide range of roles in their interactions with volunteers but all help with the organisation of major meetings, training and attending key meetings with other people where volunteers cannot attend or feel they need to be supported. For example a leading, long-term recorder in the BSBI claimed that having a Scottish officer "*transformed the BSBI in Scotland*". However, the officer concerned pointed out that "*a lot of effort was needed to influence volunteers, including time consuming one to one meetings*" and even then it was 'difficult to organise volunteers too much' when it came to getting them to deliver the organisation's priorities. Because of this the larger voluntary bodies often employ project officers who can deliver specific programmes of work.

Having a "volunteer manager" is a key technique and the lack of such a post is seen as a major barrier to volunteer development. In a review of UK Local Record Centres (Natural England, 2007) 81% of the centres cited "time/staff shortage" as an obstacle to doing more for volunteers to maintain their support.

An analysis of the opportunities for environmental volunteering to deliver Scottish Government's policies (Dalgleish, 2006) concluded that "volunteer managers are critical to the whole experience of the volunteer and to the delivery of many of the potential outcomes. In the environmental field, they need to be genuine all-rounders, able to inspire and lead, possessing, in addition to their environmental skills, a wide range of people-related skills, especially in the light of more inclusive initiatives which support volunteers of different backgrounds and abilities. They need to be involved in training, mentoring, health and safety, risk assessment, and they need to have the skill to make volunteering in the environment easy and worthwhile for a diverse range of people. They need to manage projects and finances as well as the people involved and they need practical organisational skills to get jobs done, often in situations where capacity is limited. They need excellent communications skills, to deal with customers and landowners, as well as with the volunteers who, unlike most employees, always have the option of departure. In short, they need all the skills that would be expected of a manager of a paid workforce, yet resources are always tight, training is not well coordinated and there is no professional recognition for the professionalism that they bring to the job."

6.7 Local Records Centres

Local Records Centres are listed by 18% of respondents to the individual volunteer survey as a "project" that they record for; whilst other cited them as their source of inspiration "*It began when Dumfries & Galloway Environmental Resources Centre was created. Here, at last, was a means of recording odd observations that would otherwise be los*t". For those few areas of Scotland with a staffed records centre there are two key roles for them to play. The first is a one-stop-shop where records can be sent with the knowledge that they will get to the appropriate national schemes etc as well as being put to good use locally. The second is as a 'definitive' source of biological data, where information from all kinds of projects, schemes and organisations is brought together and, through digitisation, made available in a format which is relevant to the questions being asked.

It follows that existing LRCs are in an ideal position to help with the roles of bringing people interested in different forms of recording together, training and encouraging volunteers, supporting minor recording schemes locally, providing feedback on what is being discovered locally, helping with the digitisation and verification of records, advising on the prioritisation of survey effort and providing data in ways that make sense to the volunteers concerned. A review of Local Records Centres in the UK commissioned by Natural England (2007) looked at the services provided to volunteers by Centres and found that these included: provision of local contacts; training/ technical advice on recording; forums or conferences; meeting space, and use of other office facilities.

6.8 Financial support

Despite the fact that recorders are taking part in recording schemes on a voluntary basis the actual costs involved (e.g. for equipment and travel) can restrict the amount of recording an individual undertakes, or prevent others from engaging at all.

Resource considerations are important in planning any volunteer biological recording work and the costs to the individual should be kept to a minimum. Volunteers are primarily asked to give of their time and skills. Wherever possible all the resources needed by volunteers should be provided and equipment and travel costs should also be considered.

Although money is not normally available for funding volunteer expenses, specific projects do often include such expenditure as part of the budget. For example, the Highland Biological Recording Group currently offers its members reimbursement of personal expenses for targeted volunteer recording. The Scottish Bat Officer of the Bat Conservation Trust believes that providing bat detectors to potential recorders is essential to get them properly involved, and the BSBI Scottish Officer believes that supplying recorders with the latest flora is highly motivating.

6.9 Networking

Many people who volunteer do so as a social activity. This is as true of those who carry out work in biological recording as it is in other fields. To achieve this it is important that people feel part of a network and have opportunities to communicate with others in the network (whether this is local or national) and feel part of a "club". This can help engender a sense of belonging and build a commitment from volunteers. Although it is not always possible to engineer this process it is important to facilitate it wherever possible. This is easier than ever with the use of internet discussion forums, Facebook pages etc where the volunteer community, with a little help at the start, can support each other and share news and information. However, it is important to consider other technologies to provide information, to avoid alienating those without easy access to the internet, and to make sure there are sufficient face to face events.

In most voluntary Scottish-wide recording bodies there is some degree of a 'branch' structure and there is often a network of individuals to ensure that the recording effort covers

the whole country (e.g. vice-county recorders for the National Moth Recording Scheme and the Botanical Society of the British Isles). These individuals collect and collate records from their area and implement verification procedures to ensure that the data collected are accurate and reliable. This allows direct contact with individual recorders and results in data being passed to the national organisation which are already checked.

A good example of this is the question of rare bird sightings where a possible record is processed for verification by the SOC, initially through the Local Recorder and then the Local Records Committee, where one exists, and, if necessary, eventually passed to the Scottish Birds Records Committee. However, very important records of breeding birds are submitted to the Rare Breeding Birds Panel covering the whole of the UK.

Networks often allow new recorders to contact someone relatively local and for groups of recorders to work together. However small recording schemes do not have this kind of support and can only use the recorders they have.

The use of websites is becoming more and more popular with many very local groups (e.g. the Angus Birding Grapevine) and can include all the many aspects of the group's activities alongside photographs etc. There are many discussion groups where specific questions about identification and/or local sightings can be discussed. Many are much more general and cover a range of species groups and subject areas such as The Wildlife Web Forum (see reference, page 53) which covers NE Scotland.

6.10 Feedback mechanisms

It is generally accepted that feedback is essential, especially as the number of recorders within a group increases. When the organisation includes paid staff and operates on a national scale then an individual recorder just becomes a small contributor to a large dataset which is used for other purposes often far removed from the original motivation that encouraged that recorder into the field.

What is included in feedback can vary enormously but includes everything from acknowledging people's data/time contributions (simple emails or postcards are effective at doing this), information about the contribution made by the volunteers as a whole (how many records collected each year etc), updates on how data are being used and who they are provided to.

The former Director of the BTO identified feedback as the key to running such an organisation and there is a suite of mechanisms to provide it to the network of recorders. These include regular newsletters (now often provided electronically) especially targeted ones about the actual project which the data were provided for, detailed analysis about progress (again normally via the web), regional or local workshops or conferences and access to reports. It is also very critical to ensure direct communication to the recorder via any network in place or via emails.

Feedback can also be an opportunity to encourage volunteers to develop new skills or expand their work. Although this can be done *en masse*, direct one to one communication is more effective and can take into account the previous experiences of the volunteer, form example by asking recorders to cover an additional survey site near one they already visit, or by suggesting further training now they have reached a high standard in one particular area.

