The LINNEAN SOCIETY of London

Executive Summary

THE ROLE OF MUSEUMS AND COLLECTIONS IN BIOLOGICAL RECORDING

The Open Plenary Session of the Linnean Society's Taxonomy & Systematics Committee

18th September 2013, Burlington House, London

Meeting Objectives

This open plenary meeting, with some 70 participants, drew on the experience of The Tullie House Museum in Carlisle and the Angela Marmont Centre for UK Biodiversity at the NHM (Natural History Museum) as well as the NBN (National Biodiversity Network) and NFBR (National Forum for Biological Recording) to debate how museums can more effectively engage with recorders and taxonomists for the benefit of all.

Key Conclusions

- **Case studies clearly demonstrate the benefits of a close relationship between museums and recorders in securing greater accuracy when determining biodiversity**
- **Museums want to be used and Recorders want to use museums**
- **But need to improve links with recorders and promote museum use** (turn the vicious circle into a virtuous circle)
- **Opportunities may now be arising to get better recognition of (and therefore funding support for) museum collections in relation to biodiversity and recording**

Barriers and Actions

Barriers	Action to remove barrier	Who takes the lead
Lack of awareness of the location of museums/content of collections	Produce online catalogue of collections/specimens by location/museum, and a register of mentors	NatSCA has initiated this but will require further funding to complete this huge undertaking
Inertia: lack of existing relationships between museums and LRCs	Promote the catalogue to recorders. Publicise case studies (eg Tullie House) that demonstrate the benefit of the effective use of volunteers working alongside properly trained professionals, and particularly integrated partnership working with LRC, via regional workshops, training, mentoring; use the media	ALERC NHM - should set up genuine collaborative projects round the country with natural science units in regional museums to encourage their active use (e.g. using some 'borrowed' specimens from the NHM, with the local museums as the venues, and engaging with local LRCs/societies)
Access difficult – lack of natural history curators	Create demand by approaching museums; lobbying to get collections back; engage the public (Citizen Science) use the media	LRCs
Lack of recognition of the value of museum collections	Raise awareness of value with senior Museum professionals around the country; lobbying to take the opportunities seriously, sell their wares better, and take up the idea of partnership working, seeing collections as resources, developing bilateral agreements with key collections users etc. to gain funding; use the media; involve the commercial sector to establish economic value parameters	NatSCA through Museums Association

Lack of [government] funding (probably due to above and disparate nature of the recording/museum community)	Better coordination: present a unified voice – produce a succinct lobbying document, aimed at senior policy makers, summarising the benefits of exploring this partnership approach; consider regional hubs; involve the commercial sector to establish economic value parameters; use the media	Linnean Society to lead with input from FSC, NatSCA, NFBR
	Develop 'Training the Trainers' modules for the voluntary sector Identify key training providers who will deliver sustainable packages using the internet and Irecord to verify work.	FSC
	Work towards providing an accreditation system of training even for volunteers	FSC
	Share email addresses of participants	LSL

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Breakout discussion sessions

- *What can we do to promote museum use:* **Chaired by Martin Godfrey**
- *The need to improve links:* **Chaired by Paolo Viscardi - National Science Collections Association**

Comments received from people who were unable to get to the meeting

Acknowledgements

Registrants for The Role of Museums and Collections in Biological Recording

Background to the Meeting

Natural science collections have a lasting and irreplaceable value and are highly relevant when defining national biodiversity and conservation goals today. By housing type specimens, vouchers and reference material they are a resource that enables recorders to produce more accurate and reliable data. However, funding for museums is at a critical point, with cuts, closures and the loss of curatorial expertise jeopardizing appropriate care for collections and access for researchers. Without overt use there is a very real possibility that natural science collections will be lost, to the detriment of all.

Why organise this Plenary? The timing was right to be making the case, to stimulate thinking across the two sectors, to test the appetite for change, and to share best practice.

*What the meeting sought from participants***:** Informed opinion, examples of good practice, models for sharing resources, models for spreading costs, questions and comment, positive thinking to lead to more accurate biological records.

*How the outputs will be used***:** To identify benefits and uses, to inform future project ideas, to advise government on the value and benefits of biological recording and natural history collections, to develop collaborative projects as part of a wider strategy on securing biodiversity evidence, and to stimulate and coordinate debate on solutions.

Outline Programme

11.30 *Introduction* by ***Sue Townsend (Field Studies Council) & Keith Porter (Natural England)***

11.45 *Synergy between identification and recording*: ***Stephen Hewitt (Tullie House, Carlisle)***

Steve explained the Tullie House Museum model of how identification and recording effort can be supported to result in more accurate data and debated how it may benefit other museums at times when central funding for natural history curation and indeed for many local museums seems at a critical point.

12.10 *Generating reliable biological records*: ***Teresa Frost (Cumbria Records Centre, Tullie House, Carlisle)***

As manager of the records centre within the museum, Teresa provided an insight into how the synergies between identification and recording have worked, and, as a representative of ALERC (Association of Local Environment Record Centres), gave a national perspective on some of the opportunities, using responses from a questionnaire she had sent to all LRCs (Local Records Centres).

12.30 *How a major museum works with recording societies*: ***Dr John Tweedle (Angela Marmont Centre for UK Biodiversity, Natural History Museum, London)***

John outlined how the NHM, which has the largest natural history collection in the UK as well as an active scientific community, provides an important resource for the recording community, working with biological recorders, including through provision of access to collections, identification support and promotional opportunities.

13.00 Lunch

14.00 *Why Museums Matter*: ***Martin Godfrey (Ecological Consultant, Bryologist and recorder)***

As author of the paper Why Museums Matter (Godfrey, M (2011) British Wildlife, Martin believes museum collections have a lasting and irreplaceable value. He amplified his points and showed how this has worked in Staffordshire.

14.30 *Addressing skills issues within the volunteer recording community* ***John Newbould (NFBR)***

John explained how the NFBR (which is currently changing its constitution) seeks to ensure synergy in supporting its members and working with national recording schemes and societies and other UK wide initiatives and to support local access to collections to aid volunteers in determining their identifications. Great examples were provided of joined up thinking in safeguarding some of our collections.

14.50 *Uploading data to the NBN – the drive for quality* ***Trevor James (NBN)***

The NBN is central to the collation of biological records, depending on uploads largely from the volunteer community. As such it supports any measures that increase the accuracy and number of records submitted. This would include supporting NatSCA, (the Natural Sciences Collections Association) in its aims as outlined in the 2012 Plenary.

15.10 The responsibilities of the recording community and the museums: two break-out sessions to discuss:

- What can we do to improve links? Paolo Viscardi - Chair
- What can we do to promote museum use? Martin Godfrey – Chair
    - What are the priorities for museums?
    - What are the priorities for biological recorders?

16.40 Feedback Sue Townsend – Field Studies Council

17.00 Meeting Close -Wine Reception

The meeting was being tweeted through the day #linneanplenary (see Storify summary online @linnean.org)

More Detailed Summaries of Presentations

Introductory comments by Keith Porter (national specialist at Natural England):

Key fact: c. £1m/day is paid to farmers to conserve biodiversity.

So what do Natural England (NE) do that involves museums and collections? Natural England sees the value as: a source of local information for learning and development (NE staff and wider education); a reference point for validation of species records (LRC and recorders links); a source of expertise and advice for volunteers (coordination of field survey); a repository for voucher specimens for critical species (important part of record verification and confidence); providing project support to encourage museum and LRC collaboration over recording support.

Natural England's role is to: support development of biological recording via the NBN partnership; explore the most efficient ways to validate records as part of a data flow; apply species information from biological recording to improve biodiversity; support volunteer recording via LRCs and some museum funds; stimulate debate and exploration of better ways of working between sectors.

Introductory comments by Sue Townsend (Biodiversity Learning Manager, Field Studies Council)

So what do FSC (Field Studies Council) do that involves museums and collections? FSC provide courses in identification for universities, professionals and amateur learners; lobby government in support of taxonomy; run a series of environmental projects; produce identification publications; generate biological records. These all recognise the value of natural history collections.

In order to meet the needs of today, and demands of the future, we need to continue to grow new experts and stimulate the enthusiasm of volunteers to adopt taxon groups and build (and share) their expertise. Thus, FSC are setting up a sustainable approach **(**FSC Biodiversity Fellows or bio.fell) to deliver skills training to address these needs. As well as a series of traditional face-to-face training courses bio.fell offers a package of supporting resources and mentoring to aid and encourage the transition from enthusiastic volunteer to active recorder. FSC Biodiversity Fellows is funded by the DEFRA (Department of the Environment, Food and Rural Affairs) Fund for Biodiversity in the Voluntary Sector administered by Natural England and runs from 2012-2014. http://www.field-studies-council.org/supporting-you/fsc-projects/current-projects/biodiversity-fellows.aspx

The Natural Sciences Collections Association (NatSCA) is the UK's organisation for promoting the use and care of Natural Science Collections and representing associated museum staff, acting as an advocate, providing training, and promoting best practice within the network of colleagues and affiliated institutions, working with all kinds of collections, large and small – national, local authority, University and independent. http://natsca.info/content/about-us.

Work with DEFRA – eg Making natures values visible: The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on drawing attention to the economic benefits of biodiversity

including the growing cost of biodiversity loss and ecosystem degradation. TEEB presents an approach that can help decision-makers recognize, demonstrate and capture the values of ecosystem services & biodiversity.

The Concerns: We have seen NatSCA and others lament the demise of the museum services and read a paper by Martin Godfrey who will present later today. We are aware of funding cuts leading to the dispersal or even disposal of collections, the redundancy of curators especially of natural history. It seems all doom and gloom, and mirrors some of the concerns of other public services – and of course the limited private museums are also short of funding and support.

We are aware of some initiatives to share resources and better align local recording groups and societies with local connections. We are concerned that some opportunities might be missed and seek to explore ways to make the most of the immerging situation.

The Solutions: Creative solutions are needed, and the Plenary speakers had been asked to present their views on: shared resources, shared aims, collaborative models between biological recording and natural history collections. The evidence presented could then be used to inform decision makers.

Stephen Hewitt (Collections Development Manager and Curator of Natural Sciences, Tullie House Museum):

Synergy between identification and recording

The natural history department at Tullie House was established in 1893 as a direct result of a biological recording project when contacts made in the process of writing a book on the *Vertebrate Fauna of Lakeland* resulted in significant natural history collections being donated to the new museum. Carlisle Natural History Society (CNHS), also established in 1893, has always met in the Museum. The two organisations have a symbiotic relationship.

The world's first local biological records centre was then set up in 1902 by the Museum and CNHS. Throughout the 20th century, the Museum has acted as a clearing house for information on the wildlife of the Lakeland faunal area, the modern-day Cumbria. Digitisation of historical and contemporary data began in the 1990s with collections data and biological records being entered on the Recorder database by expert naturalist volunteers from CNHS.

Cumbria Biological Data Network (CBDN), a partnership of biodiversity data holders and users in Cumbria, was formed in 1999 with Tullie House, was identified as the central repository for biodiversity data in the County. There was intermittent funding for data officers to manage and

disseminate the data. In 2008, CBDN commissioned a Business Plan for a Cumbria LRC. A CBDC Manager was appointed in December 2010, to establish the Cumbria Biodiversity Data Centre. The Museum 'hosts' CBDC on an 'at cost basis'. CBDC is self-financing with ring-fenced funds within the wider Museum reserves. The Centre is mmanaged as a department of the Museum. Strategic direction is provided by a Steering Group of funding organisations, data suppliers and users.

Tullie House Museum provides the following support:

Support for identification from collections: these are the ultimate resource for confirming identifications, together with curatorial taxonomic expertise, a historical perspective and local knowledge. Accessibility is vital - expert volunteers from CNHS update synonymy, arrangement, identifications and digitise collections data to specimen level. Collections attract specialists who then engage with CBDC and *vice versa*.

Support for recording from collections: these can validate the ability/reliability of previous generations of collectors/recorders. Data are often more detailed on specimen labels than when summarised in past publications. Specimens enable recent taxonomic splits to be applied to historical records and overlooked species to be brought to light.

Support for recording from archives: Naturalist's notebooks and diaries archived in the Museum provide further detail and context for specimens and records. The Museum has a library of reference books and journals and also houses the library of CNHS.

Support for recording data: data from collections underpin contemporary distribution atlases. Data from the collections are extracted and entered onto the Recorder 6 database which is shared with the LRC. Historical data at CBDC are very well supported by voucher material. Historical data are vital to provide a proper understanding of the contemporary picture - not just the last 5 years.

Support for recording from contemporary collecting: provides data on critical species which cannot be identified in the field. Provides a long term home for voucher material supporting biological records.

Support for recording from research: collections provide genetic material for studies of historical populations against which contemporary information can be considered. *"one of the huge strengths of the collection is that it stretches back across the last century.." "...the collections at Tullie house have proved an invaluable research asset."*

Support for identification and recording from resources: Tullie House provides a venue for lectures, workshops, meetings, conferences. It runs identification workshops in conjunction with CNHS and CBDC, develops identification aids, and provides display materials, specimens and expertise at *bioblitz* (an intense period of biological surveying in an attempt to record all the living species within a designated area) and other public events alongside CBDC & CNHS.

Support for recording: through public engagement: wildlife gallery and temporary exhibitions promote local natural history and wildlife recording. *"..after my parents had taken me [Tullie House Museum] had a magnetic appeal that demanded frequent visits...I must have spent hours in the bird room, which also had fine displays of local mammals and collections of butterflies and moths....It was an Aladdin's Cave to an eager youngster."* Derek Ratcliffe, 2000. The Virtual Fauna of Lakeland website combines collections and biological records information to inform and encourage further recording in the county.

In turn, CBDC provides support for the Museum by managing the collections database on Recorder 6, and disseminates collections data through the NBN, while raising the profile of the Museum regionally and nationally. CBDC maintains the link between the Museum and the amateur naturalist's community and recorders. Relationship with external organisations resulting from engagement through LRC function has contributed to over £100,000 being generated for natural history exhibitions in the Museum over the last 12 years. CBDC staff increase the number of natural history staff in the organisation, so raising the profile of the subject and changing perceptions.

Together, the Museum, CBDC and CNHS provide a critical mass, complementing and supporting each other to create a momentum for biodiversity study and documentation at Tullie House. The plan now is to designate a public room at Tullie House Museum alongside the CBDC office, housing the Carlisle Natural History Society library, with computer access, microscopes, identification literature, etc.

In a small way, this model (i.e. A Natural History Resource Centre) begins to meet the suggestion mooted in the *Museums Journal Dec 2012* "Create regional biodiversity centres to house natural history collections, libraries, biological records centres and laboratories under one roof."

Dr Teresa Frost (Centre Manager at Cumbria Biodiversity Data Centre, Tullie House Museum): Generating reliable biological records: Local Records Centres and Museums working together with the local recording community

Local [Environmental] Records Centres (LRCs): are "a not-for-profit service run in partnership for the public benefit, which collects, collates, manages and disseminates information."

Generating reliable biological records involves a matrix (with increasing specialization) of citizen scientists, amateur naturalists, professional ecologists and public bodies, including the LRCs and museums, whose expertise in specimens and local knowledge particularly helps with record validation and verification. Outputs include online data, tables and maps, which are used by the public, researchers and those with conservation interests, as well as recording groups and local naturalists, ecological consultants, local authorities and government agencies.

Teresa had sent out a questionnaire to the 60 LRCs in the UK. Most cover one county but some cover several counties or a city region. Forty are ALERC members (Association of Local Environmental

Records Centres, for which Teresa is on the board). All 60 were asked to fill in an online survey on their experiences of museums, and 30 responded. The feedback/conclusions are summarised below:

LRCs probably underestimate how many museums have some biological collections, e.g. in Cumbria the LRC Manager guessed 2, but there are actually 7.

Most LRCs thought there were few curators in their area (except for those with national/regional museums). "Over the past 20 years the Museum service has consistently downgraded Natural History and has reduced staff from 5 FTE down to 1 FTE. This post is currently taken by a geologist and most of the substantial natural history collections are effectively mothballed."

Regarding museum involvement in LRCs today, 12 respondents said a museum played a strategic role in the LRC (hosts/partnership representation), 12 had a non-strategic or no relationship, while 6 had no relevant museum operating in their area and so had nothing to do with museums. There is a need to have a museum person on the LRC, and the LRC can act as an advocate for local museums. We must bring them together – the comments below bear witness to the synergistic value of a close association between LRCs and museums with appropriately curated natural history collections.