7 CONCLUSIONS AND FRAMEWORK FOR ACTION

Biological recording is a complex subject and operates at many different levels of skill. This study has obtained material evidence about biological recording in Scotland from a wide range of sources including schemes, expert recorders, very experienced recorders, general recorders, volunteer managers and project organisers. Many of these individuals have considerable experience both in the field and of their fellow volunteers and the guidance they have supplied clearly reflects the strengths, and the weaknesses, of the present state of biological recording in Scotland.

7.1 Conclusions

A number of strong themes have emerged which are echoed both across the various recording schemes, individual volunteers and the other sources of information.

7.1.1 Working with volunteers in biological recording

There are real advantages of working with volunteers. The Tracking Mammals Partnership and NBN report on Engaging with Volunteers (2005) showed that these advantages included better site coverage; volunteers are often highly motivated and have unique local knowledge of areas. This report also noted that the use of volunteers is also economic as not only are the costs of using staff tenfold that of using volunteers but many volunteers will meet their own costs of travel etc.

There are also a range of disadvantages of working with volunteers. These can include uncertainties as to whether the work will be completed or the data returned. Volunteers often need more intensive management than paid professionals and there is often a lack of the necessary skills.

The number of volunteers engaged in biological recording is considered to be inadequate in many cases. In the survey of biological recording scheme, group and project coordinators only 23% reported that current volunteering effort met their needs (see Table 4). They also highlighted that problems with data coverage was often associated with availability of volunteers especially in remote areas of Scotland, 60% or respondents to the survey of scheme, group and project coordinators reported that geographic coverage was a problem. One respondent said 'a*s with recording any taxonomic group in the Highlands, there are geographical gaps in the more sparsely-populated and remote areas.*'

Volunteering programmes for biological recording are not commonly linked in with existing volunteer networks such as Volunteers Centres and SCVO (SNH, 2007). There are likely to be missed opportunities here in terms of advice, support and recruitment. There is now a new focus for environmental volunteering though the Forum for Environmental Volunteering Activity, FEVA, which may prove valuable to those running volunteer biological recording projects and schemes. For some small schemes and local groups this will be difficult to do directly and there will be considerable benefits in working collaboratively to access these resources.

7.1.2 Engaging and recruiting volunteers

Most recorders are inspired by the countryside and wildlife and start their interest at a young age. In the survey of individual recorders 30% of respondents reported that their interest had developed in childhood (see Figure 6). However, specific people and specific experiences in later life can trigger a wish to record. There is a link between the availability of these opportunities and the number of individuals coming forward to volunteer.

Recruiting recorders from the general public has also been developed through popular awareness raising events and simple recording projects often web-based. Examples of such initiatives include the BBC Breathing Places programme and Butterfly Conservation's Orange Tip postcards. The idea of starting an interest in recording through these methods is widespread but little factual information is available to show how effective it is.

Various initiatives have explored recruiting new recorders from groups not usually associated with the subject including countryside rangers, students, schools, children, fishermen, farmers, land managers and foresters with various degrees of success (see section 6.2.6). Experience from these experiences need to be shared and the emphasis on follow-through recognised. There is also a potential for better engagement with community groups as demonstrated by the Open Air Laboratories Network (OPAL) in England and Wales.

There needs to be simple, easy ways for people to become engaged in biological recording. One respondent to the survey of individual volunteers responded "*Very keen to undertake more survey work, but don't know how to find out where such voluntary activities happen*". While information can be made available nationally a local link is very valuable enabling people to develop local links to suit there own motivations. This is a two way information flow enabling organisations and groups to seek volunteers and individuals to find volunteering opportunities. A very effective mechanism of making this is through a local records centre, as was demonstrated in the review of Local Records Centres in the UK commissioned by Natural England (2007) which looked at the services provided to volunteers by Centres.

7.1.3 Support for volunteers

A structured support system provided by professional staff (volunteer managers) is a proven effective way of doing this. Analysis of the opportunities for environmental volunteering to deliver Scottish Government's policies (Dalgleish, 2006) concluded that "volunteer managers are critical to the whole experience of the volunteer and to the delivery of many of the potential outcomes".

There is a need for long-term support to enable volunteers to develop and become self-supporting. A recent Biological Recording in Scotland project, Wildlife Counts (BRISC, 2008) specifically set out to create biological records, engage with volunteers and raise awareness of biodiversity concluded that the process of developing volunteers as biological recorders is a long-term investment, short-term projects engaging volunteers must link into long term programmes for volunteer support and development

A wide range of supporting services for volunteer recorders have been developed by the various voluntary recording groups. In the survey of scheme, group or project coordinators the most frequently provided services were an identification service (83%), recording events or field trips (75%) and provision of recording guidelines (71%) (see Figure 17). In the survey of individual volunteer recorders the services most used were websites (72%), recording forms (66.5%) and recording guidelines (65%) and 14.5% would like mentoring but thought it was not available from the scheme they were reporting on (see section Figure 10). Most recorders require, or at least value, clear instructions about the recording they are doing, both in terms of the purpose of the work and techniques used.

Identification help is being developed as a result of the increasing interest in new groups and the demand for accurate identification. These include innovative web-based keys and photographs and the production of new identification material but there are still significant gaps. One respondent to the individual volunteer's survey reported that "*For most invertebrate groups good ID keys are not available and this should be addressed ASAP using web based keys, digital photos, scanning microscope images etc*". It is clear that more help with identification would enable volunteers to do more or better recording. In the survey of individual recorders 39% said that someone to help with identification would encourage them to do more recording.

It is clear that in some cases the lack of resources form a barrier to more recording for some volunteers. Acess to microscopes, identification guides, the internet and recording software as well as to travel costs are all material factors in individuals being in a position to undertake training and recording. One respondent to the survey of individual volunteers reported '*Being an active County Recorder in a part of Scotland with very few other*

recorders, to achieve anything like reasonable coverage requires a lot of travel, and this is, I feel, becoming very expensive. I do not need to make money from my recording, but I feel that a proportion of the costs should be covered by those who wish to use the data'. Taking these costs (often borne directly by the volunteers) into account when planning would add considerably to the credibility of any new recording scheme and its uptake by a wider range of volunteers.

7.1.4 Motivation

Volunteers carrying out biological recording do so for a wide variety of reason. Most are motivated by altruistic reasons such as contributing to wildlife conservation (19.5% of respondents to the individual volunteers survey) or to contribute to research (15.5% of respondents to the individual volunteers survey). Also high on the list of motivating factors are more personal issues such as gaining knowledge of wildlife, the opportunity to develop skills and for enjoyment (see Figure 7) Work looking at the functioning of the Wildlife Trusts (Institute for Volunteering Research, 2007) noted that "for many people, volunteering acted as an important point of social contact, a source of friendships and an opportunity to work as a team."