Other LRC Comments included: *"The Museum has been our staunchest supporter over the years and we greatly value our link to them. The link to the Museum is thought to account for the continued high volume of data we receive and the relative lack of constraints and demands from local users (the link is perceived to reinforce the neutrality of the LRC)."*

"There have been significant cuts in funding to local museums and as such we no longer have any curators who only deal with natural history although there are several for whom it is part of their remit alongside work with other collections. We make an effort to know who these individuals are and to meet with them informally."

"I used to visit the museum and discuss ID and taxonomic issues. Staff changed and we moved and the relationship stopped."

"We've always been on good terms and we used to have a representative attend our steering group, but he could rarely make it due to time constraints... [Another local museum] held a consultation with interested parties about the importance of the collections and how they can make them more accessible to local recorders and children etc. so they have been engaging with the recording community."

"The museum focuses on the archaeology of the County, completely neglecting natural history, and we now have no contact with them at all. I have been told some specimens were buried in a bunker in the car park, and that the ones that remain are not correctly curated! There has apparently long been the view that natural history is now taken care of by the Wildlife Trust."

"Excellent relationship - the Museums Service also provide much needed meeting rooms for LRC meetings."

With regard to the ability of LRCs to access [digital] data from museums, it was reported that museum staff/volunteers are digitising data and most, but not all, are sharing it with their LRC. In some cases, LRC staff are digitising museum data on behalf of their museum. However, there is patchy access by LRCs to the totality of the museums' data in their area, i.e. historical records whether digitised or not, contemporary records and specimen collections whether digitised or not. Mostly LRCs reported 'none/some' rather than 'most/all'. Some LRCs, like in Cumbria, are making museum data accessible online with one respondent reported that *"there have recently been some talks towards managing public access to the museum's collections records via the NBN on their behalf."*

Regarding LRC Identification/Recording Events, over half the LRCs who offered events said the museum sometimes promoted them**.** 13/24 LRC respondents with an active local museum use museum facilities for events. *"We are starting to build up a relationship, for example our Recorder's Conference will be at the museum in March 2014. We have provided them with leaflets for their events and we're happy to promote them. I think there is much more which could be done, but it's not a high priority right now." "Museum also holds a library of id keys, etc. which are available to the LRC for use in identification sessions".* All the LRCs who knew that the Museum offered relevant events sometimes promoted them. 7/24 LRC respondents with an active local museum said the museum used LRC facilities.

Partnership working is already happening: joint recording events were offered by 10/24 respondents. *"We currently have a strong working relationship with the Museum and are working on a number of joint projects... Any short falls in joint working with any of the Museum is not due to a lack of wiliness but more about a lack of resources, particularly time." " The relationship with the Museum is very good. In the past we have run several joint training projects and large scale survey projects and are keen to develop increased partnership work. "Pembrokeshire Fungus Recording Network (PFRN) in collaboration with WWBIC currently have an exhibition of fantastic fungi photographs from the county at Narberth museum."*

Regarding identification support using **r**eference collections, 18 LRC respondents encourage Museum reference collection use but this is not always easy in practice. *"All of the natural history materials are piled up in a warehouse. We would like to work with Museums Service and volunteers to 'process' this material." "Museum has an old collection of inverts that was in "dis-repair" a number of local entomologist have attempted to save what they can and data that resulted from this has been submitted to the LRC." "There are currently no staff at the museum with a natural history interest or expertise and I do not see that situation changing. We hold some collections here at the Records Centre but they are really for reference purposes. We do not have staff that are properly trained to prepare specimens, catalogue them and manage these collections."*

Regarding mutual assistance in identification, 75% of respondents said their LRC offered an identification service (including passing on queries to local experts); 54% of respondents said the museum offered an identification service but 38% didn't know if the museum did or not.

Regarding voucher specimens in museums, 4 /24 LRCs said they had an arrangement with a museum over the preservation of voucher specimens in support of records. *"We have had many discussions at our steering group and committee for biological recorders regarding the collections and the importance of recorders submitting their collections to them, but I think they have to be selective about what they can take due to available space.." . "If local naturalists ask me what they should do with their collections (e.g. after they die) I have to say offer them to one of the nationals as I cannot say that [Local Museum] would be able to provide appropriate care or access. Having spent nearly 30 years working in a Museum-based LRC, I have been appalled by the decline in Natural History."*

Regarding voucher specimens, whether recorders were encouraged to keep these or to pass vouchers to county recorders, only happens 'sometimes' in 8-11/24 and only 1-3/24 'always/often', while 6-7/24 reported 'rarely/never'.

Teresa went on to consider opportunities for promoting LRC-museum synergies - and the barriers to achieving these, primarily the loss of specialist curators and staff with time to engage with the LRC, leading to mothballing of collections leaving recorders with no access to local reference material, specimens without data, and the disconnection of some museums/curators from recording. Interactions are staff dependent – the best relationships often being where the museum staff are also voluntary recorders themselves. Perception is another factor: museum management may see biodiversity as something done by wildlife conservation organisations (how many museums are on Local Nature Partnerships?), while some LRCs may need convincing that museums are still relevant.

Museums can offer a number of things to LRCs, namely the facility to maintain/improve data quality with specimens (necessarily resource limited but valuable in difficult taxa or proving extensions in range), curators' individual expertise and local knowledge, resources for events allowing wider audiences to be reached. The local research remit of museums may help LRCs resist funder pressure to restrict activities to designated species. And museums have [accessible] data.

In return, LRCs can offer museums the possibility of widening access to natural sciences collections, achieving this through biodiversity data management and dissemination expertise, technical support and services for collections management and exhibitions, making collections accessible online via NBN Gateway (→ GBIF); the data behind collections is especially important for local historic context and trends. LRCs can also facilitate community engagement, through resources and promotion for wildlife recording events and activities. Furthermore, LRCs can assist in collections development, by maintaining engagement with amateur collectors who may later donate their specimens. Museums can also gain access to the local recording network/experts, such volunteer expertise being even more important where specialist curators have been lost. LRCs provide links for the museum to the local biodiversity community, opening doors for wider partnership projects/funding.

Teresa then summarised her personal view of the current situation & opportunities. Whilst recognising resource issues, strong links between LRCs and Museums benefit both parties immensely and are very worthwhile investments of time. Museum representation at LRC partnership/steering group level helps communication and hence joint working, assuming there is a suitable museum candidate. ALERC and NatSCA could encourage this? (ALERC accreditation doesn't require museum engagement as it does local authorities, statutory agencies, conservation NGOs and voluntary recorders.). LRCs are potentially an advocate for the value of museums to biological recording at a local level to local authorities, museum staff, Local Nature Partnerships, etc. It is clear from responses that LRCs and recorders suffer when they lose their natural history collections and curators – could LRCs help stem further losses? Over the past 30 years, as LRC functions have diversified, many have left museums. It is timely to remind ourselves of how closely related the core functions are, with both parties key to generating reliable biological records and supporting local recording. Doing so together is the best way!

Dr John Tweddle (palaeoecologist, not a curator), Angela Marmont Centre for UK Biodiversity: Working with the UK's recording community: examples from the NHM

The Natural History Museum has 250 years of history, being one of world's most comprehensive natural history collections, with >70 M specimens. The NHM is a global biodiversity research institute, with 2-300 scientists generating some 700 papers/yr. It is a major visitor attraction (5M, 250k), and has a long history of working with the UK's recording community.

As an example, John mentioned *Big Nature Day*, held annually, when around 4,000 visitors came to explore the best of British wildlife in and around the Museum. The marquees and Wildlife Garden were packed with over 30 stands showcasing wildlife as diverse as dragonflies, ferns, snakes and insect-eating plants. The Spotty Dotty puppet show attracted lots of the younger visitors with ladybirds and insect friends. Visitors told us the best parts of the day were seeing the wildlife specimens and meeting all the different nature societies. Kids raved about being able to look through the microscopes, touch the snakes and make lots of things.

Examples from the NHM of working with UK naturalists included **c**ollections access and taxonomic support for experienced naturalists. The Angela Marmont Centre for UK Biodiversity promotes recording and provides support and resources for all abilities. Emerging opportunities include the Digital Museum digital collections, web-based tools and social media.