Feedback is seen as a key to getting the best from volunteer recorders, and retaining their input. Feedback from the recording organisations is received very well by volunteers, whether this is generic or personal. One respondent to the survey of individual volunteers reported that there needed to be *"Recognition of the huge amount of time, effort and financial resources required by volunteer recorders".* The 'Amateurs as Experts' project (English Nature, Lancaster University and the Natural History Museum, 2005), reported that amateur expert naturalists had some strong assumptions about conservation agency staff, including "only wants data and is not interested in the well being of amateur expert naturalists as individuals or communities"

Associated with the need to ensure that volunteers are motivated there is a concern that too many demands on existing recorders could result in recorder fatigue. An individual responding to the volunteer survey reported *"The many recording groups/schemes which operate nationally and locally are largely drawing on the same limited pool of people here. There is a danger of volunteer fatigue/burn-out".*

7.1.5 Training and mentoring

Training is also regarded as essential service for the development of a skilled network of volunteers. Of the schemes, groups and project coordinators surveyed 65% offered some form of training and a further 20% would like to offer training to volunteers. From the survey of individual recorders a 36% of recorders would value more training and half of competent and expert recorders act as trainers and/or mentors.

Various forms of accreditation of the volunteer recorders do exist, some of which have had noted success such as the BTO bird ringing permit scheme and the BSBI Field Identification Skills Certificate. In the survey of individual recorders only 13.5% of respondents use an accreditation scheme but a further 13.5% would like to have one available to them. This was reflected in the survey of scheme, group and project coordinators where 25% offered an accreditation service and a further 18.5% would like to offer a system. There is clearly scope for further development in this area.

Mentoring, providing support and advice over a period of time to help an individual develop their skills e.g. meeting regularly to do field work together or helping with identifications, is proven to be a very effective mechanism for developing skills. The BTCV Scotland "Natural Talent" scheme relies heavily on the process of mentoring. Many experts, both professional and voluntary, have contributed their time to mentor competent 'apprentices' who wanted to learn from them. There is scope to expand this technique to operate at local and national levels.

7.1.6 Data systems and IT developments

Prior to establishing any biological recording scheme or project the data needs must be identified (i.e. who need the data and for what purpose), systems must be put in place for the data to be managed and made available and the long term custodian of the data identified. The report from the Tracking Mammals Partnership and NBN (2005) noted that survey objectives must be clear to the volunteers especially what they are being asked to do and why they are asked to do it.

The BRISC Wildlife Counts project exit report (BRISC, 2008) concluded that recording work carried out, whether by a beginner or expert needs to feed into some framework to ensure that records are used and made available. Feedback must be available from this framework to volunteers so they know who uses their records and how. The increasing availability, effectiveness and use of computer technology shows that new projects involving recording should have at their core an efficient and effective programme for collecting and digitising the data generated regardless of how generalised or specialist they are.

Recording schemes have shown that it is quite practical to set volunteers high standards of accuracy and of data processing. In the majority of schemes the quality of recording is regarded by the organisers as high. In the survey of biological recording scheme, group and project coordinators 81% of respondents reported that data quality from volunteers was high (see Figure 18).

Technical advances to assist recorders with recording are increasingly in demand including GPS, recording software, on-line recording and digital photography. The Garden BirdWatch run by the BTO, has seen the percentage of online submissions of records across the UK rise from 20% in 2003 to 50% in 2009. More opportunities to enable these new technologies to be available to volunteer recorders would be valuable The Field Studies Council reports that one of the most requested training courses in Scotland is for the use of technology (e.g. GPS, recording software) for recording.

7.1.7 Use of data

Individual volunteer recorders contribute data across a wide range of different species groups. Interestingly the average number of species groups recorded by respondents to the survey of individual recorders was three (see Figure 1).

There are a wide range of policy drivers for the biological data that are being collected by volunteers (see section 2.1.1). Some of the schemes, groups and projects that responded to our survey recognise these drivers in their objectives, 35% had contributing to conservation action built into their objectives.

Data gathered by schemes, groups and projects are widely disseminated. In the survey of coordinators significant numbers passed data to other bodies that themselves act as suppliers of data - Local Records Centres (67%), National recording schemes (65%) and the NBN Gateway (52%). Although this does not show who is using the data it shows that data are being made available to key bodies that disseminate data. In the same survey significant numbers of schemes, groups and project made data available directly to potential users - conservation agencies (44%) voluntary conservation bodies (38%) and research institutes (31%)

There is evidence that volunteers can carry out complex recording activities outwith the standard species recording (presence or absence at a location on one date) routinely carried out. Volunteers have been used to carry out Site Condition Monitoring on SSSIs, collecting data in long-term population monitoring programmes, but not without difficulties. Successful projects include Plantlife's Flora Guardians scheme, the bat roost monitoring organised by the Bat Conservation Trust and the local bat groups and the Scottish Raptor Monitoring Scheme run by the Scottish Raptor Study Groups. All these carry out long term monitoring which could not be done without the network of volunteers. Volunteer recorders have also been able to carry out Phase 1 habitat surveys working alongside a professional surveyor

using volunteers, as has been carried out by North east Scotland Biological Records Centre (NESBReC).

7.2 Proposed vision

From these conclusions we have developed an overall vision which could be considered as a basis for developing all future recording initiatives involving volunteers.

The vision is for volunteer biological recording initiatives:

- to recruit, inspire, train and encourage volunteers into biological recording at all levels,
- to ensure that the volunteer experience is rewarding and fulfilling and includes opportunities for personal development and learning,
- to enable volunteers to produce relevant, valuable data to the highest possible standards that are used; and
- to provide a man-power resource that goes further to meeting the needs of biological recording.

7.3 Framework for Action

Building on the conclusions a framework of practical actions is proposed which should provide sound guidance for the development and expansion of biological recording in Scotland in the future. There are eight key actions identified that should be taken into account in considering any new volunteer biological recording programmes, but also in looking at developing and expanding exiting ones.

This framework could be used as a means of assessing project proposals involving volunteers in biological recording.

Table 8   Actions for improving volunteering in biological recording

	Action	Explanation
1.	**Ensure that the process of increasing the number of volunteer recorders and improving their recording skills includes a long-term component.**	Supporting volunteers and developing biological recording skills is a long-term process involving gaining experience and developing high levels skills. Work on developing biological recording skills must consider how volunteers will continue to develop their skills after any time restricted project. Any projects that engage volunteers must think about how volunteers will be supported in the long-term (looking ahead say five years) even if this is beyond the scope of the project. Volunteers may need to be linked with other existing networks. Any new input to increase the numbers of volunteer recorders should also be long-term.

	Action	Explanation
2.	**Consider the role of professional volunteer managers in all projects or schemes engaging volunteers.**	The mix of professional staff and volunteers is key to the expansion in numbers of recorders and in the improvement in data quality. Staff posts with the specific role of 'managing' volunteers, i.e. recruiting, assisting, encouraging and developing volunteers, are successful. This is critical to improve the quality of the volunteer experience and to maximise the benefits to the organisations and recording community of training/supporting individuals
3.	**Make information available on all aspects of biological recording through one specific, local source.**	There is a diverse range of opportunities for engaging in biological recording at both a local and national level. A simple single source of information on these opportunities would be useful. At a local level this function can rely on personal contact and be part of the process of developing recorders. Where they exist local record centres are often well placed to take on this role.
4.	**Be imaginative in recruiting new volunteers, work with existing community groups and nurture new volunteers to engage them in biological recording.**	Recruitment of new volunteer recorders is crucial if there is to continue to be networks of skilled volunteers available into the future. Most new volunteers will not be skilled in recording when they come forward and they need to be nurtured through the process of development and engagement. Recruiting new volunteers need to be imaginative and should particularly look to empathetic groups, especially existing community groups. In recruiting new volunteers emphasis should be placed on the social, health and community benefits of engaging in recording, as well as the interest of the science.
5.	**Expand training for volunteers and consider improvements to the organisation and structure of training programmes**	More targeted training at all levels is needed. Coordination of training opportunities and resources is essential especially to make good use of the range of experts and specialist willing to contribute their time. Training and courses should be structured with identified levels of courses, certificates for attending courses and recording the 'career' of a volunteer as they gain experience and expertise and become trainers.
6.	**Prioritise the feedback mechanisms to volunteer recorders and ensure their effectiveness.**	Feedback has been shown by both individual recorders and recording schemes to be the reward system that really works. If recorders know why they are collecting data, what happened to the data and what use has been made of their information they will feel both rewarded and a closer part of the recording scheme. Schemes or projects should invest considerably in setting up volunteer feedback of a robust, reliable and ongoing nature. This must be at the heart of any volunteer engagement programme.
7.	**Take advantage of the existing framework of support for volunteers and organisations working with volunteers.**	There is a well established framework in Scotland for encouraging and supporting volunteers. Volunteering programmes focussed on biological recording take advantage of the support and networks that already exist.
8.	**Define, prior to setting up a scheme or project, the process of record handling from the original data requirements, through the field recording to the data's use.**	Prior to establishing any biological recording scheme or project the data needs must be identified, systems must be put in place for the data to be managed and made available and the long term custodian of the data identified.

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Web resources

BBC Breathing Places	www.bbc.co.uk/breathingplaces/
Big Garden Birdwatch (RSPB)	www.rspb.org.uk/birdwatch
Botanical Society of the British Isles – County Checklists	www.bsbi.org.uk/checklists.html
British Trust for Ornithology (BTO) – Bird Ringing scheme	www.bto.org/ringing/ringinfo/become-a-ringer.htm
BTCV Natural Talent	www2.btcv.org.uk/display/naturaltalent
East of Scotland Branch, Butterfly Conservation	www.eastscotland-butterflies.org.uk/mothflighttimes.html
Field Studies Council, Biodiversity Training Project	www.field-studies-council.org/biodiversity
Garden Birdwatch (BTO)	www.bto.org/gbw
Highland Biological Recording Group (HBRG)	www.hbrg.org.uk
Lepidoptera Dissection Group	www.dissectiongroup.co.uk
National Barkfly Recording Scheme	www.brc.ac.uk/schemes/barkfly/homepage.htm
National Biodiversity Network Gateway	data.nbn.org.uk
National Biodiversity Network Trust - Supporting local records centres	http://www.nbn.org.uk/getdoc/2568318d-f729-4a54-94e0-5dd92514aebe/Runnig-and-managing-LRC.aspx
Open Air Laboratories Network (OPAL)	www.opalexplorenature.org/
Scottish Countryside Rangers Association (SCRA)	www.scra-online.co.uk
Scottish Moths discussion group	http://tech.groups.yahoo.com/group/ScottishMoths/
Seasearch (Marine Conservation Society)	seasearch.wisshost.net/index.htm
UK Moths	http://www.ukmoths.org.uk/
UK Phenology Network / Nature's Calendar Survey (The Woodland Trust)	www.naturescalendar.org.uk
Wildlife Web Forum (North East Scotland)	www.wildlifeweb.co.uk/forum/

ANNEX A.   RESEARCH PROJECT CONSULTATION

Organisation Name	Name
Bat Conservation Trust	Anne Youngman
Biological Recording in Scotland	Anne-Marie Smout
Birmingham University School of Biosciences	Dr Sara Whild
Botanical Society of Scotland	Barbara Sumner
Botanical Society of the British Isles	Andy Amphlett
Botanical Society of the British Isles	Michael Braithwaite
Botanical Society of the British Isles	Jim McIntosh
British Arachnological Society	Mike Davidson
British Trust for Ornithology	Dr Jeremy Greenwood
British Trust for Ornithology (Scotland)	Robin Anderson
British Trust for Ornithology (Scotland)	Mandy Cook
British Trust for Ornithology (Scotland)	Dr Liz Humphries
BTCV Scotland	John Macfarlane
BTCV Scotland	Jo Mould
Buglife	Craig Macadam
Butterfly Conservation	Duncan Davidson
Butterfly Conservation	Paul Kirkland
Butterfly Conservation	Dr. Tom Prescott
Butterfly Conservation	Dr Mark Young
City of Edinburgh Ranger Service	Stacy Schumacher
Dipterists Forum	Alan Stubbs
Dumfries and Galloway Environmental Records Centre	Mark Pollitt
Edinburgh Natural History Society	Neville Crowther
Field Studies Council	Pete Boardman
Field Studies Council	Martyn Jamieson
Fife Nature Records Centre	Simon Scott
Glasgow City Council's Land and Environmental Services	Sheila Russell
Glasgow Natural History Society	Richard Weddle
Highland Biological Recording Group	Murdo Macdonald
Highland Regional Council	Jonathan Willett
Marine Conservation Society	Callum Duncan
Midlothian Rangers	Jo Cooke
National Federation for Biological Recording	Trevor James
National Trust for Scotland	Linsay McKinlay
North East Scotland Biological Records Centre	Glenn Roberts
Paisley Natural History Society	Tom Byars
OPAL (Open Air Laboratories Network)	Lucy Carter
Pentland Hills Ranger Service	Nigel Franklin
Plantlife	Dr. Deborah Long
RSPB Scotland	Lisa Webb
Scottish Natural Heritage	Alan Cameron
Scottish Natural Heritage	Niall Corbet
Scottish Natural Heritage	Scott Ferguson
Scottish Natural Heritage	Simon Foster
Scottish Natural Heritage	David Genney
Scottish Natural Heritage	Iain MacDonald
Scottish Natural Heritage	Claire Seymour
Scottish Natural Heritage	Laura Steele
Scottish Natural Heritage	Ian Strachan
Scottish Natural Heritage	Dr Chris Sydes
Scottish Ornithologists Club	Ray Murray
Scottish Raptors Study Group	Patrick Stirling-Aird
Scottish Wildlife Trust	Gill Dowse
The Wildlife Information Centre	Bob Saville

Volunteers in biological recording
Questionnaire for Individual recorders

This survey is been co-ordinated by Biodiversity Solutions as part of research for Scottish Natural Heritage exploring the role and effectiveness of voluntary biological recording. The survey intends to gather information about your recording activity - this is when you actually record observations you make. We would appreciate you taking the time to complete this questionnaire to help us with this research.