Working with experienced recorders was a tried and tested formula, whereby access to specimen collections was facilitated, so allowing personal learning and identification/confirmation of records. The NHM supports key/regional flora development, provides access to historical specimens, as well as expert advice and support (taxonomic and identification support, collections management advice and

access to literature). There are also joint fieldwork and research projects via membership of recording schemes.

Collections are frequently accessed by the UK recording community, e.g. Coleoptera – several per week, flowering plants – one per week, Diptera – one per fortnight, Earth sciences – less frequently, but with a peak during winter. It tends to be established recorders that visit, often known to curators. Time, enthusiasm, accessibility are key factors in uptake. Around 4000 items/year brought in by the public/recorders are identified at the NHM.

The NHM continues to invest resources in this way because it's what they should be doing as a national museum, caring for and providing access to their collections, demonstrating passion and commitment towards recording. The benefits are many: sharing of ecological and wider natural history expertise, academic debate and joint research projects, as well as collections development (identifications, curatorial support, donations).

The Angela Marmont Centre for UK Biodiversity (AMC): promotes recording and provides support and resources for all abilities from beginner to expert. It is a hub for amateur naturalists, natural history study and collaborative UK biodiversity-focused projects, and is used 2-3x/wk by natural history groups. The Centre provides free workshop space and a meeting room, free personal work spaces, microscope and imaging facilities, a recorder-focused library (incl. LNHS), with access to selected UK reference collections and link to others, as well as identification support and training. During 2012 (soft-launch), ca. 900 visitors came to the centre, ca. 300 accessed collections, mostly beginner-intermediate level, a mix of naturalists, families and artists. The Centre is popular with cross-taxon recorders. It is a meetings venue for 20+ groups and hosted 14 identification training courses in 2012.

Thus, AMC is tackling key issues central to the future of UK expertise, such as how to engage the wider public in natural history science in the UK, how to inspire and develop new naturalists, and how to support the existing naturalist expertise-base. Public engagement is high on the agenda, inspiring the next generation of enthusiasts and promoting biological recording as well as providing an identification and advisory service for UK bio/geodiversity. Getting people's attention first and then getting them involved is the message increasingly visible in Darwin Centre galleries.

The Centre is supporting record quality and data exchange by providing standardised naming for UK biodiversity: there are around 70k spp animals, plants, fungi and single-celled organisms which are found in the UK, and is working together with NBN Gateway, IRecord, Indicia, ISpot and BTO to bring all of the standard reference names for all species of flora and fauna in the UK together in one place: thus far, the **UK Species** inventory has 10-12,000 species standard UK names.

Digital resources are a key part of the future for UK museums. John explained how the Digital Museum represented a fantastic emerging opportunity: collections access has always been a limiting factor but

new technologies are opening up the collections and facilitating skills-sharing with a dispersed global audience. This represents a clear opportunity to support UK recording community and the wider UK taxonomic skills-base. Digitised collections work well for many taxonomic groups, and allow individuals to plan their visits, identify voucher material and extract data, so bringing access for all one step closer.

Another example of digital resources includes *iCollections*: Digitising British Isles Lepidoptera collection, comprising 500,000 specimens in 5,000 drawers, including specimen imaging, complete label information and georeferencing. The average imaging rate 163 specimens/day/person, and 63,000 specimens have been digitised so far – on the way to a virtual UK museum.

Scratchpads are an online virtual research environment for biodiversity, allowing anyone to share their data and create their own research networks. Sites, hosted at the NHM, and offered freely, can focus on specific taxonomic groups, or the biodiversity of a biogeographic region, or indeed any aspect of natural history. Scratchpads are also suitable for societies or for managing and presenting projects. Key features of Scratchpads include: tools to manage biological classifications, bibliography management, media (images, video and audio), rich taxon pages (with structured descriptions, specimen records, and distribution data), and character matrices. Scratchpads support various ways of communicating with site members and visitors such as blogs, forums, newsletters and a commenting system. Facebook and other social media provide another vehicle for interactions between the museum and recorders.

In summary, John emphasized that the NHM is committed to supporting and promoting the UK's recording community within the resource constraints that they operate within. They're aiming for a holistic programme that inspires and supports the development of new naturalists, whilst meeting the needs of existing experts. The AMC and Digital Museum are key components of this approach and supplement traditional routes of collections access.

In the Q&A that followed, the question was raised about the end users of the data – the broader community. Keith Porter said we need to prove to politicians why volunteers are essential and should be invested in – especially to enhance accuracy – so knowledge exchange is key.

Martin Godfrey FLS (Ecological Consultant, Bryologist and recorder): Why Museums Matter

Whole organism biology needed in schools, LRC for undergrads? – there is a lot of education to do.

Museum collections comprise specimens, documents, journals, diaries, maps and ephemera (photos, collecting kit) which are in danger because of the need to make/save money (a shift towards merchandising, shops and animatronics) and the change of role from museum to art gallery, exacerbated by the lack of use once specimens are digitized and records become available on line. So

why do we need to maintain the collections? Digitization is not always effective and online records can be unreliable. Access to specimen data allows critical and objective study, both now and in the future, using new techniques. Collections also provide a teaching resource for students and critical groups.

Martin elaborated on the sort of things that one can find out from collections, such as checking specimens for identity and authenticity, as well as documenting changes in phenology, e.g. egg laying dates as evidence of global warming and why cuckoos are failing to breed. Similarly, because stomata can be used as a proxy for atmospheric co2 content, (the density of leaf stomata decreases with increasing atmospheric CO2), so change can be seen by counting stomata in herbarium specimen, and the time scale can be extended by using plant fossils.

Another example involved herbarium checking for recent Flora project: *Hymenophyllum*, using both herbarium specimens and contemporary documentary material. Specimens of *H. wilsonii* (1844) and *H. tunbridgense* (1909) are found in the museum, both are authentic, but only *H. tunbridgense* has contemporary documentary evidence, while documentary searches indicate that the *H. wilsonii* may be a garden specimen.

The Staffordshire Ecological Record Centre (SERC) values the Potteries Museum in Stoke as the repository of authenticated voucher specimens for more critical records and as a resource to check specimens brought in by the public. It produces ID Guides and has reference specimens.

SERC answers ecological queries from local and national agencies, e.g. Oldacre Valley, Cannock Chase, regarding vegetation, found type-specimen evidence for *Carex dioica.*

Local projects supported include national taxonomic status of the moss *Dicranum leioneuron,* distribution and ecology of slime moulds, county atlas of Tardigrades (with Staffs Ecological Record Centre), and archaeology – support for Staffordshire Hoard exhibition (plant specimens for interpretive exhibit of seed and charcoal finds at Anglo-Saxon village).

There is an ongoing cataloguing project as only about half of the Potteries museum botany collection has been checked and catalogued.

Training is fundamentally tied to specimens. Recent student projects include, at undergraduate level, Diptera, Lepidoptera and help with herbarium preparation, while postgraduate (MSc) projects include Hymenoptera and Coleoptera (Carabidae, Curculionidae , Staphylinidae). Schools Workshops have included the Darwin Anniversary (for 15-16 year olds); Biodiversity (for 10 year olds); Fossils (for 6-8 year olds) . Identification services for the public have included *Tabanus* sp, Bacon beetle and *Russula emetic.*

John Newbould (Yorkshire Naturalist Union President; Secretary of National Forum for Biological Recording): Addressing skills issues in the volunteer recording community: 'Untraditional thinking has a tradition of success'

Firstly you should know a little of my background. For the best part of my working life, I worked as a community pharmacist mainly in Rotherham. I qualified in 1966 with what I considered to be a broad-brush scientific qualification covering many aspects of both the chemical and natural worlds. Professionally we were required to undertake and document 30 hours of **accredited** continuous professional development each year. Part of the CPD involved workshops. Each was composed of a pre-workshop task to introduce the subject, followed by the workshop, which would include direct teaching, structured tasks within a group, followed by discussion. We were then asked to complete a short post-workshop task to demonstrate skills learned probably all earning 6 hours accredited time.

I was introduced to wild flowers as a primary school child, never really losing interest but only starting to record wild plants, in particular, in my early 30s. Holidays on the Norfolk Broads introduced me to the concepts of conservation. It was Joyce Lambert's account of the historical development of the Norfolk Broads outlined in Ted Ellis's New Naturalist **46 –** *The Broads*, which really got me hooked, especially in relation to the ecology of vegetation communities.