This survey is intended to gather views from individual recorders if you also organise a recording scheme, group or project then you may also wish to complete our separate survey for organisers.

Email us at info@biodiversitysolutions.co.uk

About you and your interests

1. What subject areas are you interested in?
Please tick all those areas you are interested in recording.

☐   Higher Plants

☐   Lower plants

☐   Birds

☐   Mammals

☐   Other vertebrates

☐   Insects

☐   Other invertebrates

☐   No specific groups

☐   Other (please specify)

[   ]

2   How often do you do biological recording?
Please select the answer that is closest to your typical recording activity

○   Every day

○   2 or 3 times a week

○   Once a week

○   2 or 3 times a month

○   Once a month

○   5 or 6 times a year

○   2 or three times a year

○   Once a year or less

3   **Is your recording activity restricted to any particular seasons?**
    Please tick all the seasons you record in or choose all year round

☐   Winter

☐   Spring

☐   Summer

☐   Autumn

☐   All year round

4   **Approximately how many biological records do you make in a typical year?**
    This refers to actual records of species or habitats observations - a near estimate will be sufficient

☐

5   **Would you consider yourself to be:**

○   generally interested in natural history
○   learning biological recording
○   a novice biological recorder (in one or more group/subject area)
○   a competent biological recorder (in one or more group/subject area)
○   an expert biological recorder (in one or more group/subject area)

Motivation

6   **How did your interest in biological recording begin?**

☐

7   **Why are you involved in recording?**
    Please tick all that apply

☐   To develop my recording skills

☐   Opportunities to meet like minded people

☐   To contribute to wildlife conservation

☐   To contribute to research

☐   Discovering nature inspires me

☐   To benefit my local community

☐   To gain further knowledge of the subject

☐   It's a puzzle to be unravelled

☐   Other (please specify)

☐

Involvement with schemes or recording groups or projects

8   Can you list any recording schemes, projects or groups that you are involved with?
If you involved with more than five please would you pick out those that you are most active in

> | |
> | --- |
> | |
> | |
> | |
> | |

9   Can you select one of the above recording schemes, groups or projects that you would be able to give us more information about your relationship with?

> | |
> | --- |

10   In relation to the scheme or group you have chosen above which of the following services are available, which of them do you use and, if not available, would you like?

	Services available	Service you use	Services not available but you would like
Public events/Open days	☐	☐	☐
Accreditation of recorders	☐	☐	☐
Web based discussion forum	☐	☐	☐
Recording sheets or forms	☐	☐	☐
Recording events field trips	☐	☐	☐
Identification service	☐	☐	☐
Identification keys	☐	☐	☐
Training	☐	☐	☐
Website	☐	☐	☐
Recording guidelines	☐	☐	☐
Mentoring	☐	☐	☐

Other

11 What would encourage you to do more recording?

☐ I'm doing enough already!

☐ More opportunities for recording (access to sites/field trips etc)

☐ Better networks of like minded people

☐ More support and advice for recording work

☐ More encouragement to keep recording

☐ Access to better identification keys

☐ Someone to help with identification

☐ Being given clearer priorities/direction

☐ Opportunities for training

12 Have you any other comments that might help us with our research?

> [ ]

Personal information
We are asking you some personal questions so that we can assess the demographics of survey respondents.

13 Can we have your name?

> [ ]

14 Where do you live?

> [ ]

15 What age group are you in?

○ Under 18
○ 18-25
○ 26-40
○ 41-65
○ Over 65

For competent and expert recorders only

The questions on this page are for those people who consider themselves to be competent or expert recorders only. If you did not choose either of these categories then please move straight to the bottom of the page and click on finish.

We would like to know if competent and expert recorders are involved in providing mentoring or training for beginner or novice recorders.

Mentoring: **providing support and advice over a period of time to help an individual develop their skills e.g. meeting regularly to do field work together or helping with identifications.**

Training: **providing a training experience to one or more people either in a formal or informal situation e.g. teaching someone to identify species or showing a group recording techniques.**

16 Do you provide mentoring for new or novice recorders?

◯ Yes ◯ No

If yes, in what subject?

[   ]

17 Do you provide training for new or novice recorders?

◯ Yes ◯ No

If yes, in what subject?

[   ]

ANNEX C.   SURVEY OF SCHEME, GROUP OR PROJECT ORGANISERS

Volunteers in biological recording
Questionnaire for scheme, group or project organisers

This survey is been co-ordinated by Biodiversity Solutions as part of research for Scottish Natural Heritage exploring the role and effectiveness of voluntary biological recording.

This survey is intended to gather views from schemes, groups and projects if you also collect biological records yourself you may also wish to complete our separate survey for individual recorders.

Email us at info@biodiversitysolutions.co.uk

Information about your scheme, group or project

1   What is the name or title of your scheme, group or project?

2   Who runs this scheme, group or project?

3   What are the objectives of this scheme, group or project?
If there are wider objectives please only include those that relate to biological recording and/or involving volunteers.

4   Your contact details

Name	
Role	
Email	

Details about the scheme, group or project's activities

5 **What does your scheme, group or project cover (e.g taxonomic coverage, geographic coverage)?**

> [   ]

6 **Is your scheme, group or project currently actively carrying out biological recording in Scotland?**

> ◯ Yes ◯ No

7 **What timescale is your scheme, group or project working over?**
These might be specific dates or it might be ongoing

> [   ]

8 **How many volunteers participate in biological recording linked to your scheme, group or project annually?**
(either last year or your last year of operation)

> [   ]

9 **What is the total number of records generated each year?**
(either last year or your last year of operation)

> [   ]

Working with volunteers

10 Which of these services do you provide for volunteers and which would you like to offer?

	Service you offer	Service you would like to offer
Public events/Open days	○	○
Accreditation of recorders	○	○
Web based discussion forum	○	○
Recording sheets of forms	○	○
Recording events field trips	○	○
Identification service	○	○
Identification keys	○	○
Training	○	○
Website	○	○
Recording guidelines	○	○
Mentoring	○	○

11 Does the current volunteer recording effort meet your scheme, group or project's objectives?

○ Yes ○ No ○ Partly

12 What are the successes or shortcomings of the volunteer recording effort in contributing to your objectives?
Please select the most relevant answer. If any subject does not apply to your scheme, group or project then please select not relevant.

	Inadequate	Poor	Average	Fair	Good	Not relevant
Number of volunteers	○	○	○	○	○	○
Taxanomic coverage	○	○	○	○	○	○
Geographic coverage	○	○	○	○	○	○
Data quality	○	○	○	○	○	○

Recruiting new volunteers

13 Do you try to recruit new volunteer recorders?

◯ Yes ◯ No ◯ Not actively

14 Which techniques do you use to recruit new volunteers and which do you think might be useful techniques?

	Already Use	Might use	Not relevant
from wider membership	◯	◯	◯
public events	◯	◯	◯
targeted one to one recruitment	◯	◯	◯
through existing participants	◯	◯	◯
by providing information for beginners	◯	◯	◯
website pages	◯	◯	◯
training for beginners	◯	◯	◯
from members of other schemes	◯	◯	◯

Data

15 Who do you pass/have you passed data to?

☐ NBN Gateway

☐ Local records Centre(s)

☐ Conservation Agencies

☐ Voluntary conservation bodies

☐ Research institutes

☐ National recording schemes

☐ No one

☐ Other (please specify)

16 Is your scheme, group or project specifically designed to meet the needs of any other organisations? If so please state what organisations and which needs you are meeting.