Today some 40 years later, I am Secretary of the National Forum for Biological Recording having served on Council for some 14 years mostly involved with administration and organising conferences. I am the 2013 President of the Yorkshire Naturalists' Union having being Treasurer and General Secretary for around 14 years previously and last year was awarded Honorary Membership of the NBN Trust.

NFBR was founded in 1986 as the National Federation for Biological Recording, to promote the concepts of biological recording, to advise on the development of computerised database systems in the days when a PC was not on everybody's desk; to represent the interests of the whole recording community; the volunteers who collected the information, academics who taught biological sciences; museums which in those days not only curated specimens but often acted as a local records centres, This was controversial with some museums e.g. Leeds arguing that such arrangements were detrimental to working on the collections. The users of information, including the national societies and recording schemes and the Nature Conservancy Council including the Biological Records Centre at Monks Wood. NFBR rarely worked alone and was primarily a lobby organisation run by volunteers (albeit some working professionally).

Early successes included:

- The Co-ordinating Commission for Biological Recording working with Sir John Burnett, the Linnaean Society and the Biological Records Centre funded in part by DEFRA. This report developed on the Linnaean Society's 1988 report *Biological Survey – need and network*. In summary the Commission's report concluded that "a phased development of a national system is desirable to meet the present and increasing future demands for reliable biological records and to bring coherence to the present [1994] disparate range of activities.

- Advising on the development of the Recorder database system.
- We were closely involved in negotiations leading to the formation of the National Biodiversity Network Trust and its operating rules and today we have a representative as a founder member on the Trust's Council.
- By the turn of the millennium, most areas of the country operated a local biological records centre with some managed by local authorities, some by wildlife trusts and others as independent charities. Increasingly, their work became related to planning, habitat mapping and reporting on non-statutory sites of nature conservation importance and was becoming essentially contract- based. Particularly those councils who perceived a vested interest gradually weakened the link with museums. As a group, most record centres felt that they needed independent representation and the Association of Local Record Centres was formed out of NFBR in 2009. Many LRCs have links with the volunteer community today but it is not a role for which they are presently being paid. In many instances their financial position is quite tight leaving little room for the extras.

This left NFBR searching for a new role in addition to the annual conference we organise providing a forum for recorders to learn of, and publicise new, developments. During informal discussions with a series of organisations, it was suggested to us since NFBR (as constituted) was not a publicly accountable body we would be unable to seek either charitable, heritage lottery or public funding to continue to develop our role when increasingly professional staff do not have the luxury of fitting in a voluntary role as well. Accordingly, in 2012 we successfully applied to the Charity Commission to become a registered charity and changed our name to the National Forum for Biological Recording at our AGM in April 2013.

I have been asked to address the issues facing the volunteer recording community today. Many of the comments I will make arose in discussions at the NFBR Conference held at the RNLI College at Poole in April 2013, but the views expressed are my own. Difficulties include the reduction in service levels made available by regional Museums, which were often founded all those years ago with the backing of the local natural history society. Coupled with that is the difficulty in organising, peer reviewed mentoring, following a nationally, or even locally organised, training day in the less commonly worked groups especially entomology, conchology, mycology, lichenology and bryology.

NFBR considered the problems facing museum natural history collections at its 2004 conference. It came up with twelve recommendations, which I will distil down to three in the interests of brevity

1. **It confirmed that there has been a serious decline in resources to manage biodiversity collections across the UK, and that this is largely a direct result of the increasing divorce between these collections and the process of collecting and using biodiversity data.**

2. **All biodiversity organisations should seek to promote the links between biodiversity collections and the collection of data, and to encourage collaborative approaches to the funding of collections through formal partnerships with users of biodiversity information.**

3. **The Museums Association and The Museums, Libraries and Archives Council should promote the development of regional/local "hubs" under the "Renaissance in the Regions" programme, especially in relation to biological collections and their use with respect to biological recording.**

The programme of "hubs" and "Renaissance in the Regions" no longer exists. Museums work through a major partners programme funded through the Arts Council for England, which is not necessarily collection-focussed. The Museums Association has been running an Effective Collections Programme, including natural history but these are inevitably relatively small scale and sporadic, funded by the Esmé Fairburn Trust, to assess and review new uses for collections.

Consider the difficulties for an individual who may be a spare time bird watcher and has additionally developed an interest in, say, butterflies and dragonflies. Many such people then become interested in moths. This involves either buying or making a moth trap. Up to £200 may be required. Insect tubes, a net, field guides *etc.* require a further £150. With the internet, finding a local moth group is easy and there is plenty of software available to send records to the local and ultimately the national recording scheme. The new recorder then finds that records for say Grey Dagger are aggregated or rejected because of the difficulty in considering variation of the distinguishing features. Then there is the question of identification of Dagger or Ear moths, both of which require dissection of genitalia. Where do you learn the skills? How much money should the budding moth recorder spend on a microscope? In the 1980s when I started moth trapping, I would go to the Rotherham Museum every week in my lunchtime and check my moths against their extensive collections.

In 2011, the natural history curator at Rotherham, reached 65, was forced into retirement and the service is discontinued. There is nobody to help and mentor the beginner. Elsewhere in Yorkshire, Leeds City Museum service is down to two x half time curators. Halifax Museum disposed of their collections to Leeds. Wakefield just retained the Waterton collection and Kirklees employs a natural historian at the Tolson Museum on 3 days a week, but he has many competing duties. With the biological records centres divorced from the museums, data centres are unable to help with the vexed question of accessibility to collections, although many record centre staff possess excellent taxonomic skills in invertebrate identification. Leeds has a modern world class Discovery Centre paid for by public funds easily accessible by train.

Is there a solution to the financial crisis facing many local museums? Perhaps there is. Let us assume that the on cost for a museum curator is around £40k p.a. Divide that by five local authorities in West Yorkshire would be £8k each. There is a good train and bus service to Leeds with many pensioners able to use the free travel pass and an excellent service could be offered especially by recruiting local retired experts to help with curating, identification *etc.* The size of the present Discovery Centre in Leeds is inadequate as a main base for the West Yorkshire Region, never mind Yorkshire as a whole. However, the space is available on the council-owned site to produce a much larger regional or county-based facility if this is required. For such a service, a great deal of investment would be required but could be justified if the service used its facilities for training and mentoring regional field naturalists.

"In its evidence to the Culture Media and Sport Select Committee, the Museums Association drew attention to the high fixed costs that museums have for operating and maintaining complex and often listed buildings and caring for often large reserve collections. Cuts to revenue funding, said the MA, risk having a disproportionate effect on front-line services.

The evidence highlighted public funding cuts at both national and local level, a decline in support for regional museums following reductions to Renaissance in the Regions, and the loss of other funding streams that were helpful to independent museums.

It also noted that ministers for the Department for Culture, Media and Sport refused to acknowledge that public funding cuts were having a severe impact on service delivery, dismissing concern about the impact of cuts, with the Secretary of State complaining that she is frustrated by the sense of 'perpetual gloom' about the future of the cultural sector."

Such amalgamation of staff into one authority has saved my local Councils (Weymouth and Portland working with West Dorset) many millions of pounds across the whole range of services and we have not noticed a reduction in service levels. Why has this not happened in Leeds with its museum service? In West Yorkshire the subject of amalgamated services and storage facilities has been raised many times over the years, but at least one Council says, "If it does not happen in our district, we will not fund it". You may say, "Well who could apply leverage?" Surely the Department of Media Culture and Sport should apply pressure to ensure value for valuable expenditure from previous years. However, in view of the Secretary of State's comments reported above, perhaps the Department should be abolished to invest money in front-line services.

The point, I wish to make is that if the volunteer is prepared to invest both time and cash into supporting the recording of biodiversity information; surely the wider society has a responsibility to provide some accessible support.

Secondly, I wish to address the issue of training and could regional museum natural history departments become more high profile if they became involved? However, classrooms are disappearing to earn money. Professionally Charted Institute of Ecologists and Environmental Managers are beginning to accredit degree courses. This is a welcome development used by many other professional bodies. There are many organisations offering biodiversity related training but how much of that training is delivered by people who can communicate and how accessible is the training provider? In the business pages of the *Daily Telegraph* of 10th July 2013, Allister Heath asks, "When will teachers change their ways?" He reported that teaching has changed little since the 19th century with teachers standing in front of a class and delivering a planned lesson, with students taking notes, doing assessments aiming to sit exams at a set time of the year. He claimed that there is no systematic use of the internet or of software or gaming technology to aid learning with no proper data analysis to monitor students' progress, no economies of scale or productivity gains. Governments constantly interfere with the national curriculum, as this is a political agenda all can speak to. Can we use the world class resources held in our national science museums to teach natural history identification skills

electronically? The Open University has such courses using Ispot but I have not invested in such a course to test the concept.

I have been on recent training days. One such course, involved the inevitable powerpoint presentation. We could not take it away, nor were any printed pages provided. We then wandered off into the field, where twelve or so people are shown species, have them named, perhaps an identification point highlighted but no systematic provision of samples to take away for future reference or for the student to try out the keys to confirm the identification.

We sorted that out for one group by setting up a beginner's bryophyte-recording group where people were given the basic instruction in collection, preparing a sample and use of keys and other resources to confirm identification. Generally we found that in a group of eight to ten people we could agree a correct identification and understand how we arrived at the solution. With luck, such a group can meet where there is Internet access to visit recording scheme websites for advice. However, this may involve students in some cost. We can hire a village hall in Dorset for around £5-8 per hour or with even more luck, we can find a National Trust classroom and beg free use, as we will be actively recording for one of their properties. My colleague Dr Mike Edwards from Dorchester commented "Training the trainer is really important, but also training students in transferable skills (how to use keys, how to curate whole specimens, how to dissect parts of specimens and prepare slides, stain material etc.) in parallel with specifics (such as 'how to identify species X using this one key that I have provided you with today'). Providing ongoing mentoring is really important too. Mentoring needs to be both indoors (preparation - curation and correct identification), and outdoors. Field skills cannot be fully taught in a classroom. Students need to be acquainted with the quarry's biology & ecology if they are to catch something and record it."

We have also attended three, Field Studies Council training days. On two occasions, the people who taught us had an international reputation in lichenology (excellent teaching was let down by students not having access to the initial Powerpoints after the formal teaching). We did receive a basic hand-out, which would have made a good pre-workshop task. The microscopes were quite old and tired and on one occasion the identification guides were the basic FSC charts. One major problem with lichenology is the absence of good keys. We were provided with reagents on one course, although we had taken our own. The courses involved travelling for around 2 hours so we ended up with an eleven-hour day. Once again, we have still to address the issue of post training mentoring. On a third recent course, the tutor happily gave us the powerpoint (with the usual copyright provision). This has enabled us to reflect on the material presented at leisure with reference books available to reinforce the points made. We were given a small pre-workshop task. It was to bring some material to work on, but only two of us achieved that. The pre-workshop task actually resulted in the addition of six or so more species to a well-worked site.

Within the Yorkshire Naturalists' Union, we offer Leeds University MSc students' field skills training. We ask each of them to do a pre-workshop task of around 90 minutes. Many do not do the task as they claim to be too busy with essays, etc. Those that do the task are the outstanding students of our training day. Could I recommend *Science in the countryside* by Margaret Pilkington published by the National

Council for Adult Continuing Education? The pharmacy CPD model uses the techniques outlined in her book.

There are some excellent training providers. Stuart Ball and Roger Morris both give up around twelve weekends a year to train potential Hoverfly recorders. They bring along a microscope for each student together with sufficient specimens for students to work on the same species together. The cost of this training is £30 per student, which just covers their costs. However, Roger Morris believes that probably just one out of twelve students actually goes on to become a serious hoverfly recorder submitting around 500 records annually to the national recording scheme. The British Entomological and Natural History Society, mostly at Dinton but also at the Angela Marmont Centre also organises numerous training courses. Here one of the biggest problems is that delegates occasionally leave the course without access to identification keys.

In summary:

- Identify key training providers who will deliver sustainable packages using the internet and Irecord to verify work.
- Work towards providing an accreditation system of training even for volunteers.
- Press the Department of Media Culture and Sport to ensure that regional museums with important natural history collections are adequately funded and staffed and are open to the public on 250 days a year, free of charge.
- Ask the Field Studies Council to investigate ways of working with the National Trust to provide nationwide local training bases.
- Develop, using local museums and natural history societies, a register of mentors working near home.
- Field Studies Council to be asked to develop 'Training the Trainers' modules for the voluntary sector.

Trevor James, NBN Trust Advisor: Biodiversity data in the NBN – the drive for data quality

Trevor opened his presentation by asking What exactly is a biological record? What, where, when, who? Figments of imagination?! Or measurable abstractions? He likened the pursuit of recording to herding cats - the initial paradigm of field recording, databasing and identifying now had new elements in the mix : the Worldwide Web (or virtual anarchy?) as well as digital recording devices (cameras, smartphones, scratchpads, etc) with wireless connectivity. Nevertheless, voucher specimens are important – need specimens to check.

The NBN approach was summarised in NBN Data Guidance: Improving wildlife data quality. http://www.nbn.org.uk/Tools-Resources/NBN-Publications/NBN-16-Improving-Wildlife-Data-Quality.aspx. Progress continues with the launch of NBN Record Cleaner (V1.0.8.4 was released Feb 2013) a free software tool to help people improve the quality of their wildlife records and databases. Other software tools currently available to recorders include Recorder 6, a powerful,

standards based tool for collection and collation of biological recordings which includes data entry, reporting and distribution mapping functionality, while MapMate is designed to record, map, analyse and share natural history sightings, and Species Recorder is a biological recording tool intended to make entering records quick and simple – a data input interface. Looking to the future, other initiatives include iRecord, the goal of which is to make it easier for wildlife sightings to be collated, checked by experts and made available to support research and decision-making at local and national levels.

NBN Gateway, at 17th August 2013, had 89,925,498 records. The question remains: how many of these records are validated by a specimen? And that's where museums fit.

There followed a breakout session, with two groups considering

- **What can we do to promote museum use: Chaired by Martin Godfrey**
- **The need to improve links: Chaired by Paolo Viscardi - National Science Collections Association**

Breakout session 1: What can we do to promote museum use?

- **To Promote Museum Use to Biological Recorders**

- Produce a good on-line catalogue
  - Listing of specimens
  - Those available for 'training'
  - Consider images – eg Herbaria at Home
- Consider non – standard resources
  - Diaries and field journals
  - Drawings of specimens
- Promote links to specialists
  - Local recording societies
  - Local branches of national wildlife organisations
  - The county recorders
- Provide the narratives
  - Local specialisms
  - Citizen science projects
- Access – a key phrase:
  - Physical collections available for biological records, inspiration, research, etc
  - Developing keys, and facilitating research
  - Not just providing access, but advertising access

- There are access difficulties in some cases where potential users are rebuffed from using museum collections because of lack of staff or lack of awareness of natural history collections held.

- The location of museums are not always convenient for users – services offered in South Kensington are unlikely to be taken up by recorders from Preston

- Many potential users are unaware of what collections are held where, and thus never think about going to their local – or any other – museum to look at collections that match their interests – needs access to catalogue information to inform decision on whether and where to visit.

- Little recognition of the professional market for local collections – eg the records hold valuable material for biogeographers and modelers, but rarely promoted in this way (comments from academics).

- No recognition of the concept of a 'national collection' therefore little incentive to maintain local collections if they are seen as unimportant for anything beyond local interest.

- Rarely any real relationship with the recording community of enthusiasts who collect specimens and are likely to be interested in looking at reference collections, depositing voucher specimens and bequeathing collections, etc.

- Local museums can provide skills, facilities and expertise into the recording community that would allow the issue above to be addressed.

- The large number of small local collections and museums deters potential government funders from engaging – too many and too variable set of issues and centres. Mileage in exploring regional hubs where collections could be brought together and services rationalised and improved – with build in of stronger links to recorders and data centres.

- The links between local museums are often lacking – eg peripatetic curators and sharing of skills and capacity etc.

- Regional coordination of these services is lacking

- The funding model would perhaps work better if split between the Arts and Sciences – this would give dual funding model that could give a better balance?

- Need good 'stories' on the value and role of local collections and museums that can be used to raise awareness and garner future support; this is not simply using old purposes and arguments that patently are not working.

- Use the evidence of what is working with the Angela Marmont Centre to stimulate this model being adopted elsewhere – with further development of AMC to look at outreach and support for regional networks (eg – helping establish reference collections for local recorders by provision or sourcing of specimens).