17 Are there any gaps in the data coverage generated by your scheme, group or project?
These might be geographic, temporal etc

And finally…

18 Are there any improvements or expansions that would help your scheme, group or project achieve its objectives?
Please list up to three

> | |
> | --- |
> | |
> | |

19 Do you have any other comments that might help us with our research?

> | |
> | --- |

ANNEX D.   SUMMARY OF RESPONDENTS TO THE SURVEY OF PROJECT ORGANISERS

Scheme, Group or Project: Aquatic Coleoptera Conservation Trust
Objectives*:* To support research on rare and endangered wetland beetles, particularly those with Species Action Plans in the UK BAP
What does the Scheme, group or project cover? wetland beetles
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? no specific dates
How many volunteers participate annually?   60
What is the total number of records each year (estimate)?   10,000

Scheme, Group or Project: Aquatic Heteroptera Recording Scheme
Objectives*:* To collect and collate information on the distribution and ecology of water bugs in Britain and to make this information available to the wider public
What does the Scheme, group or project cover? All water bugs in Britain.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually?   20
What is the total number of records each year (estimate)?   6,000

Scheme, Group or Project: Berwick Wildlife Group
Objectives*:* Raise awareness of local wildlife Encourage people to appreciate wildlife Train people in the principles and practice of wildlife recording Gather data and publicise this to assist in conservation (in the broadest terms)
What does the Scheme, group or project cover? Geographic - around Berwick upon Tweed (North Northumberland, small part of Scottish Borders) Taxonomy - whatever we have or can gain expertise in - lichens to mammals.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually?   40
What is the total number of records each year (estimate)?   2,000

Scheme, Group or Project: Biodiversity Volunteers
Objectives*:* To get members of the public that are interested in parks and wildlife involved with a range of projects led by the countryside ranger service. This includes practical tasks such as planting rock whitebeam, clearing gorse, or raking meadows, but also includes assisting the service with undertaking biological surveys. Volunteers currently help with a regular butterfly survey, otter survey, surveying invasive species, and more is to come.
What does the Scheme, group or project cover? Volunteers in the 11 parks the CECCRS manage in Edinburgh, currently getting volunteers to survey a range of species -- butterflies, otters, plants
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually?   6
What is the total number of records each year (estimate)?   -

Scheme, Group or Project: Botanical Society of the British Isles (BSBI) - in Scotland
Objectives*:* To promote a better understanding of the British & Irish vascular plant flora and its distribution, and to use this knowledge to help with its conservation.
What does the Scheme, group or project cover? Taxonomic: vascular plants & charophytes Geographic: The British Isles and Ireland
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing. But we organise time limited projects e.g. current 5 year Threatened Plant monitoring Project.
How many volunteers participate annually?   100
What is the total number of records each year (estimate)?   100,000

Scheme, Group or Project: Buteshire Natural History Society
Objectives*:* To foster interest in the archaeology, history, flora, fauna and geology of Buteshire
What does the Scheme, group or project cover? Flora and fauna of the former county of Buteshire - effectively VC100. Most activity with ferns and flowering plants, birds, non-marine isopods, lepidoptera, dragonflies
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually?   -
What is the total number of records each year (estimate)?   -

Scheme, Group or Project: Butterfly Conservation's Macro moth recording scheme
Objectives*:* To map the distribution of macro-moths for the first time
What does the Scheme, group or project cover? UK macro moths
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Current project ends 2010
How many volunteers participate annually?   10
What is the total number of records each year (estimate)?   2,500

Scheme, Group or Project: Butterfly Surveys in Scotland
Objectives*:* To obtain butterfly records for the rarer habitat specialist species and also data on the habitat and condition .
What does the Scheme, group or project cover? Habitat specialist butterflies in Scotland: Pearl-bordered Fritillary; Chequered Skipper; Mountain Ringlet
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Fieldwork severely limited by flight periods of adult butterfly.
How many volunteers participate annually?   6
What is the total number of records each year (estimate)?   123

Scheme, Group or Project: East Renfrewshire, Renfrewshire & Inverclyde LBAP
Objectives*:* To conserve priority habitats & species
What does the Scheme, group or project cover? Old VC Renfrewshire
Actively recording in Scotland?   No
What timescale is the scheme, group or project working to? n/a
How many volunteers participate annually?   0
What is the total number of records each year (estimate)?   0

Scheme, Group or Project: Fair Isle biodiversity monitoring
Objectives*:* To capture all biodiversity records for Fair Isle apart from birds, butterflies, cetaceans and seals (which are the remit of Fair Isle Bird Observatory
What does the Scheme, group or project cover? All groups except birds, cetaceans, seals, butterflies
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? all records, historical, current and ongoing
How many volunteers participate annually? 20
What is the total number of records each year (estimate)? 1,000

Scheme, Group or Project: Fife Nature Records Centre
Objectives*:* Provide quality biodiversity information service for Fife and work in partnership to deliver biodiversity projects and initiatives across Fife.
What does the Scheme, group or project cover? Fife administrative area. All taxonomic groups.
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Currently in year 1 of a 3 year funding period i.e. 2009 to 2012.
How many volunteers participate annually? 45
What is the total number of records each year (estimate)? 17,758

Scheme, Group or Project: Fungus Group of South East Scotland
Objectives*:* Recording fungal diversity within South East Scotland
What does the Scheme, group or project cover? Basidiomycetes and larger Ascomycetes in South East Scotland
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 25
What is the total number of records each year (estimate)? 885

Scheme, Group or Project: Glasgow Living Water Project
Objectives*:* The Project aims to enhance and create ponds within Glasgow with the assistance of local communities and volunteers. Surveying of the projects sites with volunteers will also be carried out and training provided.
What does the Scheme, group or project cover? Currently the project is running within the Glasgow City Council area. Focus will be on amphibians, but also wider biodiversity, priority to flora and fauna associated with ponds. We will raise awareness of reptiles through the project but there are currently no reliable records for Glasgow
Actively recording in Scotland? No
What timescale is the scheme, group or project working to? Currently the project is running for two years and is due to finish in July 2011. We are due to start biological recording next week.
How many volunteers participate annually? -
What is the total number of records each year (estimate)? -

Scheme, Group or Project: Glasgow Natural History Society
Objectives*:* to encourage the study of natural history, principally in the West of Scotland
What does the Scheme, group or project cover? all taxonomic groups (in theory), mainly in west central Scotland
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? ongoing since 1851
How many volunteers participate annually?   45
What is the total number of records each year (estimate)?   2,300