- Unfortunately Natural History Collections are Science not Arts. The fact that museums are funded through the Dept of Media, Culture and Sport and not within the Science division of the Department of Trade and Industry is always going to mean that natural history is a very poor relation the Arts graduates who are involved with running Media, Culture and Sport. As one delegate pointed out the arts people have different terminology in their meetings.

Breakout session 2: The need to improve links: Chaired by Paolo Viscardi - National Science Collections Association

The question of purpose was addressed to the meeting

- **Museums want to be used and Recorders want to use museums**

What could be done to increase usage?

  - Lobbying local museums to get natural history collection back
  - Demonstrate active interest in collection through increased requests and use
  - Media involvement
  - Funding

It was recognised that museums have responsibilities in maintaining collections and ensuring effective use of a valuable resource including:

  - Type specimens to ensure taxonomic rigour
  - Voucher specimens to confirm variability and identification and support training and education
  - Data to support research to inform decision makers
  - Display and Events to promote education and understanding.

Discussion: Improving Links

- **Who should be made aware of the growing need to use our collections?**
  - The LRCs through ALERC
  - As many museum collection managers as possible – through NatSCA
  - Councils
  - Universities – not all will be members of NatSCA
  - Consultancies where collections are kept
  - Biological recording groups eg BSBI/Butterfly conservation/Dipterists Forum/ Yorkshire Nats Amateur Ent Soc BENHS etc
- **What options could be explored acting nationally and locally to increase access**
  - Sharing collections-based work and how research has given data on big issues like climate change, pesticides, disease spread etc
  - Consider and evaluate models: The big network? Regional hubs? What is likely to work? Case study those models that are working eg Tullie.
  - More funds were considered unlikely without more linked up vision/goals?
  - Seeking mechanisms to encourage LRCs participation in museum steering groups and vice versa
  - Building an evidence base for funding applications is required which would include volunteer efforts (what would it cost?) i.e. evidence of amount "spent". This should include
    - Evidence of need for biodiversity information
    - How those needs are currently fulfilled and what part LRC/Museums/private and commercial collections and universities play
- **What First steps should we be taking towards improving communication**
  - Set up a list of collections available – NatSCA have started this and aim to continue (a similar exercise was undertaken by the then BCG in the late 1980s; a massive report was produced , which went so far as to list in order of 'quality' and 'activity' level all the museum natural science collections throughout the country)
  - Build on FENSCORE (The Federation for Natural Sciences Collections Research)
  - Share this information with the biological recording community
  - Write up a case study eg Tullie House model – It would be good to start with those museums that already have some potential and interest to build precedent and set a national example
  - Consider the concept of 'hubs' of interest.
  - Encourage universities, consultancies and other private collections to consider promoting their material for use by local recorders.
  - NBN will be highlighting collections related datasets to inform recorders use and link data to specimens to better enable verification.
  - Circulate a contact list of the people in this room
  - Convene a meeting in a year's time to share progress

What should we be aware of and consider:

- There are good links within taxonomic groups (moths, birds, etc.). There many non-active 'armchair members' but newsletters/members mags etc exist. Local record centre is a good way to get in touch with various taxonomic specialist groups, etc. Other channels include the recording society, natural history groups and the wildlife trusts.
- Find out who organises groups and how can we reach them eg through recording society (taxon interest group, consultants groups, fishing and shooting societies)
  - List of contacts with NHM, but lots of volunteers and variation in group structures/sizes (herding cats!)
- The best way informing advisors of ministers? How do we tell parliament with one voice – a grand challenge!
- Consider how the Linnean Society can help. Can a learned society lobby more effectively to stress museums and other resources for lifelong learning eg libraries.
- Could we get a National level statement of value of natural history collections from biological recorders, backed by NHM, Linn Soc, etc.
  - What are needs of specialists, etc?
  - Develop national narrative?
- Is there scope for an ecosystems-based virtual meta-museum which encapsulates disparate collections? Mapping the co-ecology?
- Involve the commercial biological recording sector
    - Some have collections, professionals keen to link with volunteers and museums
    - Should be invited to join NatSCA to help build links across the sector
    - Should be encouraged/helped to submit records to their LRC
    - Importance of awareness of commercial world and use, particularly for lobbying perspective
- Academic aspects – there are collections especially herbaria within many universities collections, but often little or no contact with local recorders possibly due to perceived barriers to access that don't exist?
- Be aware of the vicious circle – when there is nobody qualified to respond on behalf of museum once contact is attempted – seek ways of promoting use – copy in senior managers to ensure they are aware of the need – and turn the circle into a virtuous circle. Even if there is not point of contact – it is important to demonstrate need and copy in local government with any request for information
    - Less expertise -> less useful/accessible collection ->considered less important ->discarded
    - More expertise ->better data and support ->valued by recorders esp LRC ->integrated used
- Promote awareness and put collections back on recorders agendas where possible. Eg adoption scheme through local NH society or LRC to take up a greater role in struggling/underused collections
    - Record usage of collections
    - Trial and produce case studies?

    - Externally funding projects? HLF, etc?
- Invasive species or disease that demonstrate valuable information share as case studies
    - Ash?
    - Ghost slug – records from amateurs finding them at night, NH collection made discovery, tracked spread, etc
- Multidisciplinary museums, pitch enquiries as high up the tree as possible to make awareness of demand they may not be aware of and are catering for
- Spread info about what collections hold to enable requests, interest, etc
    - List specialisms and types and ask others for help eg BSBI herbaria list?
    - Accessibility – so many ways of recording and sharing info -> no central resource
- NH society members survey pilot study from NHM in the London area
- Ongoing mentoring and resources, need regional hubs to support beyond one days

Discussion: Priorities for Museums

Access:

- Physical collections available for biological records, inspiration, research, etc
- Developing keys, research, facilitating research
- Not just providing access, but advertising access

- Link up within those attending meeting with some info about who and with contacts
- No register of national records, how do you know competence, accreditation, etc?

<u>Comments received from people who were unable to get to the meeting</u>

Steven Falk BSc FRES Entomologist (Invertebrate Specialist)

When I left Warwickshire Museum in 2011, I was the last full-time, qualified Keeper of Natural History in the entire West Midlands museum sector, an area rich in wildlife, wildlife enthusiasts/recorders, and important (and highly vulnerable) natural collections. Many other regions have lost most of their natural history experts – the loss within this sector far outstrips loss of social historians, geologists, archaeologists etc. quite a surprise given that natural history is often one of the most popular disciplines in a museum and usually achieves so much outreach.

Some time before I departed, I flagged to the Head of my service (who sits on the regional curator's group) that the region was losing all its nat hist expertise. It was never raised as an agenda item on that regional group "oh they don't talk about stuff like that". My conclusion was/is that museums are as much a threat to themselves as any external pressures – with many museum managers lacking understanding of natural history or environmental issues.

Most LRCs started life in museums, overseen by natural history curators. Many of the specimens, and much of the paperwork underpinning datasets resides in museums. The expertise required to keep datasets to a high quality traditionally revolved around museums. Museums that possess LRCs or ecologists (Warwickshire Museum still employs a team of ecologists, albeit in another building) can truly claim to help shape the world around them and few other museum disciplines can match that potential. We need to get natural history expertise back into museums and link museums to biological recording, the planning system, LBAP work, enviro' education etc, etc.

Herbarium comments from BSBI members

Paul Ashton Edgehill University

Herbarium use:

Yr 1 UG prac on Biodiversity module is visit to local herbaria to do two things; see extent of collection plus an exercise that gets them examining specimens to consider distributions, age of specimen and importance of correct and full record collection.

Yr 2 UG Placement is often at local herbaria and /or invert collection

Awareness in yr 1 sees students use them as a resource as part of Yr2 Field Botany module. Invert collections used in Invert Ecol Yr 2 module

Yr 3 herbaria have been used in dissertation work

We have one ex student now a curator at Liverpool World Museum

Chris Metheral Botanist – BSBI recorder

Our herbarium, at HAMU reopened last year after being closed for rebuilding for about four years. As a side issue the storage itself is far too small, particularly after receiving the University herbarium and George Swan's collections earlier this year. John Richards and I put together a working group to get the files into the right order, which has at least been achieved, but the main problem seems to be that there is only a single technician/curator for all the collections - paleontology, anthropology, archaeology, etc. etc. And, poor chap, he's run off his feet. However there is workroom space for workshops and so forth and having got to know him quite well I hope that something can be sorted out over the winter so that the various collections can be amalgamated thus increasing their usefulness.

Having run a fair number of botany courses by now my overwhelming impression is that people do not use herbaria enough. Most of my students are amazed that they can use them at all! I encourage them as much as I can and I know that one or two have been along in the winter with their floras and worked through some keys with the plants in front of them. Hooray!

And, with my own hat on, writing the *Euphrasia* handbook would be quite impossible without the help of various curators. As a for instance, I was in the SLBI earlier this year and discovered that, as far as I could tell, no-one had cast an eye over the *Euphrasias* since Pugsley in the 1930s, and I was able to discover at least one type specimen believed to be lost. Who knows what else is there.

Mick Crawley Imperial

The locations of herbarium might also double as meeting places for local BSBI training activities.

Louise Marsh BSBI

Richard Gornall has achieved some synergy in VC55 - the Herbarium and the Bot. Garden are where the local BSBI group runs workshops and holds indoor meetings, and the herbarium vols are all drawn from the local group.

Paul Green. As BSBI Acting Welsh Officer

I use the Herbaria at National Museum Wales a lot for my work. Often check the specimens before I go out to survey a rare Welsh species to see if any extra info on the sheet to help me find the plant.

Used the *Polypodium* specimens when I ran a workshop for the BSBI in March at the National Museum

Wales. Usually pop into Glasnevin, Dublin several times a year to extract info on Wexford.

Mark Duffell – working on the records for Shropshire – BSBI volunteer and freelance ecological consultant.
Carried out a project on extracting records from herbaria. At the end of the collection stage there are 3688 biological records, from3611 voucher specimens. A comparison of known records for Shrewsbury Herbarium showed that this project has increased the number of known records by 90%. The first voucher specimens in the herbarium dated from 1809 and the last in 1963, a span of 154 years, with the most prodigious recorders being Leighton, Painter and Rutter. Records were made by 73 recorders, of which one, John Clarence Jinks, was previously unknown, creating 87 records for the years 1910 to 1912, an under recorded period in Shropshire. Most material came from within Vice-county 40 (Shropshire) and the surrounding vice-counties, but also included material from West Cornwall (VC1) to the Orkneys (VC 111), a total of 30 Vice-counties in all. There were several records from Ireland, France and, Denmark. Out of these records a total of 90 species of threatened plants (BSBI 2006) were recorded, and include a potential type specimen (*Fumaria painteri*) and, confirmation of the historical existence of *Carex diandra* in Shropshire (previously lacking voucher specimens).
Time 120 hours for 3688 specimens; 240 hours verification i.e. 360 hours work for the whole collection.

FSC Biofells
Beetle course - Don Stenhouse Access Officer at Bolton Museum
The collection is well used by the recorders who visit the museum for verification and the museum seems to be one of the important ones in the North - notwithstanding Liverpool and Manchester. There seems to be priority for historic non-natural history collections as these sometimes generate income from being 'on-tour'

Geoffrey Hall
I was made redundant from my post as Natural Life Curator (Botany) in 2012 and, following the departure of the Senior Curator, there is no longer anyone at Leicestershire County Council's museum service with any knowledge of the natural life collections. I have been told that the Senior Curator post will be filled, but not necessarily by anyone with natural history experience. Consequently, I believe that the collections are now vulnerable to rationalisation because of a new round of Govt. savings.

Acknowledgements

The Linnean Society is deeply indebted to Sue Townsend, Biodiversity Learning Manager at the Field Studies Council, for her considerable energy and enthusiasm in pulling the Plenary Programme together and for so ably chairing the meeting, strongly supported by Keith Porter (Natural England) who injected some realistic points on potential funding, models for collaboration and considerations on the biological perspective from Natural England and DEFRA. Thanks also to the co-chairs Paolo Viscardi, representing NatSCA, and Martin Godfrey for skilfully pulling together the varied contributions from the afternoon discussions. Thanks also to Paolo for tweeting effectively, well beyond the meeting attendees. And, of course, sincere thanks to all the speakers for their thought provoking presentations, and to the participants for their excellent discussion points.

Registrants for The Role of Museums and Collections in Biological Recording 18.09.13

Title	First Name	Surname	Institution
Dr	A. Martyn	Ainsworth	RBG Kew
Dr	David	Allen FLS	
Ms	Gail	Austen-Price FLS	DICE
Dr	Justine	Aw	NatSCA
Professor	Sam	Berry PPLS	University College London
Dr	Geoff	Boxshall FLS	Natural History Museum
Dr	Catherine	Burton	Surrey Biodiversity Information Centre
Dr	Agneta	Burton	University of Hertfordshire
Dr	Oliver	Cheesman	Natural History Museum/Invertebrate Link (JCCBI)
Dr	John C B	Clennett FLS	RBG Kew
Miss	Joan	Cramphorn FLS	
Mr	Oliver	Crimmen FLS	Natural History Museum
Professor	David	Cutler PPLS	Chair of the Linnean Society Taxonomy and Systematics Committee
Mr	Richard	Davey	
Miss	Emma	Delduca FLS	Marine Ecological Surveys Ltd
	Russell	Dornan	Horniman Museum and Gardens
Professor	Dianne	Edwards PLS	Cardiff University
Mr	Aljos	Farjon FLS	RBG Kew
	Teresa	Frost	Cumbria Records Centre, Tullie House, Carlisle
	Isla	Gladstone	Bristol Museums, Galleries & Archives
	Martin	Godfrey	Ecological Consultant, Bryologist and Recorder
Dr	Brian	Harding FLS	
Dr	David	Harris FLS	Royal Botanic Garden Edinburgh
	Martin	Harvey	Biodiversity Observatory - Research Assistant
Miss	Jo	Hatton	Horniman Museum and Gardens
Mr	Colin	Heart	
	Steve	Hewitt	Tullie House, Carlisle
	Simon	Hiscock FLS	University of Bristol
Mr	John	Holden FLS	
Mr	Tom	Hunt	Association of Local Environmental Records Centres
Mr	Charles	Hussey FLS	
Dr	Robert	Huxley FLS	Natural History Museum
Dr	Eeva	Ingelog Lakomaa	Friends of Linnaeus Hammarby
	Trevor	James	NBN Trust
Mr	Richard	Jones FLS	
Dr	Stephen L.	Jury FLS	University of Reading
Dr	Sarah	King	York Museums Trust

Dr	Francine	Kurzawe	Royal Holloway
Mr	Brian	Livingstone FLS	
Ms	Miranda	Lowe	Natural History Museum
Mr	Roy	McCormick	
Miss	Laura	McCoy	Leeds Museums & Galleries
Mr	John	Millar FLS	
	John	Newbould	NFBR
Mr	Martin	Noble	
Mr	Troy	Nurse	
	Keith	Porter	Natural England
	Joanne	Porter FLS	Heriot Watt University
	Julie	Reynolds	Natural History Museum
Dr	Elizabeth	Rollinson	Linnean Society of London
Dr	Ben	Rowson	Amgueddfa Cymru - National Museum Wales
	Malcolm	Scoble FLS	
Dr	Robert	Scotland	University of Oxford
Dr	Lindsay	Seiderer	Marine Ecological Surveys Ltd
Dr	David	Simpson	RBG Kew
Ms	Mary	Spencer Jones	Natural History Museum
Dr	Alan	Stewart	University of Sussex
Ms	Jenny	Streeter FLS	
	Marc	Taylor	
Dr	Nikky	Thomas FLS	Harrison Institute
	Sue	Townsend	Field Studies Council
Dr	John	Tweddle	Natural History Museum
	Paolo	Viscardi FLS	Horniman Museum, NatSCA
Dr	Rachel	Webster	Manchester Museum
	Sarah	Whild FLS	
	Steve	Whitbread	
Dr	Christopher	Whitehouse	Royal Horticultural Society
Dr	Michael	Wilson FLS	Museum of Wales
Mr	Tony	Witts	Kent and Medway Biological Records Centre
Dr	Jonathan	Clark	University of Surrey

Post meeting note: things are moving on also with the **Scottish Biodiversity Information Forum**. They have produced a new document, the **SBIF Action Plan**, with their priorities outlined, which may be of interest for the Taxonomy and Systematics committee. Dr Joanne S. Porter at Heriot-Watt University has details.