Scheme, Group or Project: Heron Wood Project
Objectives*:* To monitor and record all the fungi occurring on the Dawyck policies
What does the Scheme, group or project cover? All aspects of mycology including interactions with other organisms
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Open ended presently 17years
How many volunteers participate annually?   3
What is the total number of records each year (estimate)?   1,500

Scheme, Group or Project: Highland Biological Recording Group's (HBRG's) Mammal Atlas Project
Objectives*:* To increase our knowledge of the basic distribution of mammals in the HBRG area (as a prerequisite to more detailed or systematic monitoring in the future) To encourage the habit of keeping written records by resident and visiting naturalists To make the resulting information available to inform conservation management, education and land use/development planning
What does the Scheme, group or project cover? Terrestrial mammals (i.e. including bats and pinnipeds, but excluding cetaceans) in Highland (i.e. area covered by The Highland Council)
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? We started the Mammal Atlas in 1999 as a five-year project...BUT have continued until the end of 2009 and are now in the process of writing it up for publication - so it has been 10 years!
How many volunteers participate annually?   120
What is the total number of records each year (estimate)?   2,000

Scheme, Group or Project: Highland Ringing Group
Objectives*:* To further understanding of birds in the Highlands. In particular studies on the ecology and movements of waders and wildfowl.
What does the Scheme, group or project cover? All birds in Highland region.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? 31 years
How many volunteers participate annually?   30
What is the total number of records each year (estimate)?   35,000

Scheme, Group or Project: Hoverfly Recording Scheme
Objectives*:* To assemble data on hoverflies that are used for a range of analyses - distribution, climate change responses etc.
What does the Scheme, group or project cover? Family Syrphidae. UK
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing

How many volunteers participate annually? 10
What is the total number of records each year (estimate)? 1,500

Scheme, Group or Project: John Muir Trust monitoring volunteers group
Objectives*:* To assist the scientific aims in conservation management of the JMT by carrying out monitoring of various types on properties owned by the JMT
What does the Scheme, group or project cover? All properties owned by JMT, any species found on them
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 30-40
What is the total number of records each year (estimate)? -

Scheme, Group or Project: Mammal Society County Records
Objectives*:* Compile and maintain a record of the mammals found in the counties and their locations.
What does the Scheme, group or project cover? Mammals in Dumfriesshire, Kirkcudbrightshire and Wigtonshire.
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 100
What is the total number of records each year (estimate)? 2,500

Scheme, Group or Project: Millipede Recording Scheme
Objectives*:* Collation of data on distribution and ecology of millipedes occurring in Great Britain and Ireland
What does the Scheme, group or project cover? millipedes
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 50
What is the total number of records each year (estimate)? 1,000

Scheme, Group or Project: Mycologia Scotica
Objectives*:* To revise Stevenson's Mycologia Scotica
What does the Scheme, group or project cover? To catalogue all fungi found in Scotland
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Basidiomycetes complete; other fungal groups at present open ended
How many volunteers participate annually? 50
What is the total number of records each year (estimate)? 750

Scheme, Group or Project: National Amphibian and Reptile Recording Scheme
Objectives*:* Assess status and distribution of UK herpetofauna, and changes in these parameters.
What does the Scheme, group or project cover? amphibians and reptiles
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 400
What is the total number of records each year (estimate)? 10,000

Scheme, Group or Project: National Barkfly Recording Scheme
Objectives*:* To promote the recording of Barkflies in Britain and Ireland in order to have baseline data to determine the conservation needs of the group. To increase awareness of a poorly known group. To promote research into the biological requirements.
What does the Scheme, group or project cover? Barkflies (outdoor Psocoptera) in Britain & Ireland
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 10
What is the total number of records each year (estimate)? 1,000

Scheme, Group or Project: National Moth Recording Scheme
Objectives*:* To collate county records for national distribution mapping for conservation purposes.
What does the Scheme, group or project cover? Moths in VC85 (most of Fife and Kinross)
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 15
What is the total number of records each year (estimate)? 1,000

Scheme, Group or Project: National Stonefly Recording Scheme
Objectives*:* To map the UK distribution of stoneflies (Plecoptera) and gather information on their ecology and life history. (Personally I also record several other groups of invertebrates).
What does the Scheme, group or project cover? Plecoptera UK wide. I also record the following groups: odonata, trichoptera, the neuropteroid families, psocoptera and some diptera (hoverflies, greater brachycera, empididae)
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 5
What is the total number of records each year (estimate)? 5,000

Scheme, Group or Project: Natural Talent
Objectives*:* The scheme is filling the gaps in taxonomy & habitat management expertise.
What does the Scheme, group or project cover? The scheme is delivered in Scotland and Northern Ireland. The apprenticeships have included Hymenoptera, Diptera (Hoverfly), Riverflies (Caddis, Mayfly, Stonefly), Invasive Non native species, Lichens, Bryophytes, Fungi, Grassland Management, Machair,
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? The first apprenticeships began in November 2006, and the scheme will run until 2012
How many volunteers participate annually? -
What is the total number of records each year (estimate)? -

Scheme, Group or Project: New Zealand flatworm
Objectives*:* Monitor the spread of the New Zealand flatworm in Scotland
What does the Scheme, group or project cover? Geographical distribution of all terrestrial flatworms in Scotland
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 0

What is the total number of records each year (estimate)?   50-100

Scheme, Group or Project: Nocturnal Ichneumonoidea Recording Scheme
Objectives*:* To record distributions, phenology and host associations of parasitoid wasps that can be sampled by light traps.
What does the Scheme, group or project cover? nocturnal parasitoid wasps of the superfamily Ichneumonoidea from Great Britain, Ireland, the Isle of Man and the Channel Islands
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? first deadline: genus Netelia, preliminary database in 2010, generally ongoing
How many volunteers participate annually?   15
What is the total number of records each year (estimate)?   250

Scheme, Group or Project: Oestridae Study Group
Objectives*:* The group is only recently formed and initial objectives mainly consist of gathering data to enable the distribution and status of the British and Irish fauna to be better known.
What does the Scheme, group or project cover? The family Oestridae sensu the most recently published British list [Chandler, 1998, Handbooks for the Ident. of British Insects series] within the British and Irish Isles, not including the Chanel Islands.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing and open-ended
How many volunteers participate annually?   5
What is the total number of records each year (estimate)?   10

Scheme, Group or Project: Paisley Natural History Society
Objectives*:* To encourage the study of natural history throughout Renfrewshire. To support the conservation of wildlife and habitats throughout Renfrewshire. To maintain links with the Natural History dept at Paisley Museum.
What does the Scheme, group or project cover? County of Renfrewshire
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually?   20-30
What is the total number of records each year (estimate)?   1,000

Scheme, Group or Project: Scottish Badgers
Objectives*:* The protection of badgers, their setts and habitat
What does the Scheme, group or project cover? taxonomic
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually?   500
What is the total number of records each year (estimate)?   800

Scheme, Group or Project: Scottish Nudibarnchs
Objectives*:* To identify and record the diverse nudibranch fauna in Scottish coastal waters.
What does the Scheme, group or project cover? collecting and recording species distribution around Scotland
Actively recording in Scotland?   Yes

What timescale is the scheme, group or project working to? Commenced regular collecting in 1999
How many volunteers participate annually? 1
What is the total number of records each year (estimate)? 200

Scheme, Group or Project: Scottish Ornithologists' Club - Borders Branch
Objectives: Collect & collate bird records from Borders and publish an annual report.
What does the Scheme, group or project cover? Birds
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually? 180
What is the total number of records each year (estimate)? 70,000

Scheme, Group or Project: Scottish Wildlife Trust
Objectives: Recording species found on SWT reserves
What does the Scheme, group or project cover? 123 SWT reserves all over Scotland covering a wide variety of habitats, locations and taxonomic groups
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? There is no specific timescale, but records are collected throughout the year
How many volunteers participate annually? 73
What is the total number of records each year (estimate)? 2,161

Scheme, Group or Project: SWT reserves
Objectives: To record the fauna and flora of SWT reserves
What does the Scheme, group or project cover? All taxonomic groups at Dumbarnie Links reserve, Fife.
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 5
What is the total number of records each year (estimate)? 500

Scheme, Group or Project: Tachinid Recording Scheme
Objectives: Collect info on the ecology and distribution or British Tachinid flies
What does the Scheme, group or project cover? Tachind Flies - Diptera, Tachinidae
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually? 30
What is the total number of records each year (estimate)? 2,000

Scheme, Group or Project: The Conchological Society of Great Britain and Ireland Mapping Scheme
Objectives: To monitor and map the land and freshwater mollusca of the British Isles, and to advise about conservation and management of species and habitats.
What does the Scheme, group or project cover? The Land and Freshwater Mollusca of the British Isles
Actively recording in Scotland? Yes
What timescale is the scheme, group or project working to? Ongoing. We also have historic data going back well over 100 years.
How many volunteers participate annually? 40-45

What is the total number of records each year (estimate)?   18-20,000

Scheme, Group or Project: the Friends of Hermitage of Braid and Blackford Hill
Objectives*:* To conserve and enhance the landscape, biodiversity and sustainable use of the Reserve
What does the Scheme, group or project cover? The nature reserve of Blackford Hill and Hermitage 59.4 hectares
Actively recording in Scotland?   No
What timescale is the scheme, group or project working to? we have a number of projects ongoing- the restoration of the Walled Garden will be over a number of years
How many volunteers participate annually?   2
What is the total number of records each year (estimate)?   1

Scheme, Group or Project: The Wildlife Information Centre for the Lothians and Borders
Objectives*:* to provide public access to biological records and information relating to the natural heritage
What does the Scheme, group or project cover? All taxonomic groups, habitats and sites in the Lothians and the Borders
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually?   100
What is the total number of records each year (estimate)?   5,000

Scheme, Group or Project: The Yorkshire Conchological Society Recording Scheme for Yorkshire
Objectives*:* To record and monitor the molluscan fauna of Yorkshire
What does the Scheme, group or project cover? Land, Freshwater and Marine Mollusca
Actively recording in Scotland?   No
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually?   8
What is the total number of records each year (estimate)?   3,394

Scheme, Group or Project: U.K.B.M.S.
Objectives*:* Butterfly recording in varying habitats
What does the Scheme, group or project cover? Butterfly species in Dumfries and Galloway
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? ongoing
How many volunteers participate annually?   5
What is the total number of records each year (estimate)?   700

Scheme, Group or Project: UK Plume-moth recording scheme
Objectives*:* To promote interest and knowledge about this poorly-known group by collecting and collating ecological and distribution data.
What does the Scheme, group or project cover? Lepidoptera: Pterophoridae in the UK and Ireland
Actively recording in Scotland?   No
What timescale is the scheme, group or project working to? Ongoing, but with CEH we intend to publish distribution maps in 2010
How many volunteers participate annually?   10
What is the total number of records each year (estimate)?   1,000-2,000

Scheme, Group or Project: Vice county 80 moth recorder, National moth recording scheme
Objectives*:* Record distribution of moths in vc80 and involve other recorders in doing so.
What does the Scheme, group or project cover? Macrolepidoptera in vc80*.*
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing.
How many volunteers participate annually?   4
What is the total number of records each year (estimate)?   4,000

Scheme, Group or Project: Volunteer & Farmer Alliance
Objectives*:* To provide free farmland bird surveys for farmers, carried out by local RSPB volunteers. The information gathered is then used to encourage beneficial land management for biodiversity, tailored to the birds recorded in the survey. The project aims to develop a relationship between the RSPB and land managers. An additional aim is for volunteers to have local survey opportunities, develop their ID skills and gain confidence.
What does the Scheme, group or project cover? I personally cover the scheme in the RSPB South & West Scotland region, however the project has recently expanded an now includes full Scotland and UK coverage, including the Isles.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing.
How many volunteers participate annually?   80
What is the total number of records each year (estimate)?   2,520

Scheme, Group or Project: WeBS
Objectives*:* Recording non breeding wetland birds
What does the Scheme, group or project cover? Waterbirds inland Dumfries and Galloway and the North Solway.
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Ongoing
How many volunteers participate annually?   52
What is the total number of records each year (estimate)?   11,000

Scheme, Group or Project: Wildlife in your Community
Objectives*:* To engage with locals and community groups with a view to stimulating and sustaining their interest in biological recording.
What does the Scheme, group or project cover? The workshops cover the areas of Inverclyde, Ayrshire and Glasgow. Workshops include Lichens, Hoverflies, Bryophytes, Moths, General Wildlife, Aquatic Invertebrates, wildflowers and BioBlitz events
Actively recording in Scotland?   Yes
What timescale is the scheme, group or project working to? Late 2011
How many volunteers participate annually?   -
What is the total number of records each year (estimate)?   -

Scheme, Group or Project: Yorkshire Naturalists' Union
Objectives*:* Recording the flora and fauna of the historic county of Yorkshire Watsonian Nice Counties 61-65 with an outlier in VC66 and to support this with training
What does the Scheme, group or project cover? All groups VC61-65
Actively recording in Scotland?   No
What timescale is the scheme, group or project working to? We started in 1861
How many volunteers participate annually?   150
What is the total number of records each year (estimate)?   4,000

ANNEX E.   WORKSHOP ATTENDEES

Name	Organisation
Alan Cameron	Scottish Natural Heritage
Mandy Cook	BTO
Scott Ferguson	Scottish Natural Heritage
Sara Hawkswell	Biodiversity Solutions
Martyn Jamieson	Field Studies Council
Paul Kirkland	Butterfly Conservation
Iain Macdonald	Scottish Natural Heritage
Jim Macintosh	BSBI
John McFarlane	BTCV
Jo Mould	BTCV
Mark Pollitt	Dumfries and Galloway Environmental Resources Centre
Alastair Sommerville	Biodiversity Solutions
Ian Strachan	Scottish Natural Heritage
Chris Sydes	Scottish Natural Heritage

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Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad